KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1956)
Coimbatore – 641 021.
(For the candidates admitted from 2016 onwards)
DEPARTMENT OF COMMERCE (CA)

Syllabus **Semester 5**

	L	T	P	C
16CCU501A				
SOFTWARE DEVELOPMENT WITH VISUAL BASIC	4	-	-	4

SCOPE : Software Development with Visual Basic enables the students to understand the basis of VB application, Variables, Active Data Object, and the aspects of reporting. This helps to understand the phases of software development

OBJECTIVES:

- To enable the students to develop a front end tool for customer interaction in business.
- To make the student to develop an application using Visual Basic.

UNIT- I

Introduction to VB – steps in VB application – Project Explorer Window – Property Window – Form Layout – Code Window – Event driven programming – Working with Forms.

UNIT-II

Variables – Constants – Literals – Data Types – Operators – Sub routine and Functions Programme Flow Control – String function – Numeric function – Date function.

UNIT-III

Pointers – Label – Frame – Check Box – Compo Box – Scroll Bar – Timer – Shape and Line Control - Command Button – List Box - Image Box - Picture Box – text Box – SDI and MDI form – Data Grid - Flex Grid – Menus – Dialog Boxes.

UNIT-IV

DAO – Creating a Data base – Types of Record set – ActiveX Data Object (ADO).

UNIT- V

Data Report: Data Environment – Designer – Connection object – Command object – Data Report control – Sections of Report designer. Case Study: Automated system for student mark list – Automated system for Railway reservation.

Suggested Readings:

Text Book*:*

1. Gary Cornell. (2005). *Visual Basic 7 from the Ground up* [3rd Edition]. New Delhi: Tata McGraw Hill

Reference Books:

1. Content Development Group(2012). *Visual Basic 7 programming*. New Delhi: Tata McGraw Hill.

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Coimbatore – 641021.

LECTURE PLAN
DEPARTMENT OF COMMERCE

STAFF NAME: R.BHUVANESWARI
SUBJECT NAME: SOFTWARE DEVELOPMENT USING VISUAL BASIC
SUB.CODE:15CCU501A SEMESTER: V CLASS: III B.COM (CA)

S.No	Lecture Duration Period	Topics to be Covered	Support Material/Page Nos
UNIT-I			
1	1	Introduction to VB	W1, W2
2	1	Steps in VB Application	T1: 1 – 19
3	1	VB IDE Explanation	W2, W3, R1
4	1	Project Explorer Window, Properties Window	T1: 33 – 45
5	1	Form Layout, Code Window	T1: 63 - 83
6	1	Event Driven Programming	T1: 83 – 89
7	1	Working with forms	T1: 90 – 94
8	1	Sample VB Program	W3
9	1	Recapitulation and Discussion of Important Questions	
Total No of Hours Planned For Unit 1=9			
UNIT-II			
1	1	Variables, Constants	T1: 150 – 152
2	1	Literals, Data types Declaration of variables and data types Giving length and values for variables	T1: 155 – 168 R1:170 - 178 W1, W2
3	1	Operators, Types of operators	T1: 176 – 180

4	1	Sub routine and functions Function Definition Call by Value and Call by Reference	T1: 193 - 200 W2 W3
5	1	Program Flow Control Control Statements, Looping Statements Unconditional Branching Statements	T1: 219 -254 W1 W2
6	1	String Function	T1:255 – 270
7	1	Numeric Function	T1: 285 – 287
8	1	Date Function	T1: 288 – 290
9	1	Sample Program	W2
10	1	Recapitulation and Discussion of Important Questions	
Total No of Hours Planned For Unit II=10			
UNIT-III			
1	1	Pointers, label, frame, scroll bar	T1: 122 -124
2	1	Check box, Combo box, Timer control	T1: 107 – 110
3	1	Shape and line control	T1:112 – 116
4	1	Command button, list box	T1: 120-135
5	1	Image box, picture box, text box	T1:120-135
6	1	SDI and MDI Form	T1:120-135
7	1	Data Grid, Flex Grid	T1:140-155
8	1	Menu, Dialog Boxes	T1:140-155
9	1	Sample Program	W3
10	1	Recapitulation and Discussion of Important Questions	
Total No of Hours Planned For Unit III=10			
UNIT-IV			
1	1	DAO – Introduction	T1:230-232

2	1	Creating a Data Base	T1:233-235
3	1	Working with Data Base	T1:236-240
4	1	Types of Record set	T1:240-243
5	1	ActiveX Data Object(ADO)	T2:300-321
6	1	ActiveX Data Object (ADO)	T1:256-300
7	1	Sample program	W3
8	1	Recapitulation And Discussion Of Important Questions	
Total No of Hours Planned For Unit IV=8			
		UNIT-V	
1	1	Data Report: Data environment, designer	T1:405-410
2	1	Connection object, Command object	T1:410-15
3	1	Data Report control	T1:420-423
4	1	Sections of report designer	T2:450-455
5	1	Automated system for student mark list	W2,W3
6	1	Automated system for railway reservation	W2,W3
7	1	Recapitulation and Discussion of important Questions	
8	1	Discussion of Previous ESE Question Papers.	
9	1	Discussion of Previous ESE Question Papers.	
10	1	Discussion of Previous ESE Question Papers.	
11	1	Discussion of Previous ESE Question Papers.	
	Total No of Hours Planned for unit V=11		
Total Planned Hours			48

TEXT BOOK

1. Gary Cornell. (2005). *Visual Basic 7 from the Ground up* [3rd Edition]. New Delhi: Tata McGraw Hill

Reference Books:

1. Content Development Group (2012). *Visual Basic 7 programming.* New Delhi: Tata McGraw Hill.

<u>WEBSITES</u>

W1: https://www.freetutes.com/learn-vb6/

W2: https://www.tutorialspoint.com/vb/

W3: https://docs.microsoft.com/en-us/.../visual-basic/

UNIT-I

SYLLABUS

Intoduction to VB – Steps in VB Application – Project Explorer Window – Property Window – Form Layout Window – Code Window – Event Driven Programming – Working with forms.

Introduction of Visual Basic

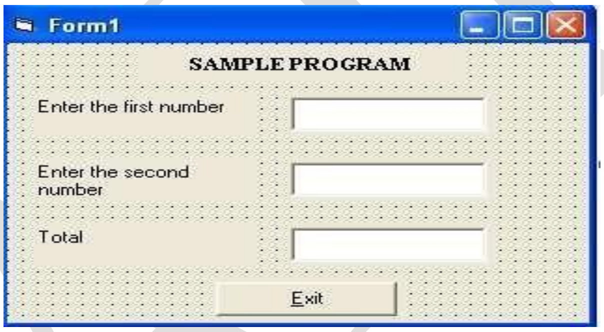
VISUAL BASIC is a high level programming language which evolved from the earlier DOS version called BASIC. BASIC means Beginners' All-purpose Symbolic Instruction Code. It is a very easy programming language to learn. Different software companies produced different versions of BASIC, such as Microsoft QBASIC, QUICKBASIC, GWBASIC, and IBM BASICA and so on. However, people prefer to use Microsoft Visual Basic today, as it is a well developed programming language and supporting resources are available everywhere. Now, there are many versions of VB exist in the market, the most popular one and still widely used by many VB programmers is none other than Visual Basic 6. We also have VB.net, VB2005, VB2008 and the latest VB2010. Both Vb2008 and VB2010 are fully object oriented programming (OOP) language. VISUAL BASIC is a VISUAL and events driven Programming Language. These are the main divergence from the old BASIC. In BASIC, programming is done in a text-only environment and the program is executed sequentially. In VB, programming is done in a graphical environment. In the old BASIC, you have to write program code for each graphical object you wish to display it on screen, including its position and its color. However, In VB, you just need to drag and drop any graphical object anywhere on the form, and you can change its color any time using the properties windows. On the other hand, because the user may click on certain object randomly, so each object has to be programmed independently to be able to response to those actions (events). Therefore, a VB Program is made up of many subprograms, each has its own program code, and each can be executed independently and at the same time each can be linked together in one way or another.

What is Visual Basic and need of visual basic?

Visual Basic is a tool that allows you to develop Windows (Graphic User Interface - GUI) applications. Basic denotes method of writing programs code functionality.

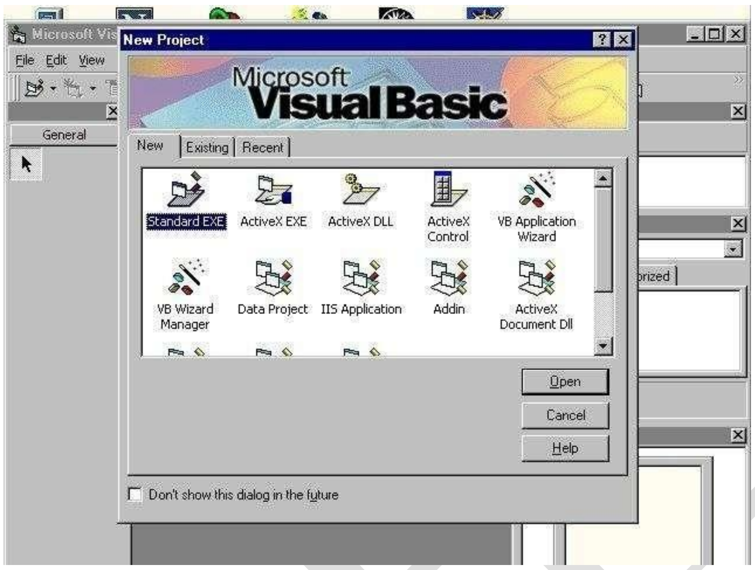
Visual Basic is event-driven, meaning code remains idle until called upon to respond to some event (button pressing, menu selection ...). Visual Basic is governed by an event processor. Nothing happens until an event is detected. Once an event is detected, the code corresponding to that event (event procedure) is executed. Program control is then returned to the event processor.

Getting Started

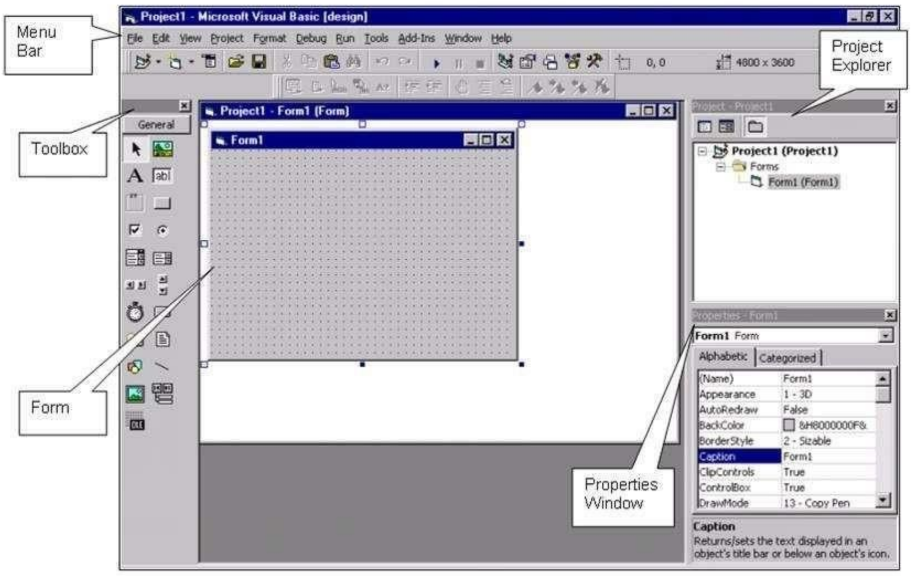


The diagram shows a typical Graphical User interface which has been created using Visual Basic. The programming created in Figure 1.1 requires an environment where we can create and modify the application. This is known as the Integrated Development Environment and is discussed in the next section below.

To launch Visual Basic, on the Taskbar, click Start -> (All) Programs -> Microsoft Visual Studio 6.0 -> Microsoft Visual Basic 6.0. When Microsoft Visual Basic starts, the New Project dialog box comes up:



Double Click on the Standard EXE option (or) Select the default highlighted icon and click an open button. You will be then placed in Visual Basic's design environment as illustrated in Figure 1.3.To open the existing project, select File Menu -> open project.



Form1 Form

Alphabetic | Categorized

(Name)	Form1
Appearance	1 - 3D
AutoRedraw	False
BackColor	&H8000000F&
BorderStyle	2 - Sizable
Caption	Form1
ClipControls	True
ControlBox	True
DrawMode	13 - Copy Pen

Caption
Returns/sets the text displayed in an object's title bar or below an object's icon.

Visual Basic is a high level programming paradigm. Its concepts are based upon Event driven programming. The environment to edit, delete and write code as well as develop windows based applications is known as the 'Integrated Development Environment' (IDE).

From the diagram it can be seen that the IDE is divided into separate areas or 'windows'. We have the Toolbox control which allows us to add objects on to Form window. We can change the properties using the properties windows for all the objects on the form. We can also edit/create the event handlers using the Code Window. When creating applications in Visual Basic it is quite common to use multiple forms, modules etc. The project explorer window is used to keep track of all the additional files used.

The main components of the Integrated Development Environment (IDE) are illustrated in the subsequent text.

Title Bar and Menu Bar

The title bar is the horizontal bar located at the top of the screen. It gives the name of the application and is common to all windows application. Everything below the title bar and menu bars in a window application is called the client area.

In Visual Basic, the title bar starts out displaying: Project1 – Microsoft Visual Basic [design]

The Menu bar gives you accesses too many features within the development environment.

1. On the left is the File Menu. It contains the commands such as you can create, open, print and save projects. All of this menu can also be accessed y right- clicking in the project explorer.

2. Next to File is the Edit menu. From here you can perform many of the editing tools that will help you write the code that activates the interface you design for your application, including the search- and-replace editing tools.

3. The View menu gives you fast access to the different parts of your program and to the different parts of the Visual Basic environment.

4. The Project menu is the heart of your project. You can add to and remove forms, code modules, user controls, property pages, as well as ActiveX designers from your projects.

5. The Format menu gives you a way to specify the look of controls that you will place on your forms.

6. The Debug menu contains the tools used to correct (debug) problems, or bugs in your code.

7. The Run menu gives you the tools needed to start and stop your program while in the development environment.

8. The Query and Diagram menu are mostly used in advanced database development. The commands in the Query menu simply the creation of SQL queries. The Diagram menu is used for building database application.

9. The Tools menu gives you access to ways of adding procedures and menus to your programs

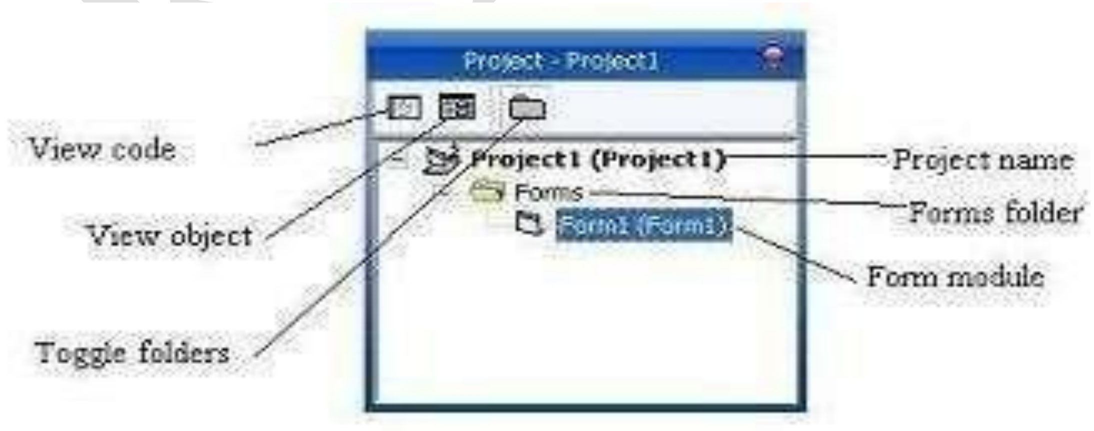
10. The Add-Ins menu contains additional utilities called Add-Ins. By default you should have an option for Visual Data Manager and another for the Add-In Manager. Visual Data Manager is a simple but useful tool that allows you to design and populate a database in many popular formats, including Microsoft Access. The Add-In Manager allows you to select other Add-In utilities to be added to the Add-Ins menu.

11. The Window menu lets you control how the windows that make up the visual Basic environment are arranged.

12. Finally, the Help menu is your second stop when you get in a jam.

Notice that all menus have one letter underlined. Pressing ALT and the underlined letter open that menu.

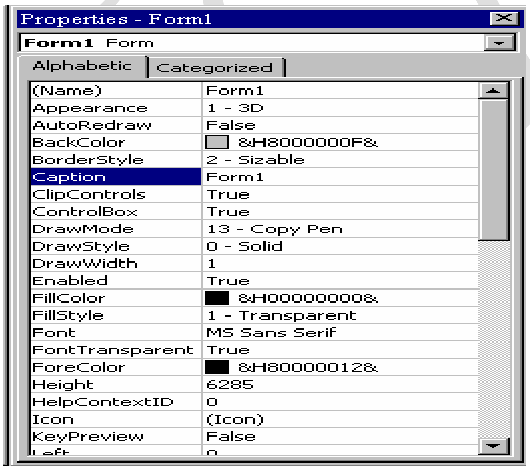
Project Explorer



Docked on the right side of the screen, just under the tool bar is the Project Explorer Window. The Project Explorer Window as show above serves as a quick reference to the various elements of a project namely for, classes and modules. The entire object that makes up the application is packed in a project. It looks like a tree-like structure. A simple project will typically contain one form, which is a window that is designed as part of a program's interface. The three tools in the top of the Project Explorer are described in the following table.

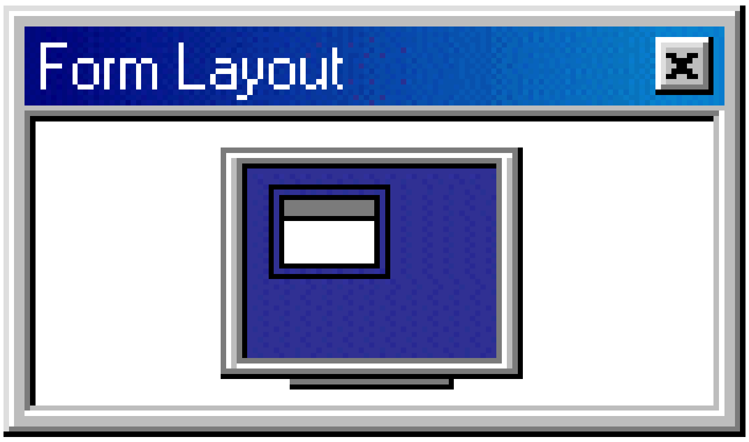
Properties Window

The Properties Window is docked under the Project Explorer window. The Properties Window exposes the various characteristics of selected objects. Each and every form in an application is considered an object. Now, each object in Visual Basic has characteristics such as color and size. Other characteristics affect not just the appearance of the object but the way it behaves too. All these characteristics of an object are called its properties. Thus, a form has properties and any controls placed on it will have properties too. All of these properties are displayed in the Properties Window.



(Name)	Form1
Appearance	1 - 3D
AutoRedraw	False
BackColor	⬜ &H8000000F&
BorderStyle	2 - Sizable
Caption	Form1
ClipControls	True
ControlBox	True
DrawMode	13 - Copy Pen
DrawStyle	0 - Solid
DrawWidth	1
Enabled	True
FillColor	⬛ &H00000000&
FillStyle	1 - Transparent
Font	MS Sans Serif
FontTransparent	True
ForeColor	⬛ &H80000012&
Height	6285
HelpContextID	0
Icon	(Icon)
KeyPreview	False
Left	0

Form Layout Window

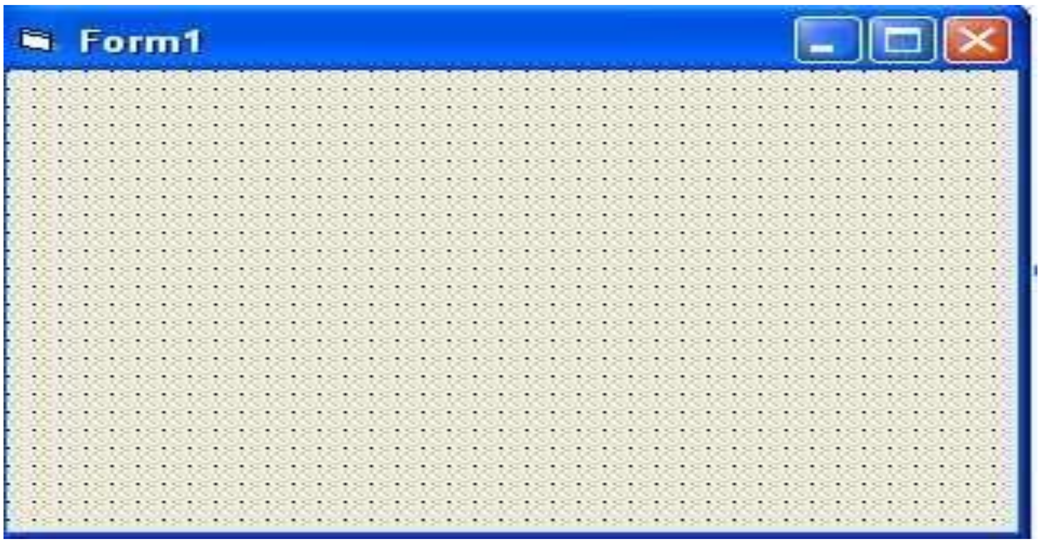


The Form Layout window allows you to position the location of the form at run time relative to the entire screen using a small graphical representation of the screen.

Tool Box

The Toolbox contains a set of controls that are used to place on a Form at design time thereby creating the user interface area. Additional controls can be included in the toolbox by using the Components menu item on the Project menu.

Form Designer



It is used to design the interface application. We add controls, graphics and pictures to a form to create the way we want. Each form in the application has its own form designer windows.

Object Browser

The Object Browser allows us to browse through the various properties, events and methods that are made available to us. It is accessed by selecting Object Browser from the View menu or pressing the key F2. The left column of the Object Browser lists the objects and classes that are available in the projects that are opened and the controls that have been referenced in them. It is possible for us to scroll through the list and select the object or class that we wish to inspect. After an object is picked up from the Classes list, we can see its members (properties, methods and events) in the right column. A property is represented by a small icon that has a hand holding a piece of paper. Methods are denoted by little green blocks, while events are denoted by yellow lightning bolt icon.

Tool Bars

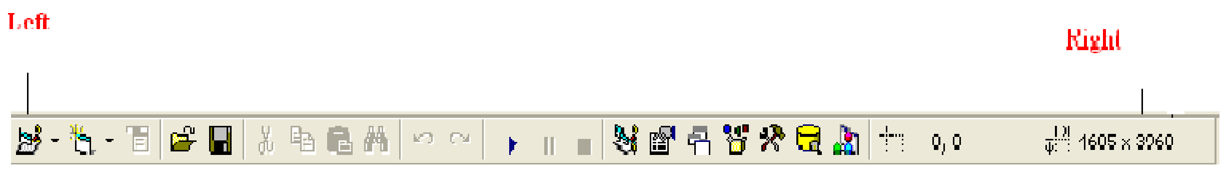
The toolbars gives you quick access to commonly used menu commands. The Visual Basic IDE provides additional toolbars for specific purpose, such as editing, form designing and debugging. To view the additional toolbars, choose View -> Toolbars

Visual Basic supports multiple toolbars which are split into four main areas such as,

Standard toolbar Edit toolbar Debug toolbar Form Editor

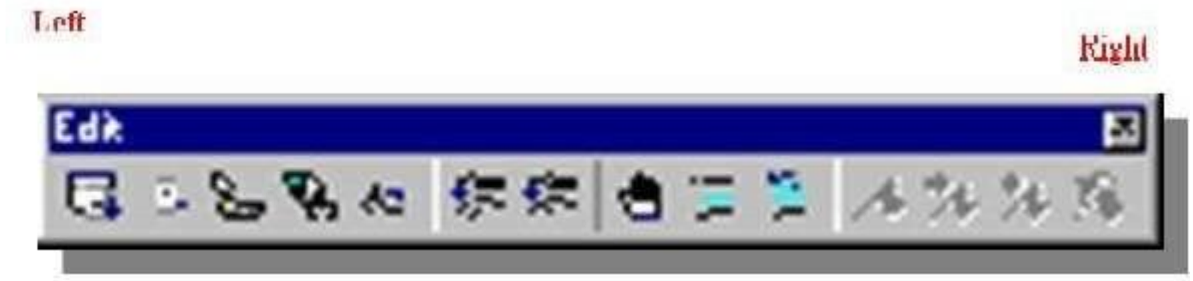
Standard Tool Bar

The Standard tool bar is displayed by default and offers quick access to frequently used functions.



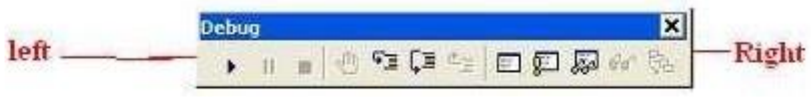
Edit Tool Bar

The Edit tool bar's buttons are handy when you're debugging your program.



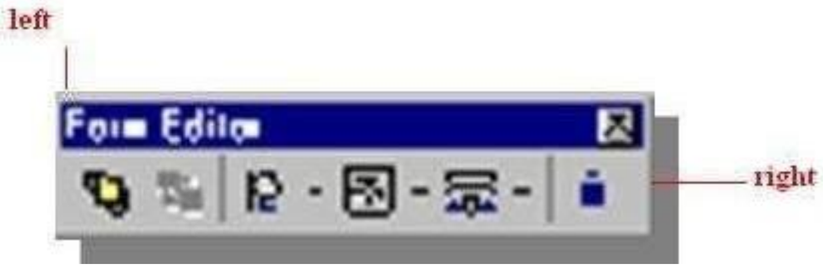
Debug Tool Bar

The debug tool bar has buttons for use when you're debugging your programs



Form Editor Tool Bar

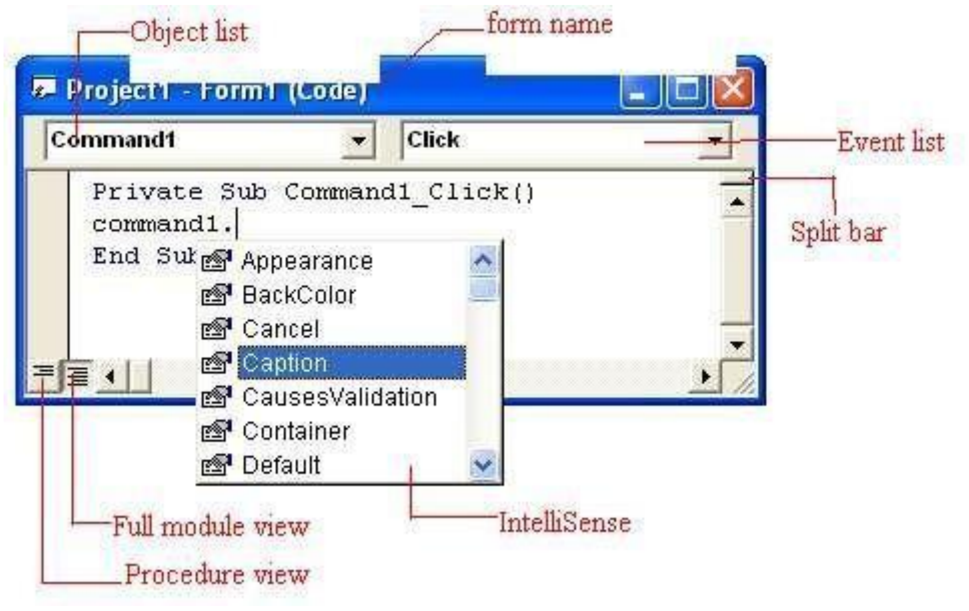
The Form Editor Toolbar contains buttons that help you tweak the appearance of the controls on your forms.



The Code Window

The Code Window is where you write Visual Basic Code for your application. Code consists of languages of statements, constants and declarations. Using the code window you quickly view and edit any of the code in your application. The Code window opens whenever you double-click a control or form or From Project Explorer Window select the name of a form or module or you can choose the View Code icon or View Code.

The Code Window has the following sections see figure



```
Private Sub Command1_Click()
command1.
End Sub
```

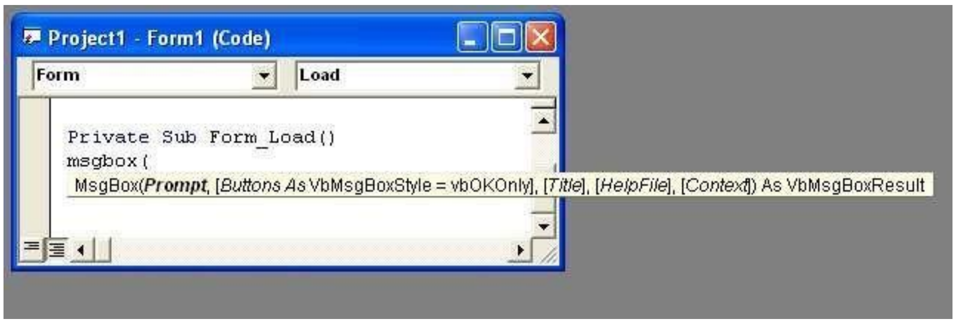
The Split Bar: The Split bar is located below the title bar at the top of the vertical scroll bar. Split bar is used when complicated codes are performed in your application. That is the window is splitted into two different parts of your code at once.

The Object List Box: The left drop-down list box in the code window, called the object box. Lists all the objects on the form.

The Event List Box: The right drop-down list box in the code window, called the Event List box. This Box gives the events recognized by the object you have selected in the object list box.

IntelliSense: IntelliSence saves you a lot of typing work. Its purpose is to display a pop up little boxes with helpful information about the object you are working with. It works with three components.

Quickinfo: You get the information about the syntax. Whenever you enter a keyword followed by a space or opening parenthesis, a tip appears and gives the suntax for that element. For Example, Quickinfo feature work for the Msgbox Statement, which pops up a simple box.



```
Private Sub Form_Load()
msgbox (
MsgBox(Prompt, [Buttons As VbMsgBoxStyle = vbOKOnly], [Title], [HelpFile], [Context]) As VbMsgBoxResult
```

List Properties /Methods: This feature gives you a list of the properties and methods of an object right after you type the period. See figure

Available constant: If you had a label named Label1 on your form and you entered

Label1.Visible= True

You would see a pop up dialog box listing True or False (select any one from the list and press TAB to complete it)

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COIMBATORE- 641021

DEPARTMENT OF COMMERCE COMPUTER APPLICATION

SUBJECT: SOFTWARE DEVELOPMENT WITH VISUAL BASIC **SUBJECT CODE: 17CCU501A**

SEMESTER: V **UNIT: I** **CLASS: III BCom CA**

S. NO	QUESTIONS	OPTION 1	OPTION 2	OPTION 3	OPTION 4	ANSWER
1	visual basic was developed form the programming language	FORTRAN	C	BASIC	C++	BASIC
2	visual bais cis developed in the year	1978	1980	1970	1972	1970
3	A complete installation of the most powerful version of visual basic 6.0, the enterprise edition require ________ of hard disk space	250MB	250GB	460MB	460GB	250MB
4	Visual Basic 6.0 requires of RAM	18MB	16MB	18GB	16GB	16MB
5	IDE stands for ______________	Integrated development	Integrated developed environment	Integration development environment	none	Integrated development environment
6	IDE is also commonly referred to as____________ environment	interface	development	design	integrated	design
7	IDE was designed as a _______________	OLE	SDI	MDI	none	SDI
8	The windows associated with the project will stay with in a single container called as ___________	child	parent	code	none	parent
9	The ________ in the menubar provide quick access to the commonly used commands	toolbars	toolbox	project window	form	toolbars
10	_____________ helps to move and resize the	label	shape	OLE	pointer	pointer

	controls and forms					
11	_________ carries out the specified action when the user choose it	option button	image control	shape control	command button	command button
12	_________ is the control used to display messages and enter text	tool box	text box	command button	option button	text box
13	_______ also acts as a coontainer for child forms and some controls	SDI	MDI	IDE	none	MDI
14	___________ is a window that contains an application code and has other objects place on it to create the use interface	properties	menu	form	border	form
15	__________ is an actioon that can be performed on objects	form	move	click	method	method
16	________ control enables the user to connect to an existing database and display information from it.	object	properties	data	file	data
17	__________ serves as a window that can be customized and controls graphics and pictures can also be added to it.	object	properties	form	file	form
18	Each and every form in an application is considered an ___________	object	properties	file	none	object
19	Characteristics of an object are called its ________	objects	properties	project	none	properties
20	__________ method is used to display the form object	load	visible	show	display	show
21	________ method is used to load a form or control into memory but doesnot display it	load	visible	show	display	load
22	______ displays a text that the user cannot modify or interact with	label	text box	timer	line	label
23	_______ has the zorder event in it.	list box	Ms flex grid	grid	label	list box
24	__________ displays and operates on tabular data	grid	Msflexgrid	DB grid	none	Msflexgrid
25	_________ displays information at run time	status bar	option button	text box	rich text box	text box
26	__________ control is used to display icons, bitmaps, metafiles etc….,	shape control	image control	picture box	check box	image control

27	The code entered in the ___________ event fires when there is a change in the contents of the text box.	change	click	mouse move	none	change
28	The _______ event fires when the textbox control is clicked.	change	click	mouse move	none	click
29	The _________ event fires when the mouse is moved over the textbox	change	click	mouse move	none	mouse move
30	A complete repaint of a form or control can be enforced by _________ method	refresh	set focus	change	repaint	refresh
31	_________ is used to link or embed object, display and manipulate data from other windows based application	.VBP	.FRM	OLE	none	OLE
32	_________ is the named attribute of a programming object	property	window	object	none	property
33	_________ is the named attribute of a programming object	window	object	property	none	property
34	________ lets windows decide whrer the form should be shown	center screen	manual	center owner	windows default	windows default
35	________ indicates whether the window is shown normally, maximized or minimized.	window state	windows default	both	none	windows default
36	________ event occurs when the form is closed by user.	load	unload	show	none	unload
37	Writing a VB program involves _________ steps	2	5	3	4	2
38	___________ steps involves designing an application with various tools that come along with VB package	visual programming	code programming	both	none	visual programming
39	_________ steps involves writing programs using text editor.	visual programming	code programming	both	none	code programming
40	__________ is the name property for the form object	display prog	code programming	form display	none	code programming
41	_________ is the caption property for the command button if name is cmdexit	&exit	& clear	&display	none	&exit

42	_______ is the name property for the command button if caption property is &clear.	cmdexit	cmdclear	cmddisplay	none	cmdclear
43	_______ is the caption property for the command button if name is cmddisplay	&exit	& clear	&display	none	&display
44	________ is the name property for the command button if caption is &display	cmdexit	cmdclear	cmddisplay	none	cmddisplay
45	VB project files are saved with an _________ extension	.VBP	.FRM	.OLE	.EXE	.VBP
46	VB form files are saved with an ______ extension	.VBP	.FRM	.OLE	.EXE	.FRM
47	________ box displays the name of the selected object associated with the form	object	tool	text	command	object
48	Intersection of row and column is _________	cell	record	field	none	cell
49	the cols and rows properties are used to determine the number of columns and rows in a _____________control	flexgrid	ms flexgrid	grid	none	ms flexgrid
50	________ event occurs whenever the size of form is ahanged	size	resize	height	width	resize
51	______ kinds of rows/columns are created in the msflexgrid contorl.	4	3	2	1	2
52	Ms flexgrid control is an __________control	OCX	XCO	COX	XOC	OCX
53	user can change the current cell at run time using ___________	mouse	arrow keys	both	none	both
54	To display the wrapped text, we need to ____________ the cell’s column width	increase	decrease	normal	hide	increase
55	If a cell’s text is too long to be displayed in the cell, and the word wrap property is set to ___________	FALSE	TRUE	0	1	TRUE
56	To add the flexgrid, choose complnents from _______ menu	browser	property	project	none	project
57	After setting the properties, the ms flexgrid control is enlarged vertically and horizontally by __________ its handles.	moving	resizing	hiding	dragging	dragging
58	Ms flexgrid has the _________ properties	row	rows	both	none	both

59	Ms flexgrid has the __________ properties	col	cols	both	none	both
60	____________ property is set to change the height of a cell	row height	height row	height	none	row height

UNIT-II

SYLLABUS

Variables – Constants – Literals – Data Types – Operators – Sub routines and Functions Program Flow Control – String Functions – Numeric Functions – Date Functions.

VARIABLS

Variables used to store information in the computer's memory while running the programs. There are three components to define a variable,

- The Variable's name
- The type of information being stored
- The actual information itself

A Variable must have a name for you to be able to assign values to it. There are rules you should follow while naming your variables. The name of a variable:

- Must begin with a letter
- Cannot have a period (remember that we use the period to set a property; in other words the period is an operator)
- Can have up to 255 characters.
- Must be unique inside of the procedure or the module it is used in (we will learn what a module is)

Once a variable has a name, you can use it as you see fit. For example, you can assign it a value and then use the variable in your program as if it represented that value.

Creating/ Declaring Variables

When a variable is created within a program, it is said to be "declared". When declaring a variable, you must give it a name and a type. Based on the type, the variable will automatically be loaded with some default data. Your first variable will be named "x" and will hold a number. Consider the follow code,

```
Private Sub
Form_Load() Dim x
As Integer
End Sub
```

Analysis

The previous code consists of 3 lines. We will only take interest in the second line for now. This statement is made up of 4 words. "Dim" stands for "Dimension", and instructs your computer that you would like to create a new variable. "x" is the name of the variable. You must separate "Dim" and the name of your variable with a space. "As" is an instruction to your computer that you would now like to define the type of the new variable. "Integer" is the name of a type that is built-in to Visual Basic. "As" must be separated from the variable name and the variable type by a space.

Output
When you launch this program with F5, nothing will appear to happen before the form loads. However, a variable has been created in memory called "x" with a type of "Integer".

Data Types

• Byte
The Byte data type is an 8-bit variable which can store value from **0 to 255**. This data type is very useful for storing binary data.

• Double
. The Double data type is a 64-bit floating point number used when high accuracy is needed. These variables can range from - 1.79769313486232e308 to - 4.94065645841247e-324 for negative values and from 4.94065645841247e-324 to 1.79769313486232e308 for positive values

• Integer
The Integer data type is a 16-bit number which can range from **-32768** to **32767**. Integers should be used when you are working with values that can not contain fractional numbers.

• Long
The Long data type is a 32-bit number which can range from **-2,147,483,648** to **2,147,483,647**. Long variables can only contain non fractional or whole integer values. I myself use Long variables over Integers for increased performance. Most Win32 functions use this data type for this reason.

Variables	**Character**
Integer	%
Long	&
Single	!
Double	#
Currency	@
String	$
Byte	None
Boolean	None
Date	None
Object	None
Variant	None

• Single

The Single data type is a 32-bit number ranging from -3.402823e38 to -1.401298e- 45 for negative values and from 1.401298e-45 to 3.402823e38 for positive values. When you need fractional numbers within this range, this is the data type to use.

• String

The String data type is usually used as a variable-length type of variable. A variable-length string can contain up to approximately 2 billion characters. Each character has a value ranging from 0 to 255 based on the ASCII character set. Strings are used when Text is involved.

Note: Variant variables can store any type of data.

Declaring a Variable

There are two ways to declare a variable in Visual Basic

1. Explicit Declarations – These statements do not assign values to the variables but merely tell Visual Basic what the variables should be called and what type of data they can contain.
2. Implicit Declarations – with this type of declarations, a special character is used at the end of the variable name when the variable is first assigned a value

   Eg: nNumVal%=0
   Sfirstname$=" Gary
   Cornel" VInpval = 5

Notice that the variable VInpval dosen't have a declarations character. Such a type is named by Variant type.

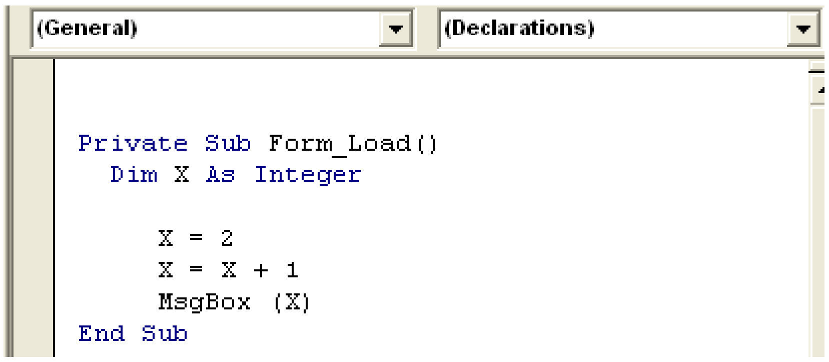
- Fixed –Length Strings – A fixed-length string remains the same size, regardless of the information assigned to it.

Syntax: Dim varname As string * strlength

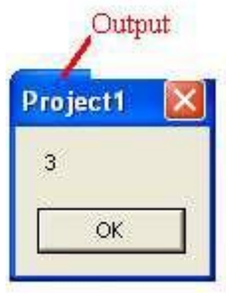
Assigning a value less than 15 characters in length to sName would make the remaining character spaces

Eg:1 Assigning and Displaying the result

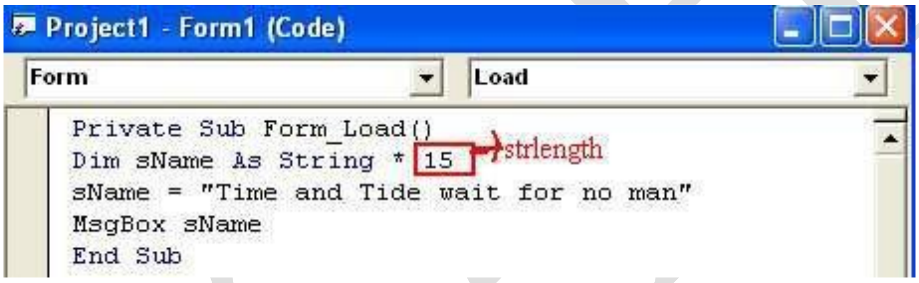
To give a variable some new data, you can use the assignment operator ("="). For example, declaring x as an Integer variable and loading it with the value 2 would be accomplished in this way:



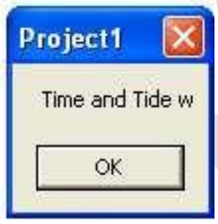
```
Private Sub Form_Load()
  Dim X As Integer

     X = 2
     X = X + 1
     MsgBox (X)
End Sub
```



Eg:2 Assigning and Displaying the result



```
Private Sub Form_Load()
Dim sName As String * 15
sName = "Time and Tide wait for no man"
MsgBox sName
End Sub
```



Constants

A constant is a meaningful name that takes the place of a number or string that does not change. Constants store values that, as the name implies, remain the same throughout the execution of an application. You can greatly improve the readability of your code and make it easier to maintain by using constants. Use them in code that contains values that reappear or that depends on certain numbers that are difficult to remember or have no obvious meaning.

Declaring a Constant

The Const keyword is used to declare a constant and set its value. By declaring a constant, you assign a meaningful name to a value. Once a constant is declared, it cannot be modified

or assigned a new value. The constant must have a valid symbolic name (the rules are the same as those for creating variable names) and an expression composed of numeric or string constants and operators (but no function calls). For example consider the following
Public Const DaysInYear = 365
Private Const WorkDays = 250

Operators

An operator is a code element that performs an operation on one or more code elements that hold values. Value elements include variables, constants, literals, properties, returns from Function and Operator procedures, and expressions.
An ***expression*** is a series of value elements combined with operators, which yields a new value. The operators act on the value elements by performing calculations, comparisons, or other operations.

Types of Operators
Visual Basic provides the following types of operators:

- **Arithmetic Operators** perform familiar calculations on numeric values, including shifting their bit patterns.
- **Comparison Operators** compare two expressions and return a Boolean value representing the result of the comparison.
- **Concatenation Operators** join multiple strings into a single string.
- **Logical and Bitwise Operators** in Visual Basic combine Boolean or numeric values and return a result of the same data type as the values.

The value elements that are combined with an operator are called *operands* of that operator. Operators combined with value elements form expressions, except for the assignment operator, which forms a *statement*.

Arithmetic Operator

Operator	Meaning	Example
+	Addition	A=3+5 => A=8
-	Subtraction	B=6-4 => B=2

*	Multiplication	C=5*7 => C=35
/	Division	D=5/2 => D=2.5
^	Exponent	E=2^2 => E=4
%	Modulus	F=5%4 => F=1
	Integer Division	G=5 2 => G=2

Comparison Operator

Operator	Meaning	Example
>	Lessthan	8 > 7 => False
<	Greaterthan	8 < 7 => True
<=	Lessthan or Equals to	8 <= 7 => False
>=	Greaterthan or Equals to	8 >= 8 => True
= =	Equality	9 = = 8 => False
< >	Inequality	9 < > 8 => True

Concatenation Operator

Concatenation operators join multiple strings into a single string. There are two concatenation operators, ‘+’ and ‘&’. Both carry out the basic concatenation operation, as the following example shows.

```
Dim x As String = "Mic" & "ro" & "soft"
Dim y As String = "Mic" + "ro" + "soft"
' The preceding statements set both x and y to "Microsoft".
```

Sub Routine and Functions

Subroutines is a sub or miniature programs. A subroutine has a name attributed with it, much like a variable does. Unlike a variable, a subroutine doesn't hold data. Instead, it holds code. When the code in a subroutine is executed, the subroutine is said to be "called". Therefore, one subroutine can "call" another subroutine. Some subroutines are called automatically when certain actions are performed. For example, the Form_Load subroutine is automatically called when a form loads. This is where you have been inserting your test code before.

Creating a subroutine involves two lines of code. A subroutine begins with the word "Sub", followed by a space, then a name identifying the subroutine. Two parentheses follow, which are used for a parameter list.

Syntax:

```
Sub Test()

End Sub
```

Example

```
Sub TestSub()
        MsgBox "code in TestSub()"
End Sub
Private Sub Form_Load()
        MsgBox "Code in Form_Load()"
        TestSub
        MsgBox "Back in Form_Load()"
End Sub
```

Passing Parameter to the sub routines

Parameters, also called Arguments, are variables that can be "passed into" a subroutine. A subroutine with parameters example

```
Private Sub DisplayAdd(x As Integer, y As Integer)
        MsgBox x + y
End Sub
Private Sub Form_Load()
```

```
        DisplayAdd 5, 2
End Sub
```

A new subroutine has been declared called DisplayAdd. This declaration is different than the declarations that you have seen so far, however, as code has been added between the parenthesis. From your knowledge of variables, this syntax should look somewhat similar to you. `x As Integer` and `y As Integer appear` to be variable declarations without the "Dim" keyword. These declarations are separated by a comma. These variables are the Parameters for the DisplayAdd subroutine. Code within the subroutine can access x and y as usual, as if they were normal variables. However, when the subroutine is called, the calling subroutine will also provide values for these parameters. Therefore, the subroutine has now become dynamic. The code can act on input without caring where the input came from. When the Form_Load subroutine calls DisplayAdd with the parameters 5 and 2, the code within DisplayAdd is executed. The first line adds x and y together and displays the result. x and y have already been filled with the values 5 and 2 from the Form_Load subroutine.

Call by Value and Call by Reference

Parameters can be sent to a subroutine By Reference (ByRef) or By Value (ByVal). ByRef is the default, and means that changes to the variable in the subroutine will result in changes to the source variable outside of the subroutine. ByVal literally copies the values of the variables from the calling subroutine into the called subroutine. By doing this, the variables can be changed, but their values will not change outside of the called subroutine. ByVal can also be a lot slower with large variable types, however, since memory has to be copied from one location to another. If you don't have any reason to do so, there is no need to pass variables ByVal. You can explicitly state the way that a variable is passed to a subroutine by using these keywords before the variable name. Using the ByRef keyword, one could write a Swap function, which switches the values of 2 variables.

```
Private Sub Swap(ByRef x As Integer, ByRef y As Integer)
   Dim temp As Integer
   temp = x
   x = y
   y = temp
End Sub
```

```
Private Sub DisplayVals(ByRef a As Integer, ByVal b As Integer)
   'Don't worry about understanding the next line yet, it will be explained later
   MsgBox "a = " & CStr(a) & vbCrLf & "b = " & CStr(b)
End Sub

Private Sub Form_Load()
   Dim a As Integer
   Dim b As Integer
   a = 10
   b = 12
   'Display values, swap, and display again
   DisplayVals a, b
   'The next line is functionally identical to "Swap a, b"
   Call Swap(a, b)
   DisplayVals a, b
End Sub
```

Notice that Call was used instead of simply stating the subroutine name. When using the Call method however, you must use parenthesis when calling the subroutine. Note that this program would also have worked without typing "ByRef" anywhere, since it is the default. The ByRef and ByVal keywords are rarely used in simple programs, however, but it's a nice trick for your toolkit.

Functions

Subroutines have a close cousin called Functions. Functions are basically the exact same as subroutines, except that they return a value. That means that the function itself has a type, and the function will return a value to the calling subroutine based on the code that it contains. An example of this would be a function that adds two numbers, shown below. A function is declared the exact same way as a subroutine, except using the "Function" keyword instead of "Sub". To return a value, assign a value of the proper type to the function's name, as if it were a variable.

```
Private Function Add(ByVal x As Integer, ByVal y As Integer) As Integer
   Dim Res as integer
   Res = x + y
   Add = Res
End Function

Private Sub Form_Load()
   Dim a As Integer
   Dim b As Integer
   Dim c As Integer
   a = 32
   b = 64
   c = Add(a, b)
   MsgBox ("Sum is : " & c)
End Sub
```

Control Statements

Control Statements are used to control the flow of program's execution. Visual Basic supports control structures such as if... Then, if...Then ...Else, Select...Case, and Loop structures such as Do While...Loop, While...Wend, For...Next etc method.

1. If...Then selection structure

The If...Then selection structure performs an indicated action only when the condition is True; otherwise the action is skipped.

Syntax

```
If <condition> Then
statement
End If
```

Example

```
 If average>75 Then
txtGrade.Text = "A"
End If
```

The above example checks the condition and if it’s true then assigns the grade A to the text box txtGrade.

2. If...Then...Else selection structure

The If...Then...Else selection structure allows the programmer to specify that a different action is to be performed when the condition is True than when the condition is False.

Syntax

```
If <condition > Then
statement 1
Else
statement 2
End If
```

If the condition is true then statement 1 will be executed if its false statement 2 will be executed.

Example

```
 If average>50 Then
txtGrade.Text = "Pass"
Else
txtGrade.Text = "Fail"
End If
```

In the above example if the average is above 50 text box txtGrade will be assigned Pass or if the condition is false then text box txtGrade will be assigned Fail.

3. Nested If...Then...Else selection structure

Nested If...Then...Else selection structures test for multiple cases by placing If... Then.. .Else selection structures inside If...Then...Else structures.

Syntax of the Nested If...Then...Else selection structure

```
If < condition 1 > Then
statements
Else If < condition 2 > Then
statements
Else If < condition 3 > Then
statements
```

```
Else
Statements
End If
```

Example

Assume you have to find the grade using nested if and display in a text box

```
If average > 75 Then
txtGrade.Text = "A"
Else If average > 65 Then
txtGrade.Text = "B"
Else If average > 55 Then
txtGrade.text = "C"
Else If average > 45 Then
txtGrade.Text = "S"
Else
txtGrade.Text = "F"
End If
```

In the above example the average is check and according the grades A, B, C, S, F are assigned to the text box named txtGrade.

4. Select...Case selection structure

Select...Case structure is an alternative to If...Then...ElseIf for selectively executing a single block of statements from among multiple block of statements. Select...case is more convenient to use than the If...Else...End If. The following program block illustrate the working of Select...Case.

Syntax

```
Select Case Index
Case 0
Statements
Case 1
Statements
End Select
```

According to the index value any one of the case statement will be selected and executed.

Example

Assume you have to find the grade using select…case and display in the text box

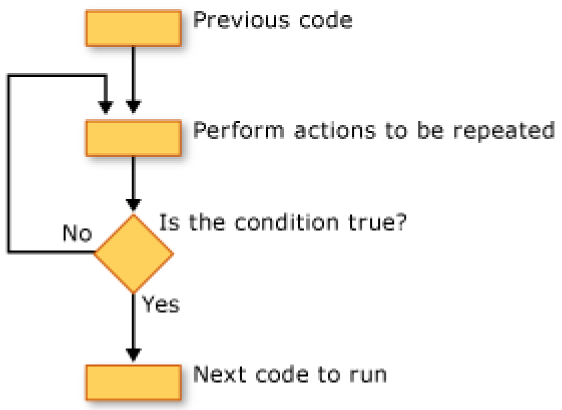
```
Dim average as Integer
average = txtAverage.Text
Select Case average
Case 100 To 75
txtGrade.Text =”A”
Case 74 To 65
txtGrade.Text =”B”
Case 64 To 55
txtGrade.Text =”C”
Case 54 To 45
txtGrade.Text =”S”
Case 44 To 0
txtGrade.Text =”F”
Case Else
MsgBox “Invalid average marks”
End Select
```

Here average is the case index according to the average value any one of the case statement is selected and executed.

Looping Statements

Visual Basic loop structures allow you to run one or more lines of code repetitively. You can repeat the statements in a loop structure until a condition is True, until a condition is False, a specified number of times, or once for each element in a collection.

The following illustration shows a loop structure that runs a set of statements until a condition becomes true.



Running a set of statements until a condition becomes true

1. While loop

The While ... End While construction runs a set of statements as long as the condition specified in the While statement is True. Runs a series of statements as long as a given condition is true.

Syntax

```
While condition
    [ statements ]
    [ Continue While ]
    [ statements ]
    [ Exit While ]
    [ statements ]
End While
```

Term	**Definition**
condition	Required. Boolean expression. If condition is Nothing, Visual Basic treats it as False.
statements	Optional. One or more statements following While, which run every time condition is True.
Continue	Optional. Transfers control to the next iteration of the While block.

Term	**Definition**
While	Required .
Exit While	Optional. Transfers control out of the While block.
End While	Required. Terminates the definition of the While block.

Example:

```
Dim value, i As Integer
i=1
value = 0
While i<=10
value = value + i
i = i + 1
End While
```

The above example counts the numbers from 1 to 10 and stores in variable named value.

2. Do While Loop

The **Do...Loop** While statement first executes the statements and then test the condition after each execution.

Syntax

```
Do
   [ statements ]
   [ Continue Do ]
   [ statements ]
   [ Exit Do ]
   [ statements ]
 Loop While condition
```

Term	**Definition**
Do	Required. Starts the definition of the Do loop.
While	Required unless Until is used. Repeat the loop until condition is False.
condition	Optional. Boolean expression. If condition is Nothing, Visual Basic treats it as False.
statements	Optional. One or more statements that are repeated while, or until, condition is True.
Continue Do	Optional. Transfers control to the next iteration of the Do loop.
Exit Do	Optional. Transfers control out of the Do loop.
Loop	Required. Terminates the definition of the Do loop.

Example

```
Dim number As Long
number = 0
Do
number = number + 1
Loop While number < 201
```

The programs executes the statements between Do and Loop While structure in any case. Then it determines whether the counter is less than 501. If so, the program again executes the statements between Do and Loop While else exits the Loop.

3. Do Until Loop

Unlike the **Do While...Loop**, the **Do Until... Loop** structure tests a condition for falsity. Statements in the body of a **Do Until...Loop** are executed repeatedly as long as the loop-continuation test evaluates to False.

Syntax

```
Do Until condition
   [ statements ]
   [ Continue Do ]
   [ statements ]
   [ Exit Do ]
   [ statements ]
Loop
```

Term	**Definition**
Do	Required. Starts the definition of the Do loop.
Until	Required unless Until is used. Repeat the loop until condition is False.
condition	Optional. Boolean expression. If condition is Nothing, Visual Basic treats it as False.
statements	Optional. One or more statements that are repeated while, or until, condition is True.
Continue Do	Optional. Transfers control to the next iteration of the Do loop.
Exit Do	Optional. Transfers control out of the Do loop.
Loop	Required. Terminates the definition of the Do loop.

Example

```
Dim number As Long
number=0
Do Until number > 1000
number = number + 1
Print number
Loop
```

Numbers between 1 to 1000 will be displayed on the form as soon as you click on the command button.

4. For Loop

The For….Next construction performs the loop a set number of times. It uses a loop control variable, also called a counter, to keep track of the repetitions. You specify the starting and ending values for this counter, and you can optionally specify the amount by which it increases from one repetition to the next.

```
For counter [ As datatype ] = start To end [ Step step ]
    [ statements ]
    [ Continue For ]
    [ statements ]
    [ Exit For ]
    [ statements ]
Next
```

Part	**Description**
counter	Required in the For statement. Numeric variable. The control variable for the loop. For more information, see Counter Argument later in this topic.
datatype	Optional. Data type of counter. For more information, see Counter Argument later in this topic.
start	Required. Numeric expression. The initial value of counter.
end	Required. Numeric expression. The final value of counter.
step	Optional. Numeric expression. The amount by which counter is incremented each time through the loop.

Part	Description
statements	Optional. One or more statements between For and Next that run the specified number of times.
Continue For	Optional. Transfers control to the next loop iteration.
Exit For	Optional. Transfers control out of the For loop.
Next	Required. Terminates the definition of the For loop.

Example

Dim x As
Integer For x = 1
To 50 Print x
Next
The above for loop prints the numbers from 1 to 10 till the condition returns false.

Other Statement in VB

Exit Statement

Exit Statement just exits a procedure or block and transfers control immediately to the statement following the procedure call or the block definition.
Syntax

Exit { Do | For | Function | Select | Sub | While }

Statements

Exit Do
Immediately exits the Do loop in which it appears. Execution continues with the statement following the Loop statement. Exit Do can be used only inside a Do loop. When used within nested Do loops, Exit Do exits the innermost loop and transfers control to the next higher level of nesting.

Exit For
Immediately exits the For loop in which it appears. Execution continues with the statement following the Next statement. Exit For can be used only inside a For...Next loop.

Exit Function
Immediately exits the Function procedure in which it appears. Execution continues with the statement following the statement that called the Function procedure. Exit Function can be used only inside a Function procedure.

Exit Select
Immediately exits the Select Case block in which it appears. Execution continues with the statement following the End Select statement. Exit Select can be used only inside a Select Case statement.

Exit Sub
Immediately exits the Sub procedure in which it appears. Execution continues with the statement following the statement that called the Sub procedure. Exit Sub can be used only inside a Subprocedure.

In a Sub procedure, the Exit Sub statement is equivalent to the Return statement.

Exit While
Immediately exits the While loop in which it appears. Execution continues with the statement following the End While statement. Exit While can be used only inside a While loop. When used within nested While loops, Exit While transfers control to the loop that is one nested level above the loop where Exit While occurs.

Example

```
Dim index As Integer = 0
Do While index <= 100
   If index > 10 Then
      Exit Do
   End If

   Debug.Write(index.ToString & " ")
   index += 1
Loop

Debug.WriteLine("")
' Output: 0 1 2 3 4 5 6 7 8 9 10
```

The above example, the loop condition stops the loop when the index variable is greater than 100. The If statement in the loop, however, causes the Exit Do statement to stop the loop when the index variable is greater than 10.

Goto Statement

GoTo statement branches unconditionally the flow of the control to a specified line in a procedure.

Syntax

GoTo line

Here, line requires any line label.

The GoTo statement can branch only to lines in the procedure in which it appears. The line must have a line label that GoTo can refer to.

Example

```
Sub gotoStatementDemo()
        Dim number As Integer = 1
        Dim sampleString As String
        ' Evaluate number and branch to appropriate label.
        If number = 1 Then GoTo Line1 Else GoTo Line2
Line1:
        sampleString = "Number equals 1"
        GoTo LastLine
Line2:
       sampleString = "Number equals 2"
LastLine:
       Debug.WriteLine(sampleString)
End Sub
```

The above program shows the unconditional branching of the program flow using the goto statement.

End Statement

End statement terminates the procedure unconditionally.

Syntax

End

Example

```
Sub sample()
          MsgBox("Sample Program")
          End
End Sub
```

The above program terminates once the message box is displayed to the user.

String Functions:

VB has numerous built-in string functions for processing strings. Most VB string-handling functions return a string, although some return a number (such as the Len function, which returns the length of a string and functions like Instr and InstrRev, which return a character position within the string). The functions that return strings can be coded with or without the dollar sign ($) at the end, although it is more efficient to use the version with the dollar sign. Visual Basic string functions return a string, and usually accept one or more strings as arguments. The table below lists some of the common string functions.

Function	**Description**
InStr	Returns the position of the first occurrence of one string within another. The search begins at the first character of the string
InStrRev	Returns the position of the first occurrence of one string within another. The search begins at the last character of the string
LCase	Converts a specified string to lowercase
Left	Returns a specified number of characters from the left side of a string
Len	Returns the number of characters in a string
LTrim	Removes spaces on the left side of a string
RTrim	Removes spaces on the right side of a string
Trim	Removes spaces on both the left and the right side of a string
Mid	Returns a specified number of characters from a string
Replace	Replaces a specified part of a string with another string a specified number of times
Right	Returns a specified number of characters from the right side of a string
Space	Returns a string that consists of a specified number of spaces
StrComp	Compares two strings and returns a value that represents the result of the comparison
String	Returns a string that contains a repeating character of a specified length
StrReverse	Reverses a string
UCase	Converts a specified string to uppercase

Date and Time Function

Visual Basic includes the date and time functions described in the table below. Note that the functionsDate(),Now(), andTime()do not accept arguments, so parentheses are not actually required.

Function	Description
CDate	Converts a valid date and time expression to the variant of subtype Date
Date	Returns the current system date
DateAdd	Returns a date to which a specified time interval has been added
DateDiff	Returns the number of intervals between two dates
DatePart	Returns the specified part of a given date
DateSerial	Returns the date for a specified year, month, and day
DateValue	Returns a date
Day	Returns a number that represents the day of the month (between 1 and 31, inclusive)
FormatDateTime	Returns an expression formatted as a date or time
Hour	Returns a number that represents the hour of the day (between 0 and 23, inclusive)
IsDate	Returns a Boolean value that indicates if the evaluated expression can be converted to a date
Minute	Returns a number that represents the minute of the hour (between 0 and 59, inclusive)
Month	Returns a number that represents the month of the year (between 1 and 12, inclusive)
MonthName	Returns the name of a specified month
Now	Returns the current system date and time
Second	Returns a number that represents the second of the minute (between 0 and 59, inclusive)
Time	Returns the current system time
Timer	Returns the number of seconds since 12:00 AM
TimeSerial	Returns the time for a specific hour, minute, and second
TimeValue	Returns a time
Weekday	Returns a number that represents the day of the week (between 1 and 7, inclusive)
WeekdayName	Returns the weekday name of a specified day of the week
Year	Returns a number that represents the year

Numeric Function

The table below lists some of the common mathematical functions which are used for numeric value evaluations.

Function	**Description**
Abs	Returns the absolute value of a specified number
Atn	Returns the arctangent of a specified number
Cos	Returns the cosine of a specified number (angle)
Exp	Returns *e* raised to a power
Hex	Returns the hexadecimal value of a specified number
Int	Returns the integer part of a specified number
Fix	Returns the integer part of a specified number
Log	Returns the natural logarithm of a specified number
Oct	Returns the octal value of a specified number
Rnd	Returns a random number less than 1 but greater or equal to 0
Sgn	Returns an integer that indicates the sign of a specified number
Sin	Returns the sine of a specified number (angle)
Sqr	Returns the square root of a specified number
Tan	Returns the tangent of a specified number (angle)

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DEPARTMENT OF COMMERCE COMPUTER APPLICATION

SUBJECT: SOFTWARE DEVELOPMENT WITH VISUAL BASIC **SUBJECT CODE: 17CCU501A**

SEMESTER: V **UNIT: II** **CLASS: III BCom CA**

S. NO	**QUESTIONS**	**OPTION 1**	**OPTION 2**	**OPTION 3**	**OPTION 4**	**ANSWER**
1	VB uses ______ blocks such as variables, data types etc…,	constructing	building	fundamental	specified	building
2	Code in VB is stored in the form of __________	modules	subroutines	variables	standards	modules
3	There are __________ kinds of modules	5	2	3	4	3
4	A simple application may contain a single form and the code resides in the _________ itself	form	module	form module	none	form module
5	__________ is the foundation of object oriented programming in VB	standard	class	form	none	class
6	__________ is the extension for class module	.frm	.CLS	.std	none	.CLS
7	______________ may include constant,type,variable and DLL procedure declarations.	declaration	procedure	variable	statement	declaration
8	By default VB variables are of the ___________ data type.	const	static	variant	none	variant
9	__________ is the value range of byte	0 to 255	1 to 255	0 to 266	1 to 266	0 to 255
10	______ is the value range of integer	-32767 to 32768	-32768 to 32767	32767 to -32768	32768 to -32767	-32768 to 32767
11	_________ are used for storing values temporarily.	character	constant	variable	module	variable
12	From the following which character is allowed while	%	@	_	$	_

	declaring variables					
13	There are __________ ways for declaring variables	1	3	2	4	3
14	____________ statement checks in the module for usege for any undeclared variables.	option explicit	option implicit	int count	none	option explicit
15	__________ variable is one that is declared inside a procedure	global	local	static	scope	local
16	Variables that are declared with keyword _____________ exist only as long as the procedure is being executed	public	private	dim	double	dim
17	To make all variables in a procedure static, ____________ keyword is placed at the beginning of the procedure.	public	private	dim	static	static
18	The module-level variable is available to all the procedures in the module. They are declared using ____________ keywords	public	private	a and b	a or b	a or b
19	VB programs can be broken into smaller logical components called as _________________	procedures	programs	sub	event	procedures
20	Event procedures acquire the declaration _____________by default	public	private	static	global	private
21	_______ window is opened for the module to which the procedures is to be added.	code	add	type	sub	code
22	Functioons are especially useful for taking one or more pieces of data called as __________	modules	arguments	procedures	programs	arguments
23	__________ statements are used to control the flow of program execution	control	property	while	do-while	control
24	________ block is used to define several blocks of statements, in order to execute one block	if then ….. Else	if	then	if … then	if then ….. Else
25	_______ block is used for conditional execuion of one or ore statements	if then … else	if	then	if … then	if … then
26	________ is an alternative to If…Then….Else.	select…case	case…select	select	none	select…case
27	Select…case structure evaluates an expression __________ at the top of the structure	twice	once	thrice	none	once

28	The _______ statement first executex the statemetn and then test the condition after each execution	do….while	while….do	select….case	while	do….while
29	________ structure executes the statements until the condition is satisfied	do…loop	do..loop until	do while…loop	none	do..loop until
30	do…loop until is _________ loop	finite	infinite	long	small	infinite
31	_______ function retrives only date	for…next	next…for	exit for	exit do	for…next
32	A_______ loop can be terminated by an exit for statement	for…next	next…for	exit for	for exit	for…next
33	do….while loop is terminated using _________ statement	exit for	for exit	exit do	do exit	exit do
34	A sequence of variables by the same name can be referred using ________	arrays	modules	sub-routines	none	arrays
35	The individual element of an array are identified using ________	modules	index	base	none	index
36	Fixed size of an array is always _________	remains same	changes	. increased	decreased	remains same
37	Size of dynamic array is changed at _______ time	execution	run	break	stop	run
38	Variables of different datatypes when combined as a single variable to hold several related information is called a ________ datatype	user defined	user like	user string	none	user defined
39	________ statement is used to create a constant.	constant	const	consta	constan	const
40	The ________ function retrieves the date and time	Now	Date	Time	none	Now
41	________ function retrives only time	Now	Date	Time	none	Time
42	________ function retrives only date	Now	Date	Time	none	Date
43	________ function returns the intervals between 2 dates in terms of years, months or dates.	format	diffdate	datediff	relational	datediff
44	________ function accepts a numeric value and converts it to a string in format	specified	relational	logical	comparison	specified
45	________ returns the variant (string) containing a specified number of characters from a string	left()	right()	mid()	instr()	mid()
46	The ______ function returns the length of the string	strcmp()	strrev()	len()	format()	len()

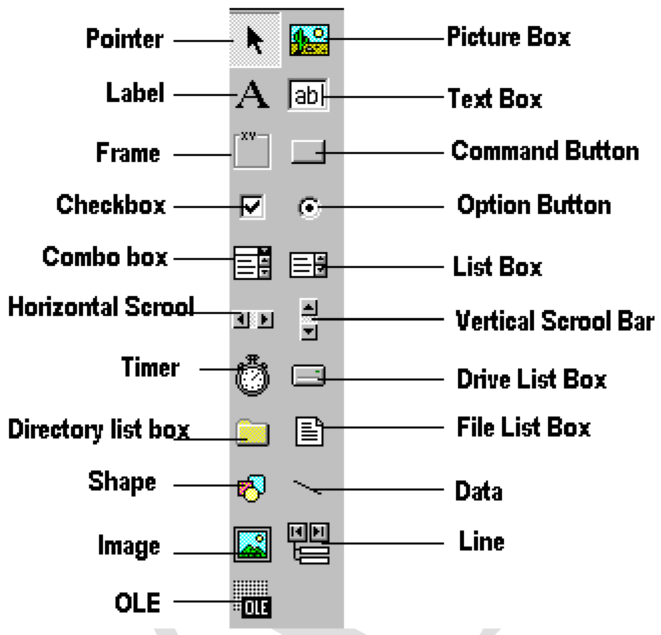
47	__________ is a group of controls that share the same name and type	control arrays	arrays	format arrays	none	control arrays
48	There are _________ ways to create a control array at design time	3	2	1	5	3
49	_________ is the value of the index in the array	TRUE	FALSE	0	index%	index%
50	Control arrays are added at run time using _________ statement.	load	unload	format	unformat	load
51	___________ statement removes a control from an array	load	unload	format	unformat	unload
52	___________ is a named sequence of statements executed as a unit	property	procedure	project	browser	procedure
53	A procedure name is always defined at _______ level	routine	subroutine	procedure	project	procedure
54	_________ is the list box at the upper-right corner of the code window and the debug window that displaya the procedures recognized for the object displayed in the object box.	project file	property page	procedure box	none	procedure box
55	VB offers different types of ________ to execute small sections of coding in applications	project	property	procedure	none	procedure
56	Procedures used in one program can act as a_________ for other programs with slight modifications	building blocks	buildings	construction	module	building blocks
57	A__________ procedure is a procedure block that contains the control's actual name, an under score (_) and avent name.	sub	event	general	function	event
58	A function can also be written by selecting __________ procedure dialog box from the tools menu and by choosing the required scope and type	add	sub	mul	div	add
59	Boolean has __________ function	cbool	cbol	cboolean	cboolea	cbool
60	Decimal has __________ function	cdecimal	cdeci	cdemal	cdec	cdec

UNIT-III

SYLLABUS

Pointers – Label – Frame – Check Box – Compo Box – Scroll Bar – Timer – Shape and Line Control – Command Button – List Box – Image Box – Picture Box – SDI and MDI Form – Data Grid – Flex Grid – Menus – Dialog Box

Toolbox

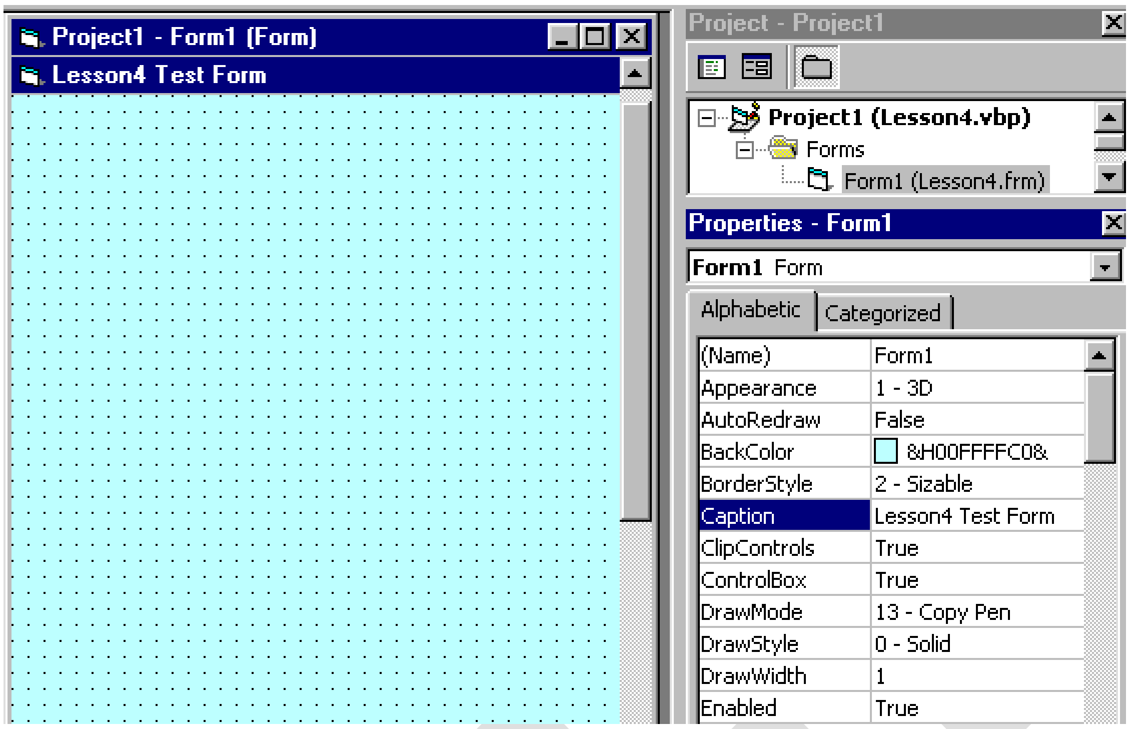


The Toolbox contains a set of controls that are used to place on a Form at design time thereby creating the user interface area. Additional controls can be included in the toolbox by using the Components menu item on the Project menu.

The Form

The Form is the first object you see when you Open the application. It's the window into which all the controls will appear, where you will input data and see results.

There's not too much you can do with the form at this time. Basically, you adjust the **BackColor** and the **StartUpPosition**(where it will open on the screen when you Run it) and then you start putting controls on it.



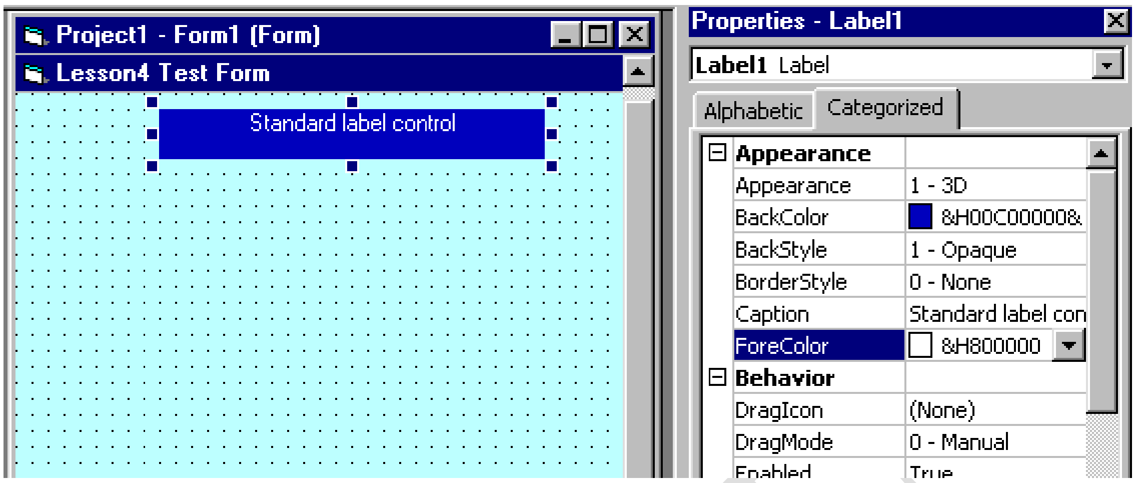
(Name)	Form1
Appearance	1 - 3D
AutoRedraw	False
BackColor	&H00FFFFC0&
BorderStyle	2 - Sizable
Caption	Lesson4 Test Form
ClipControls	True
ControlBox	True
DrawMode	13 - Copy Pen
DrawStyle	0 - Solid
DrawWidth	1
Enabled	True

Form Design and its properties

The Label

This is probably the first control you will master. It is used to display static text, titles and screen output from operations. The important properties to remember:

- Caption – the text that is displayed in the label
- BackColor and ForeColor – colors of the background and the text
- BackStyle – Opaque or Transparent – whether the background is visible or not
- Font – font and size of text
- Alignment – text centered, left or right
- Multiline- True or False – if True, you can have several lines of text, delimited by <CR> in the label – by default, it is set to False



Appearance	
Appearance	1 - 3D
BackColor	🟦 &H00C00000&
BackStyle	1 - Opaque
BorderStyle	0 - None
Caption	Standard label con
ForeColor	⬜ &H800000
Behavior	
DragIcon	(None)
DragMode	0 - Manual
Enabled	True

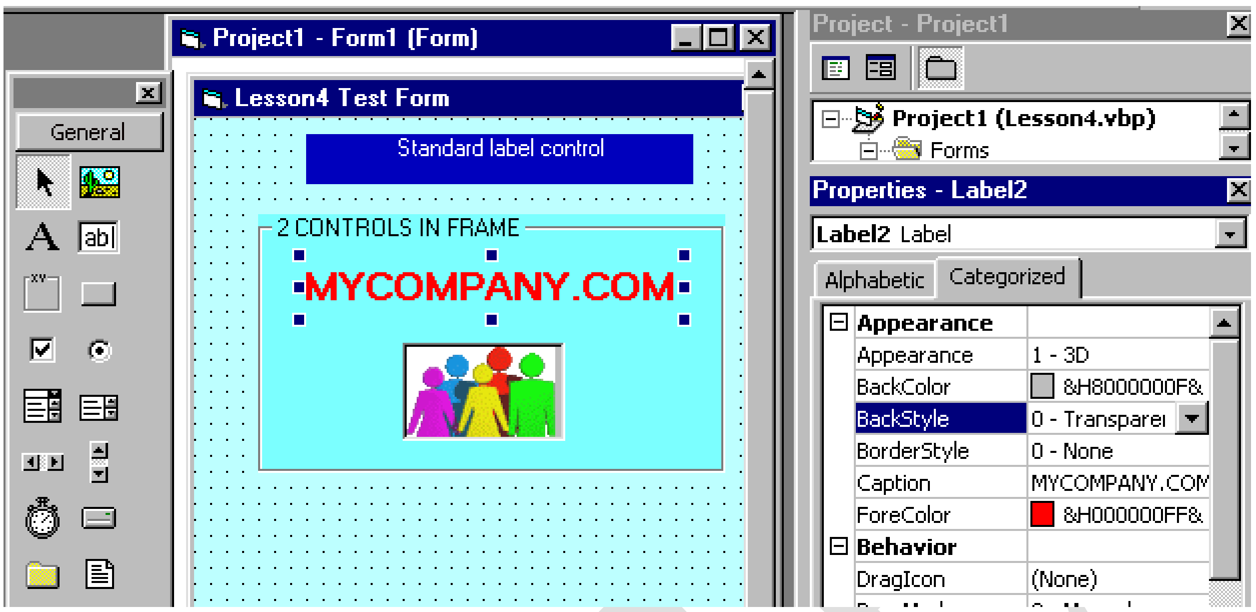
Label and its properties

Frame & PictureBox

When you want to group several controls together - name and address, for example - you use a **Frame**. The frame backcolor can be the same as the form's and only the frame borders will be obvious, or it can be a different color and stand out.

You create the frame before the controls. When you create controls in a frame, they are tied to the frame and move with it. The frame caption is the text that appears at the top of the frame - you use it to define the group.

The **PictureBox** is like a Label with a picture in it instead of text. The **Picture property** determines the name of the file, .BMP or .GIF, that will be displayed. It can be used for a company logo, etc.



Appearance	
Appearance	1 - 3D
BackColor	&H8000000F&
BackStyle	0 - Transparei
BorderStyle	0 - None
Caption	MYCOMPANY.COM
ForeColor	🟥 &H000000FF&
Behavior	
DragIcon	(None)

Picture Box and Frame with its properties

List Box ListBox and ComboBox controls present a set of choices that are displayed vertically in a column. If the number of items exceed the value that be displayed, scroll bars will automatically appear on the control. These scroll bars can be scrolled up and down or left to right through the list.

The following Fig lists some of the common **ComboBox** properties and methods.

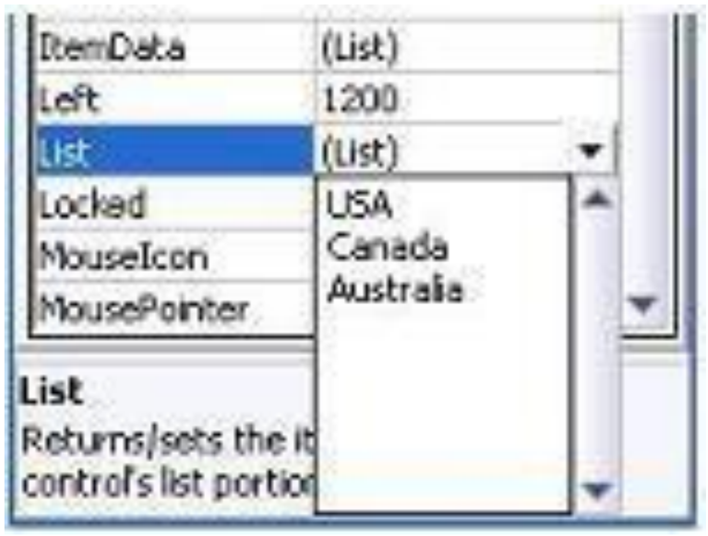
Property/Method	**Description**
Properties	
Enabled	By setting this property to True or False user can decide whether user can interact with this control or not
Index	Specifies the Control array index
List	String array. Contains the strings displayed in the drop-down list. Starting array index is 0.
ListCount	Integer. Contains the number of drop-down list items
ListIndex	Integer. Contains the index of the selected ComboBox item. If an item is not selected, ListIndex is -1
Locked	Boolean. Specifies whether user can type or not in the ComboBox

MousePointer	Integer. Specifies the shape of the mouse pointer when over the area of the ComboBox
NewIndex	Integer. Index of the last item added to the ComboBox. If the ComboBox does not contain any items , NewIndex is -1
Sorted	Boolean. Specifies whether the ComboBox's items are sorted or not.
Style	Integer. Specifies the style of the ComboBox's appearance
TabStop	Boolean. Specifies whether ComboBox receives the focus or not.
Text	String. Specifies the selected item in the ComboBox
ToolTipIndex	String. Specifies what text is displayed as the ComboBox's tool tip
Visible	Boolean. Specifies whether ComboBox is visible or not at run time
Methods	
AddItem	Add an item to the ComboBox
Clear	Removes all items from the ComboBox
RemoveItem	Removes the specified item from the ComboBox
SetFocus	Transfers focus to the ComboBox
Event Procedures	
Change	Called when text in ComboBox is changed
DropDown	Called when the ComboBox drop-down list is displayed
GotFocus	Called when ComboBox receives the focus
LostFocus	Called when ComboBox loses it focus

<u>Adding items to a List</u>

It is possible to populate the list at design time or run time

Design Time : To add items to a list at design time, click on List property in the property box and then add the items. Press CTRL+ENTER after adding each item as shown below.



Run Time : The AddItem method is used to add items to a list at run time. The AddItem method uses the following syntax.

Object.AddItemitem, Index

The ***item*** argument is a string that represents the text to add to the list

The ***index*** argument is an integer that indicates where in the list to add the new item. Not giving the index is not a problem, because by default the index is assigned.

Following is an example to add item to a combo box. The code is typed in the Form_Load event

```
Private Sub Form_Load()

Combo1.AddItem 1
Combo1.AddItem 2
Combo1.AddItem 3
Combo1.AddItem 4
Combo1.AddItem 5
Combo1.AddItem 6

End Sub
```

Removing Items from a List

The RemoveItem method is used to remove an item from a list. The syntax for this is given below.

Object.RemoveItem index

The following code verifies that an item is selected in the list and then removes the selected item from the list.

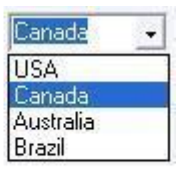
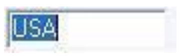
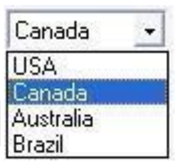
```
Private Sub cmdRemove_Click()
If List1.ListIndex > -1 Then
List1.RemoveItem List1. ListIndex
End If
End Sub
```

Sorting the List

The Sorted property is set to True to enable a list to appear in alphanumeric order and False to display the list items in the order which they are added to the list.

Using the ComboBox

A ComboBox combines the features of a TextBox and a ListBox. This enables the user to select either by typing text into the ComboBox or by selecting an item from the list. There are three types of ComboBox styles that are represented as shown below.

 Dropdown combo	 Simple combo	 Dropdown list

- Dropdown Combo (style 0)
- Simple Combo (style 1)
- Dropdown List (style 2)

The Simple Combo box displays an edit area with an attached list box always visible immediately below the edit area. A simple combo box displays the contents of its list all the time. The user can select an item from the list or type an item in the edit box portion of the combo box. A scroll bar is displayed beside the list if there are too many items to be displayed in the list box area.

The Dropdown Combo box first appears as only an edit area with a down arrow button at the right. The list portion stays hidden until the user clicks the down-arrow button to drop down the list portion. The user can either select a value from the list or type a value in the edit area.

The Dropdown list combo box turns the combo box into a Dropdown list box. At run time , the control looks like the Dropdown combo box. The user could click the down arrow to view the list. The difference between Dropdown combo & Dropdown list combo is that the edit area in the Dropdown list combo is disabled. The user can only select an item and cannot type anything in the edit area. Anyway this area displays the selected item.

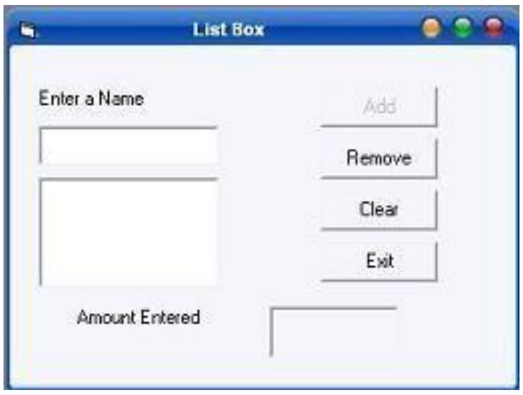
Example

This example is to Add , Remove, Clear the list of items and finally close the application.

- Open a new Standard EXE project is opened an named the Form as Listbox.frm and save the project as Listbox.vbp
- Design the application as shown below.

Object	Property	Settings
Form	Caption Name	ListBox frmListBox
TextBox	Text Name	(empty) txtName
Label	Caption Name	Enter a name lblName
ListBox	Name	lstName
Label	Caption Name	Amount Entered lblAmount
Label	Caption Name Border Style	(empty) lblDisplay 1 Fixed Single
CommandButton	Caption Name	Add cmdAdd
CommandButton	Caption Name	Remove cmdRemove
CommandButton	Caption Name	Clear cmdClear

CommandButton	Caption Name	Exit cmdExit



The following event procedures are entered for the TextBox and CommandButton controls.

```
Private Sub txtName_Change()
If (Len(txtName.Text) > 0) Then 'Enabling the Add button
'if atleast one character
'is entered
cmdAdd.Enabled = True
End If
End Sub

Private Sub cmdAdd_Click()
lstName.AddItem txtName.Text 'Add the entered the characters to the list box

txtName.Text = "" 'Clearing the text box

txtName.SetFocus 'Get the focus back to the
'text box

lblDisplay.Caption = lstName.ListCount 'Display the number of items in the list box

cmdAdd.Enabled = False ' Disabling the Add button

End Sub
```

The click event of the Add button adds the text to the list box that was typed in the Text box. Then the text box is cleared and the focus is got to the text box. The number of entered values will is increased according to the number of items added to the listbox.

```
Private Sub cmdClear_Click()
lstName.Clear
lblDisplay.Caption = lstName.ListCount
End Sub
```

```
Private Sub cmdExit_Click()
Unload Me
End Sub

Private Sub cmdRemove_Click()
Dim remove As Integer

remove = lstName.ListIndex 'Getting the index

If remove >= 0 Then 'make sure an item is selected
'in the list box

lstName.RemoveItem remove 'Remove item from the list box

lblDisplay.Caption = lstName.ListCount 'Display the number of items
'in the listbox

End If

End Sub
```

Remove button removes the selected item from the list as soon as you pressed the Remove button. The number of items is decreased in the listbox and the value is displayed in the label.

The code for the clear button clears the listbox when you press it. And the number of items shown in the label becomes 0.

When compared to TextBox controls, these controls are really simple. Not only do they expose relatively few properties, they also support a limited number of events, and you don't usually write much code to manage them.

Command Button Controls

Using Command Button controls is trivial. In most cases, you just draw the control on the form's surface, set its Caption property to a suitable string (adding an & character to associate a hot key with the control if you so choose), and you're finished, at least with user-interface issues. To make the button functional, you write code in its Click event procedure, as in this fragment:

```
Private Sub Command1_Click()
' Save data, then unload the current form.
Call SaveDataToDisk
Unload Me
End Sub
```

You can use two other properties at design time to modify the behavior of a CommandButton control. You can set the Default property to True if it's the default push button for the form (the button that receives a click when the user presses the Enter key—usually the OK or Save button). Similarly, you can set the Cancel property to True if you want to associate the button with the Escape key.

The only relevant CommandButton's run-time property is Value, which sets or returns the state of the control (True if pressed, False otherwise). Value is also the default property for this type of control. In most cases, you don't need to query this property because if you're inside a button's Click event you can be sure that the button is being activated. The Value property is useful only for programmatically clicking a button:

This fires the button's Click event.
Command1.Value = True

The CommandButton control supports the usual set of keyboard and mouse events (KeyDown, KeyPress, KeyUp, MouseDown, MouseMove, MouseUp, but not the DblClick event) and also the GotFocus and LostFocus events, but you'll rarely have to write code in the corresponding event procedures.

Properties of a CommandButton control

- To display text on a CommandButton control, set its *Caption* property.
- An event can be activated by clicking on the CommandButton.
- To set the background colour of the CommandButton, select a colour in the BackColor property.
- To set the text colour set the Forecolor property.
- Font for the CommandButton control can be selected using the Font property.
- To enable or disable the buttons set the Enabled property to True or False
- To make visible or invisible the buttons at run time, set the Visible property to True or False.
- Tooltips can be added to a button by setting a text to the Tooltip property of the CommandButton.

- A button click event is handled whenever a command button is clicked. To add a click event handler, double click the button at design time, which adds a subroutine like the one given below.

```
Private Sub Command1_Click( )
..................
End Sub
```

Option Button Control

Option Button controls are also known as radio buttons because of their shape. You always use Option Button controls in a group of two or more because their purpose is to offer a number of mutually exclusive choices. Anytime you click on a button in the group, it switches to a selected state and all the other controls in the group become unselected.

Preliminary operations for an Option Button control are similar to those already described for Check Box controls. You set an Option Button control's Caption property to a meaningful string, and if you want you can change its Alignment property to make the control right aligned. If the control is the one in its group that's in the selected state, you also set its Valueproperty to True. (The Option Button's Value property is a Boolean value because only two states are possible.) Value is the default property for this control.

At run time, you typically query the control's Value property to learn which button in its group has been selected. Let's say you have three OptionButton controls, named optWeekly, optMonthly, and optYearly. You can test which one has been selected by the user as follows:

```
If optWeekly.Value Then
' User prefers weekly frequency.
ElseIf optMonthly.Value Then
' User prefers monthly frequency.
ElseIf optYearly.Value Then
' User prefers yearly frequency.
End If
```

Strictly speaking, you can avoid the test for the last OptionButton control in its group because all choices are supposed to be mutually exclusive. But the approach I just showed you increases the code's readability.

A group of Option Button controls is often hosted in a Frame control. This is necessary when there are other groups of Option Button controls on the form. As far as Visual Basic is concerned, all the Option Button controls on a form's surface belong to the same group of mutually exclusive selections, even if the controls are placed at the opposite corners of the window. The only way to tell Visual Basic which controls belong to which group is by gathering them inside a Frame control. Actually, you can group your controls within any control that can work as a container—Picture Box, for example—but Frame controls are often the most reasonable choice.

Example

Open a new Standard EXE project and the save the Form as Option.frm and save the project as Option.vbp.

Design the Form as per the following specifications table.

Object	**Property**	**Settings**
Label	Caption Name	Enter a Number Label1
TextBox	Text Name	(empty) Text1
CommandButton	Caption Name	&Close Command1
OptionButton	Caption Name	&Octal optOct

OptionButton	Caption Name	&Hexadecimal optHex
OptionButton	Caption Name	&Decimal optDec

The application responds to the following events

- The change event of the TextBox reads the value and stores it in a form-level numeric variable.
- The click event of optOct button returns curretval in octal.
- The click event of the optHex button curerntval in hexadecimal
- The click event of the optDec button returns the decimal equivalent of the value held currentval.

The following code is entered in the general declarations section of the Form.

```
Dim currentval as variant
```

The variable is initialized to 0 by default. The change event procedure checks to ascertain the number system (Octal, Hexadecimal) that is in effect and then reads in the number.

```
Private Sub Text1_Change()
If optOct.Value = True Then
currentval = Val ("&O" & LTrim (Text1.Text) & "&")
Elseif optDec.value = True Then
currentval = Val (LTrim (Text1.Text) & "&")
Else
currentval = Val ("&H" & LTrim (Text1.Text) & "&")
End if
End Sub
```

The Val function is used to translate string to a number and can recognize Octal and Hexadecimal strings. The LTrim function trims the leading blanks in the text. The following code is entered in the click events of the OptionButton controls.

```
Private Sub optOct_Click()
Text1.Text = Oct(currentval)
End Sub

Private Sub optHex_Click()
Text1.Text = Hex(currentval)
End Sub

Private Sub optDec_Click()
Text1.Text = Format(currentval)
End Sub
```

The follwoing code is entered in the click event of teh Close button.

```
Private Sub cmdClose_Click()
Unlod Me
End Sub
```

The Application is run by pressing F5 or clicking on the Run icon in the tool bar. By pressing the Exit button the program is terminated.

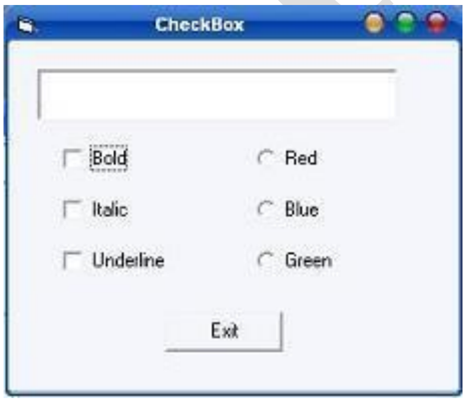
The following example illustrates the use of CheckBox control

* Open a new Project and save the Form as CheckBox.frm and save the Project as CheckBox.vbp

* Design the Form as shown below

Object	**Property**	**Setting**
Form	Caption	CheckBox

	Name	frmCheckBox
CheckBox	Caption Name	Bold chkBold
CheckBox	Caption Name	Italic chkItalic
CheckBox	Caption Name	Underline chkUnderline
OptionButton	Caption Name	Red optRed
OptionButton	Caption Name	Blue optBlue
OptionButton	Caption Name	Green optGreen
TextBox	Name Text	txtDisplay (empty)
CommandButton	Caption Name	Exit cmdExit



Following code is typed in the Click() events of the CheckBoxes

```
Private Sub chkBold_Click()
If chkBold.Value = 1 Then
txtDisplay.FontBold = True
Else
  txtDisplay.FontBold = False
End If
End Sub

Private Sub chkItalic_Click()
If chkItalic.Value = 1 Then
txtDisplay.FontItalic = True
Else
  txtDisplay.FontItalic = False
End If
End Sub

Private Sub chkUnderline_Click()
If chkUnderline.Value = 1 Then
txtDisplay.FontUnderline = True
Else
  txtDisplay.FontUnderline = False
End If
End Sub
```

Following code is typed in the Click() events of the OptionButtons

```
Private Sub optBlue_Click()
  txtDisplay.ForeColor = vbBlue
End Sub

Private Sub optRed_Click()
txtDisplay.ForeColor = vbRed
End Sub
```

```
Private Sub optGreen_Click()
txtDisplay.ForeColor = vbGreen
End Sub
```

To terminate the program following code is typed in the Click() event of the Exit button

```
Private Sub cmdExit_Click()
  End
End Sub
```

Run the program by pressing F5. Check the program by clicking on OptionButtons and CheckBoxes.

The PictureBox Control

PictureBox controls are among the most powerful and complex items in the Visual Basic Toolbox window. In a sense, these controls are more similar to forms than to other controls. For example, PictureBox controls support all the properties related to graphic output, including AutoRedraw, ClipControls, HasDC, FontTransparent, CurrentX, CurrentY, and all the Drawxxxx, Fillxxxx, and Scalexxxx properties. PictureBox controls also support all graphic methods, such as Cls, PSet, Point, Line, and Circle and conversion methods, such as ScaleX, ScaleY, TextWidth, and TextHeight. In other words, all the techniques that I described for forms can also be used for PictureBox controls (and therefore won't be covered again in this section).

Loading images

Once you place a PictureBox on a form, you might want to load an image in it, which you do by setting the Picture property in the Properties window. You can load images in many different graphic formats, including bitmaps (BMP), device independent bitmaps (DIB), metafiles (WMF), enhanced metafiles (EMF), GIF and JPEG compressed files, and icons (ICO and CUR). You can decide whether a control should display a border, resetting the BorderStyle to 0-None if necessary. Another property that comes handy in this phase is AutoSize: Set it to True and let the control automatically resize itself to fit the assigned image.

You might want to set the Align property of a PictureBox control to something other than the 0-None value. By doing that, you attach the control to one of the four form borders and have Visual Basic automatically move and resize the PictureBox control when the form is resized. PictureBox controls expose a Resize event, so you can trap it if you need to move and resize its child controls too.

You can do more interesting things at run time. To begin with, you can programmatically load any image in the control using the LoadPicture function:

```
Picture1.Picture = LoadPicture("c:\windows\setup.bmp")
```

and you can clear the current image using either one of the following statements:

```
' These are equivalent.
Picture1.Picture = LoadPicture("")
Set Picture1.Picture = Nothing
```

The LoadPicture function has been extended in Visual Basic 6 to support icon files containing multiple icons. The new syntax is the following:

```
LoadPicture(filename, [size], [colordepth], [x], [y])
```

where values in square brackets are optional. If filename is an icon file, you can select a particular icon using the size or colordepth arguments. Valid sizes are 0-vbLPSmall, 1-vbLPLarge (system icons whose sizes depend on the video driver), 2-vbLPSmallShell, 3-vbLPLargeShell (shell icons whose dimensions are affected by the Caption Button property as set in the Appearance tab in the screen's Properties dialog box), and 4-vbLPCustom (size is determined by x and y). Valid color depths are 0-vbLPDefault (the icon in the file that best matches current screen settings), 1-vbLPMonochrome, 2-vbLPVGAColor (16 colors), and 3-vbLPColor (256 colors).

You can copy an image from one PictureBox control to another by assigning the target control's Picture property:

```
Picture2.Picture = Picture1.Picture
```

The PaintPicture method

PictureBox controls are equipped with a very powerful method that enables the programmer to perform a wide variety of graphic effects, including zooming, scrolling, panning, tiling, flipping, and many fading effects: This is the PaintPicture method. (This method is also exposed by form objects, but it's most often used with PictureBox controls.) In a nutshell, this method performs a pixel-by-pixel copy from a source control to a destination control. The complete syntax of this method is complex and rather confusing:

```
DestPictBox.PaintPicture SrcPictBox.Picture, destX, destY, [destWidth], _
[destHeight], [srcX], [srcY2], [srcWidth], [srcHeight], [Opcode])
```

The only required arguments are the source PictureBox control's Picture property and the coordinates inside the destination control where the image must be copied. The destX / destY arguments are expressed in the ScaleMode of the destination control; by varying them, you can make the image appear exactly where you want. For example, if the source PictureBox control contains a bitmap 3000 twips wide and 2000 twips tall, you can center this image on the destination control with this command:

```
picDest.PaintPicture picSource.Picture, (picDest.ScaleWidth - 3000) / 2, _
(picDest.ScaleHeight - 2000) / 2
```

In general, Visual Basic doesn't provide a way to determine the size of a bitmap loaded into a PictureBox control. But you can derive this information if you set the control's AutoSize property to True and then read the control's ScaleWidth and ScaleHeight properties. If you don't want to resize a visible control just to learn the dimensions of a bitmap, you can load it into an invisible control, or you can use this trick, based on the fact that the Picture property returns an StdPicture object, which in turn exposes the Height and Width properties:

```
' StdPicture's Width and Height properties are expressed in
' Himetric units.
With Picture1
width = CInt(.ScaleX(.Picture.Width, vbHimetric, vbPixels))
height = CInt(.ScaleY(.Picture.Height, vbHimetric, _
vbPixels))
End With
```

By the way, in all subsequent code examples I assume that the source PictureBox control's ScaleWidth and ScaleHeight properties match the actual bitmap's size. By default, the PaintPicture method copies the entire source bitmap. But you can copy just a portion of it, passing a value for srcWidth and srcHeight:

```
' Copy the upper left portion of the source image.
picDest.PaintPicture picSource.Picture, 0, 0, , , , , _
picSource.ScaleWidth / 2, picSource.ScaleHeight / 2
```

If you're copying just a portion of the source image, you probably want to pass a specific value for the srcX and srcY values as well, which correspond to the coordinates of the top-left corner of the area that will be copied from the source control:

```
' Copy the bottom-right portion of the source image
' in the corresponding corner in the destination.
wi = picSource.ScaleWidth / 2
he = picSource.ScaleHeight / 2
picDest.PaintPicture picSource.Picture, wi, he, , , wi, he, wi, he
```

You can use this method to tile a target PictureBox control (or form) with multiple copies of an image stored in another control:

```
' Start with the leftmost column.
x = 0
Do While x < picDest.ScaleWidth
y = 0
' For each column, start at the top and work downward.
Do While y < picDest.ScaleHeight
picDest.PaintPicture picSource.Picture, x, y, , , 0, 0
' Next row
y = y + picSource.ScaleHeight
Loop
```

```
' Next column
x = x + picSource.ScaleWidth
Loop
```

Another great feature of the PaintPicture method lets you resize the image while you transfer it, and you can even specify different zoom-in and zoom-out factors for the x- and y-axes independently. You just have to pass a value to the destWidth and destHeight arguments: If these values are greater than the source image's corresponding dimensions, you achieve a zoom-in effect, and if they are less you get a zoom-out effect. For example, see how you can double the size of the original image:

```
picDest.PaintPicture picSource.Picture, 0, 0, _
picSource.ScaleWidth * 2, picSource.ScaleHeight * 2
```

As a special case of the syntax of the PaintPicture method, the source image can even be flipped along its x-axis, y-axis, or both by passing negative values for these arguments:

```
' Flip horizontally.
picDest.PaintPicture picSource.Picture, _
picSource.ScaleWidth, 0, -picSource.ScaleWidth
' Flip vertically.
picDest.PaintPicture picSource.Picture, 0, _
picSource.ScaleHeight, , -picSource.ScaleHeight
' Flip the image on both axes.
picDest.PaintPicture picSource.Picture, picSource.ScaleWidth, _
picSource.ScaleHeight, -picSource.ScaleWidth, -picSource.ScaleHeight
```

As you might expect, you can combine all these effects together, magnifying, reducing, or flipping just a portion of the source image, and have the result appear in any point of the destination PictureBox control (or form). You should find no problem in reusing all those routines in your own applications.

As if all these capabilities weren't enough, we haven't covered the last argument of the PaintPicture method yet. The opcode argument lets you specify which kind of Boolean operation must be performed on pixel bits as they're transferred from the source image to the destination. The values you can pass to this argument are the same that you assign to the DrawMode property. The default value is 13-vbCopyPen, which simply copies the source pixels in the destination control. By playing with the other settings, you can achieve many interesting graphical effects, including simple animations.

The Image Control

Image controls are far less complex than PictureBox controls. They don't support graphical methods or the AutoRedraw and the ClipControls properties, and they can't work as containers, just to hint at their biggest limitations. Nevertheless, you should always strive to use Image controls instead of PictureBox controls because they load faster and consume less memory and system resources. Remember that Image controls are windowless objects that are actually managed by Visual Basic without creating a Windows object. Image controls can load bitmaps and JPEG and GIF images.

When you're working with an Image control, you typically load a bitmap into its Picture property either at design time or at run time using the LoadPicture function. Image controls don't expose the AutoSize property because by default they resize to display the contained image (as it happens with PictureBox controls set at AutoSize = True). On the other hand, Image controls support a Stretch property that, if True, resizes the image (distorting it if necessary) to fit the control. In a sense, the Stretch property somewhat remedies the lack of the PaintPicture method for this control. In fact, you can zoom in to or reduce an image by loading it in an Image control and then setting its Stretch property to True to change its width and height:

```
' Load a bitmap.
Image1.Stretch = False
Image1.Picture = LoadPicture("c:\windows\setup.bmp")
' Reduce it by a factor of two.
Image1.Stretch = True
Image1.Move 0, 0, Image1.Width / 2, Image1.Width / 2
```

Image controls support all the usual mouse events. For this reason, many Visual Basic developers have used Image controls to simulate graphical buttons and toolbars. Now that

Visual Basic natively supports these controls, you'd probably better use Image controls only for what they were originally intended.

The Timer Control

A Timer control is invisible at run time, and its purpose is to send a periodic pulse to the current application. You can trap this pulse by writing code in the Timer's Timer event procedure and take advantage of it to execute a task in the background or to monitor a user's actions. This control exposes only two meaningful properties: Interval and Enabled. Interval stands for the number of milliseconds between subsequent pulses (Timer events), while Enabled lets you activate or deactivate events. When you place the Timer control on a form, its Interval is 0, which means no events. Therefore, remember to set this property to a suitable value in the Properties window or in the Form_Load event procedure:

```
Private Sub Form_Load()
Timer1.Interval = 500 ' Fire two Timer events per second.
End Sub
```

Timer controls let you write interesting programs with just a few lines of code. The typical (and abused) example is a digital clock. Just to make things a bit more compelling, I added flashing colons:

```
Private Sub Timer1_Timer()
Dim strTime As String
strTime = Time$
If Mid$(lblClock.Caption, 3, 1) = ":" Then
Mid$(strTime, 3, 1)= " "
Mid$(strTime, 6, 1) = " "
End If
lblClock.Caption = strTime
End Sub
```

You must be careful not to write a lot of code in the Timer event procedure because this code will be executed at every pulse and therefore can easily degrade your application's performance. Just as important, never execute a DoEvents statement inside a Timer event procedure because you might cause the procedure to be reentered, especially if the Interval property is set to a small value and there's a lot of code inside the procedure.

Timer controls are often useful for updating status information on a regular basis. For example, you might want to display on a status bar a short description of the control that currently has the input focus. You can achieve that by writing some code in the GotFocus event for all the controls on the form, but when you have dozens of controls this will require a lot of code (and time). Instead, at design time load a short description for each control in its Tag property, and then place a Timer control on the form with an Interval setting of 500. This isn't a time-critical task, so you can use an even larger value. Finally add two lines of code to the control's Timer event:

```
Private Sub Timer1_Timer()
On Error Resume Next
lblStatusBar.Caption = ActiveControl.Tag
End Sub
```

The Line Control

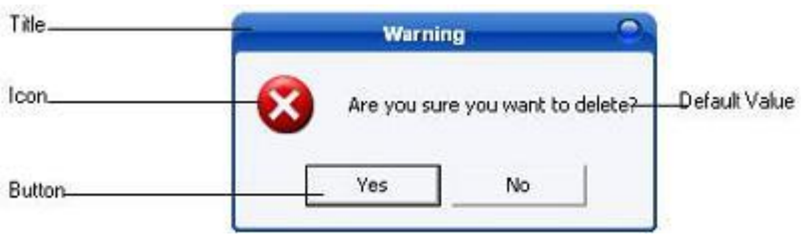
The Line control is a decorative control whose only purpose is let you draw one or more straight lines at design time, instead of displaying them using a Line graphical method at run time. This control exposes a few properties whose meaning should sound familiar to you by now: BorderColor (the color of the line), BorderStyle (the same as a form's DrawStyle property), BorderWidth (the same as a form's DrawWidth property), and DrawMode. While the Line control is handy, remember that using a Line method at run time is usually better in terms of performance.

The Shape Control

In a sense, the Shape control is an extension of the Line control. It can display six basic shapes: Rectangle, Square, Oval, Circle, Rounded Rectangle, and Rounded Square. It supports all the Line control's properties and a few more: BorderStyle (0-Transparent, 1-Solid), FillColor, and FillStyle (the same as a form's properties with the same names). The same performance considerations I pointed out for the Line control apply to the Shape control.

MESSAGE BOX :

Displays a message in a dialog box, waits for the user to click a button, and returns an **Integer**indicating which button the user clicked.



Syntax

MsgBox (*prompt*, [*buttons*,] [*title*,] [*helpfile*, *context*])

The **MsgBox** function syntax has these named arguments:

Part	**Description**
prompt	Required. String expression displayed as the message in the dialog box. The maximum length of *prompt* is approximately 1024 characters, depending on the width of the characters used. If *prompt* consists of more than one line, you can separate the lines by using a carriage return character (**Chr**(13)), a linefeed character (**Chr**(10)), or carriage return - linefeed character combination (**Chr**(13) & **Chr**(10)) between each line.
buttons	Optional. Numeric expression that is the sum of values specifying the number and type of buttons to display, the icon style to use, the identity of the default button, and the modality of the message box. If omitted, the default value for *buttons* is 0.
title	Optional. String expression displayed in the title bar of the dialog box. If you omit *title*, the application name is placed in the title bar.
helpfile	Optional. String expression that identifies the Help file to use to provide context-sensitive Help for the dialog box. If *helpfile* is provided, *context* must also be provided.
context	Optional. Numeric expression that is the Help context number assigned to the appropriate Help topic by the Help author. If *context* is provided, *helpfile* must also be provided.

Settings

The *buttons* argument settings are:

Constant	**Value**	**Description**
vbOKOnly	0	Display **OK** button only.

Constant	Value	Description
vbOKCancel	1	Display **OK** and **Cancel** buttons.
vbAbortRetryIgnore	2	Display **Abort**, **Retry**, and **Ignore** buttons.
vbYesNoCancel	3	Display **Yes**, **No**, and **Cancel** buttons.
vbYesNo	4	Display **Yes** and **No** buttons.
vbRetryCancel	5	Display **Retry** and **Cancel** buttons.
vbCritical	16	Display **Critical Message** icon.
vbQuestion	32	Display **Warning Query** icon.
vbExclamation	48	Display **Warning Message** icon.
vbInformation	64	Display **Information Message** icon.
vbDefaultButton1	0	First button is default.
vbDefaultButton2	256	Second button is default.
vbDefaultButton3	512	Third button is default.
vbDefaultButton4	768	Fourth button is default.
vbApplicationModal	0	Application modal; the user must respond to the message box before continuing work in the current application.
vbSystemModal	4096	System modal; all applications are suspended until the user responds to the message box.
vbMsgBoxHelpButton	16384	Adds **Help** button to the message box.
vbMsgBoxSetForeground	65536	Specifies the message box window as the foreground window.
vbMsgBoxRight	524288	Text is right-aligned.

Constant	**Value**	**Description**
vbMsgBoxRtlReading	1048576	Specifies text should appear as right-to-left reading on Hebrew and Arabic systems.

The first group of values (0-5) describes the number and type of buttons displayed in the dialog box; the second group (16, 32, 48, 64) describes the icon style; the third group (0, 256, 512) determines which button is the default; and the fourth group (0, 4096) determines the modality of the message box. When adding numbers to create a final value for the *buttons* argument, use only one number from each group.

The OLE Control

When OLE first made its appearance, the concept of Object Linking and Embedding seemed to most developers nothing short of magic. The ability to embed a Microsoft Word Document or a Microsoft Excel worksheet within another Windows application seemed an exciting one, and Microsoft promptly released the OLE control—then called the OLE Container control—to help Visual Basic support this capability.

In the long run, however, the Embedding term in OLE has lost much of its appeal and importance, and nowadays programmers are more concerned and thrilled about Automation, a subset of OLE that lets them control other Windows applications from the outside, manipulating their object hierarchies through OLE. For this reason, I won't describe the OLE control: It's a rather complex object, and a thorough description of its many properties, methods, and events (and quirks) would take too much space.

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
Established Under Section 3 of UGC Act 1956
COIMBATORE- 641021
DEPARTMENT OF COMMERCE COMPUTER APPLICATION

SUBJECT: SOFTWARE DEVELOPMENT WITH VISUAL BASIC **SUBJECT CODE: 17CCU501A**
SEMESTER: V **UNIT: III** **CLASS: III BCom CA**

S. NO	QUESTIONS	OPTION 1	OPTION 2	OPTION 3	OPTION 4	ANSWER
1	________ contains the text box and list box	combo box	shape control	image control	timer control	combo box
2	If the number of items exceed the value that can be displayed, ______ bars will automatically appear on the control	icon	option button	command button	scroll bars	scroll bars
3	The_______ method is used to add items to a list at run time.	item	index	remove item	add item	add item
4	The _______method is used to remove an item from the list	item	index	remove item	add item	remove item
5	The_______property sets the index number of the currently selected item	index number	list index	list count	none	list index
6	The ______ property returns the index of the last item added to the list	index number	list couont	new index	old index	new index
7	The sorted property is set to_____ to enable a list to appear in alphanumeric order	0	1	TRUE	FALSE	TRUE
8	The sorted property is set to _____ to display the items in the order in which they are added to the list	0	1	TRUE	FALSE	FALSE
9	_______ is the style of dropdown combo box	style 0	style 2	style 3	style 1	style 0
10	_______ is the style of simple combo box	style 0	style 1	style 3	style 2	style 1
11	_______ is the style of dropdown list box	style 0	style 1	style 2	style 3	style 2

12	_______ box saves the space on a form	list box	tool box	combo box	none	combo box
13	The______ property represents the minimum value in the scroll bar	min	max	minimum	maximum	min
14	The ______ property represents the maximum value in the scroll bar	min	max	minimum	maximum	max
15	_______ provides easy navigation through a list of items or a large amount of information	scroll bar	command button	tool bar	tool box	scroll bar
16	The style property in ______ tab allows us to set the appearance of the control	line style	control	general	special	general
17	The _____ property is used to set the style of the lines displayed between nodes	line style	special style	general style	node	line style
18	In a tree view control ______ is always better to first se the name property with a prefix	twv	tvw	wvt	vwt	tvw
19	In tree view control 0 indicates_____ line	tree	root	style	none	tree
20	In tree view control 1 indicates ____ line	tree	root	style	none	root
21	The_____property is a Boloean property that allows us to enable of disable the automatic label editing feature of the control	label edit	line edit	enable	disable	label edit
22	The _______ property is to the name of an existing image list control if pictures are to be displayed in tree view control	line edit	image list	image edit	none	image list
23	_______ configures the control for either manual / automatic dragging	OLE drag mode	OLE drop mode	label edit	image list	OLE drag mode
24	The ________ property allows us to set or retrive the delimiter character used for the path returned by a node's full path property	path seperator	seperator	indentation	none	path seperator
25	______ uses to display the results of query on a DataBase.	tree view control	view control	tree control	none	tree view control
26	______ is the extension for the Bitmap files	.Btp	.BMP	.bmp	.dbs	.bmp
27	A ________ bar control is a frame that can consist of several panels, which informs the user about the status of an application.	control bar	status bar	image bar	picture bar	status bar

28	An_______is an object that we place on a form to enable or enhance a user's interaction with an application.	Active X control	Active Y control	Active Z control	none	Active X control
29	An _________ is an object that we place on a form to enable or enhance a user's interaction with an application.	tabstrip	strip	tab	none	tabstrip
30	______ control serves as a visual and functional container for controls	form	frame	Ole	ADO	frame
31	________ displays a true/false of yes/no option	box	command button	text box	check box	check box
32	_______ control is used link or embed on object, display and manipulate data from other windows based applications	Ole	ADO	DAO	none	Ole
33	_______ control adds a shape to a form	image	picture	shape	none	shape
34	_______ Box allows the user to select directories and paths which are displayed	Dir list	list	tool	Dir tool	Dir list
35	The _______ button control which is a part of an option group aoolws the user to select one option even if it displays multiploe choices	command	option	check	image	option
36	_______ box displays the valid disk drives and allows the use to select one of them	Dir list	Drive list	list Drive	none	Drive list
37	_______ box displays a set of files from which a user can select the lesired one	Drive list box	file list box	picture box	Dir list box	file list box
38	_______ control draws a straight line to the form.	line	circle	oval	rectangle	line
39	_______ control enable the user to connect to an existing DataBase and display information from it.	data base	data	file	list	data
40	_______ used in groups to display multiple choices from which the user can select one or more.	option button	check box	combo box	label box	check box
41	An _______ control is the rectangular portion into which picture files can be loaded.	line	shape	image	none	image
42	A bitmap also called _______ graphics defines an image as a pattern of dots	paint type	circle type	oval type	drawing type	paint type
43	VB provides _______ controls for creating graphical applications.	1	2	3	4	3

44	_______ method sets the colour of the individual pixels	color	shape	control	none	color
45	_______ method sets the colour of an individual pixel	set color	set pixel	set method	none	set method
46	OLE stands for _________	object linker and embedd	object linking and embedded	object linking and embedding	object linker and embedded	object linking and embedding
47	DDE stands for _________	dynamic data exchange	dynemer data exchange	dynamic datum exchange	dynamic data exchanger	dynamic data exchange
48	________ actually transfers control to the original application	ADO	DAO	OLE	DDE	OLE
49	The ________ function can be used for creating the object in code	create object	get object	both	none	both
50	The form we work with during design time is a _______	class	module	instance	sub routine	class
51	The OLE control can have only _______ object at a time.	one	two	three	four	one
52	Each time an OLE control is drawn on a form_______ object dialog box appears	delete	add	insert	none	insert
53	Paste special dialog box can be used to create an object during _______ time.	design	run	execution	view	design
54	The _______ method cab be used to specify an empty embedded object at runtime.	create embed	empty embed	OLE container	none	create embed
55	The _______ method is used to display the insert object dialog box	obj dlg insert	insert obj dlg	dlg obj insert	none	insert obj dlg
56	_______ property determines whether the OLE drop operations are allowed or not	OLE drop allowed property	OLE drop not allowed property	OLE drop mode property	VB OLE drag automatic property	OLE drop allowed property
57	The ________ parameter describes the format of the data stored in the data parameter	object	data format	create	insert	data format
58	_______ configures the Tree View control to enable / disable Ole drop operations	OLE drag mode	OLE drop mode	label edit	image list	OLE drop mode

59	The _______ property determines the horizontal distance between nodes in the view	path seperator	seperator	indentation	none	indentation
60	______ function specifies the file name and assigns the picture to the picture property.	load picture	add picture	remove picture	none	load picture

UNIT-IV

SYLLABUS

DAO – Creating a Database – Types of Record Set – ActiveX Data Object (ADO)

DAO

DAO (Data Access Objects) is an application program interface (API) available with Microsoft's Visual Basic that lets a programmer request access to a Microsoft Access database. DAO was Microsoft's first object-oriented interface with databases. DAO objects encapsulate Access's Jet functions. Through Jet functions, it can also access other Structured Query Language (SQL) databases.

Data Access Objects (DAO) provides data access to native Microsoft Jet engine databases (.mdb files), selected ISAM databases, and any ODBC data source. Historically, DAO is a popular solution when it comes to using Microsoft® Access (.mdb) and ISAM data sources such as Btrieve, FoxPro, Paradox, and dBase.
The general characteristics of DAO are:

- Difficulty in coding.
- Flexibility, with facilities to access many different data sources.
- Adequate-to-slow performance.
- Dynamic Data Language (DDL) functionality.
- Support for complex cursors.

Compared to the newer ActiveX Data Objects (ADO) or Remote Data Objects (RDO) technologies, Data Access Objects (DAO) is a slower, less capable data access alternative. DAO (and its companion, the Microsoft Jet database engine) was originally designed to handle remote ISAM data access. DAO is tied to the Microsoft Jet engine because it uses the Microsoft Jet engine query and result set processors.

Connecting Data Control to Database

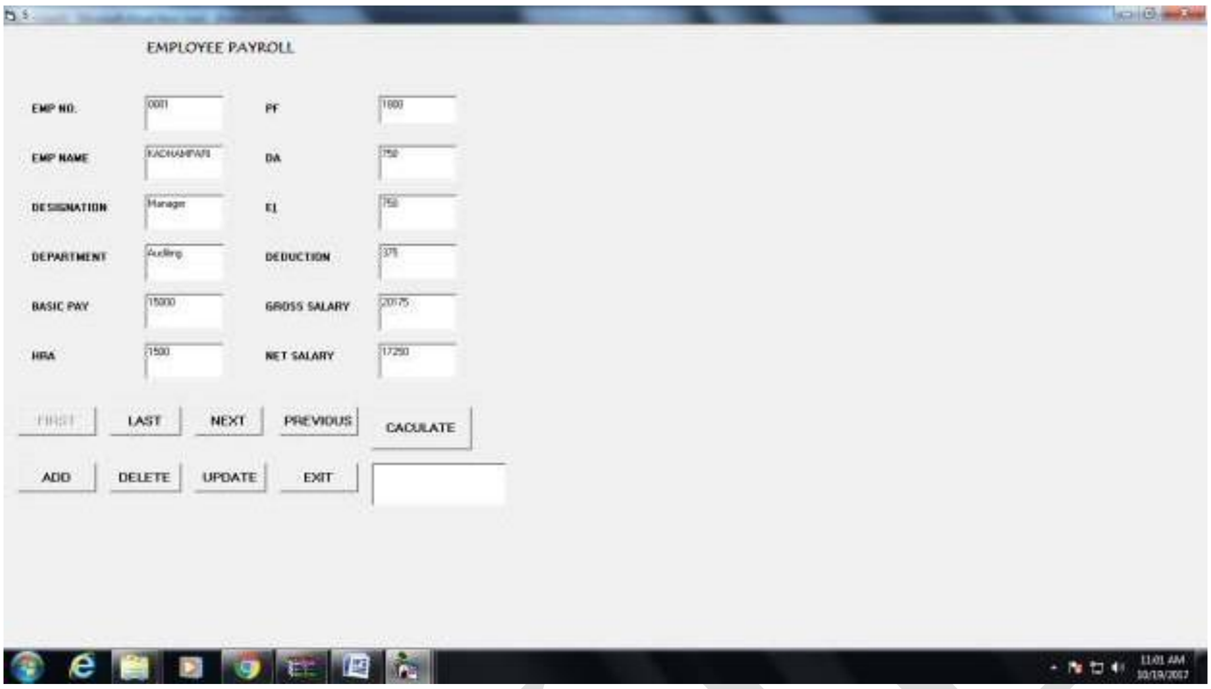
To connect the data control to this database, double-click the DatabaseName property in the Properties window and then click on the button with three dots on the rightto open a file selection dialog. From the dialog, search the folders of your hard drive to locate the database file NWIND.MDB. It is usually placed under Microsoft Visual Studio\VB98\ folder, Select the aforementioned file and now your data control is connected to this database file.

The next step is to double-click on the RecordSource property to select the customers table from the database file NWIND.MDB, You can also change the caption of the data control to anything, we use Click to browse Customers. After that, we will place a label and change its caption to Customer Name. In addition, insert another label and name it as cus_name and leave the label empty as customers' names will appear here when we click the arrows on the data control. We need to bind this label to the data control for the application to work. To do this, open the label's DataSource and select data_navigator that will appear automatically. One more thing that we need to do is to bind the label to the correct field so that data in this field will appear on this label. To do this, open the DataField property and select ContactName.

Example program for database connectivity, Employee Payslip

```
Private Sub Command1_Click()
Adodc1.Recordset.MoveNext
MsgBox "This is the next record"
End Sub

Private Sub Command2_Click()
Adodc1.Recordset.MovePrevious
MsgBox "This is the previous  record"
End Sub

Private Sub Command3_Click()
Adodoc1.Recordset.AddNew
Text1.Text = " "
Text2.Text = " "
Text3.Text = " "
Text4.Text = " "
Text5.Text = " "
Text6.Text = " "
```

```
Text7.Text = " "
MsgBox "The record is added successfully"
End Sub

Private Sub Command4_Click()
Adodc1.Recordset.Delete
MsgBox "The record is deleted"
End Sub

Private Sub Command5_Click()
Adodc1.Recordset.Update
 MsgBox "The record is updated"
End Sub

Private Sub Command6_Click()
End
End Sub


Private Sub Command7_Click()
Text6.Text = Val(Text5.Text) * 10  / 100
Text7.Text = Val(Text5.Text) * 12  / 100
Text8.Text = Val(Text5.Text) * 5  / 100
Text9.Text = Val(Text5.Text) * 5  / 100
Text10.Text = Val(Text5.Text) * 2.5  / 100
Text11.Text = Val(Text5.Text) + Val(Text6.Text) + Val(Text7.Text) + Val(Text8.Text) +
Val(Text9.Text) + Val(Text10.Text)
Text12.Text = Val(Text11.Text) - Val(Text10.Text) - Val(Text9.Text) - Val(Text7.Text)
End Sub
```


EMPLOYEE PAYROLL

EMP NO.	0001	PF	1800
EMP NAME	KADHAMPARI	DA	750
DESIGNATION	Manager	EL	750
DEPARTMENT	Auditing	DEDUCTION	375
BASIC PAY	15000	GROSS SALARY	20175
HRA	1500	NET SALARY	17250

ActiveX Data Object

• The ADO (ActiveX Data Object) data control is the primary interface between a Visual Basic application and a database. It can be used without writing any code at all! Or, it can be a central part of a complex database management system. This icon may not appear in your Visual Basic toolbox. If it doesn't, select Project from the main menu, then click Components. The Components window will appear. Select Microsoft ADO Data Control, then click OK. The control will be added to your toolbox.

• As mentioned in Review and Preview, previous versions of Visual Basic used another data control. That control is still included with Visual Basic 6.0 (for backward compatibility) and has as its icon:

Make sure you are not using this data control for the work in this class. This control is suitable for small databases. You might like to study it on your own.

• The data control (or tool) can access databases created by several other programs besides Visual Basic (or Microsoft Access). Some other formats supported include Btrieve, dBase, FoxPro, and Paradox databases.

• The data control can be used to perform the following tasks:

1. Connect to a database.

2. Open a specified database table.

3. Create a virtual table based on a database query.

4. Pass database fields to other Visual Basic tools, for display or editing. Such tools are bound tools (controls), or data aware.

5. Add new records or update a database.

6. Trap any errors that may occur while accessing data.

7. Close the database.

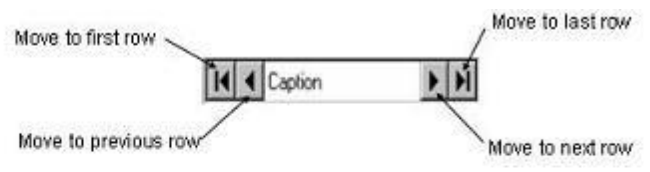
• Data Control Properties:

Align	Determines where data control is displayed.
Caption	Phrase displayed on the data control.
ConnectionString	Contains the information used to establish a connection to a database.
LockType	Indicates the type of locks placed on records during editing (default setting makes databases read-only).
Recordset	A set of records defined by a data control's ConnectionString and RecordSource properties. Run-time only.

RecordSource Determines the table (or virtual table) the data control is attached to.

• As a rule, you need one data control for every database table, or virtual table, you need access to. One row of a table is accessible to each data control at any one time. This is referred to as the current record.

• When a data control is placed on a form, it appears with the assigned caption and four arrow buttons:

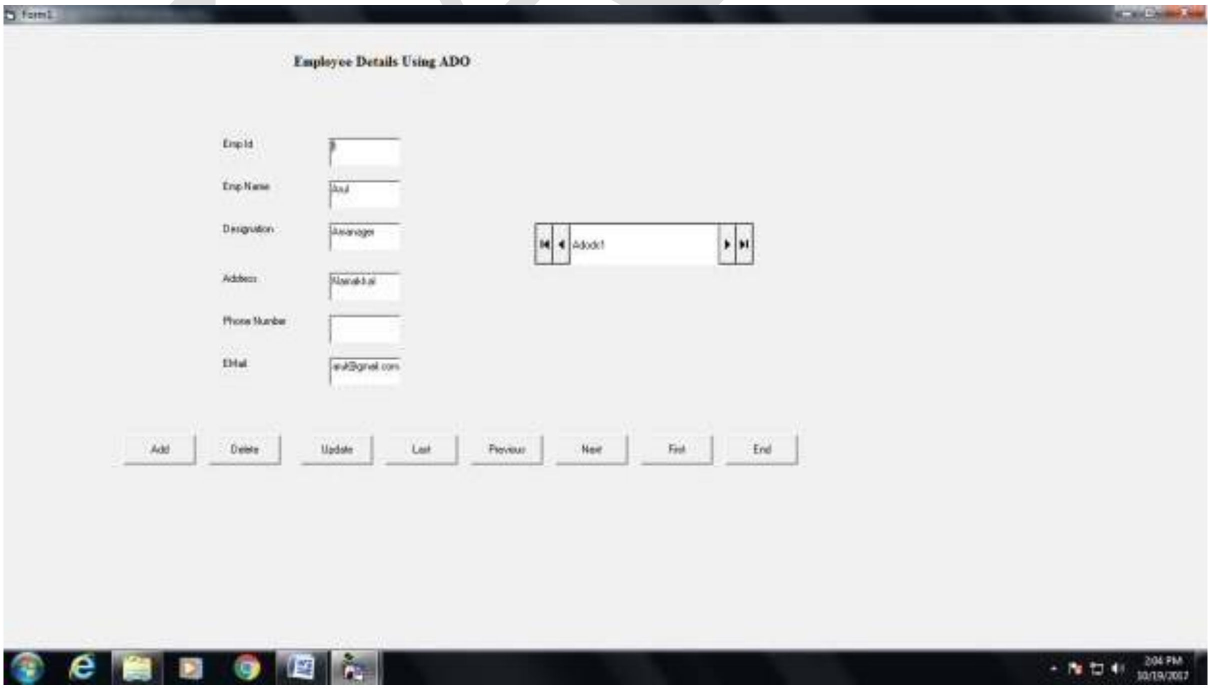


The arrows are used to navigate through the table rows (records). As indicated, the buttons can be used to move to the beginning of the table, the end of the table, or from record to record.

Example program for Ado connectivity,

```
Private Sub Command1_Click()
Adodc1.Recordset.MoveNext
MsgBox "This is the next record"
End Sub

Private Sub Command2_Click()
Adodc1.Recordset.MovePrevious
MsgBox "This is the previous  record"
End Sub

Private Sub Command3_Click()
Adodoc1.Recordset.AddNew
Text1.Text = " "
Text2.Text = " "
Text3.Text = " "
```

```
Text4.Text = " "
Text5.Text = " "
Text6.Text = " "
Text7.Text = " "
MsgBox "The record is added successfully"
End Sub

Private Sub Command4_Click()
Adodc1.Recordset.Delete
MsgBox "The record is deleted"
End Sub

Private Sub Command5_Click()
Adodc1.Recordset.Update
 MsgBox "The record is updated"
End Sub

Private Sub Command6_Click()
End
End Sub
```



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Form Design

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
Established Under Section 3 of UGC Act 1956
COIMBATORE- 641021
DEPARTMENT OF COMMERCE COMPUTER APPLICATION

SUBJECT: SOFTWARE DEVELOPMENT WITH VISUAL BASIC **SUBJECT CODE: 17CCU501A**
SEMESTER: V **UNIT: V** **CLASS: III BCom CA**

S. NO	QUESTIONS	OPTION 1	OPTION 2	OPTION 3	OPTION 4	ANSWER
1	Visual Basic can be used to compile class-based projects such as _________ components.	Active X	Active Y	Active Z	None	Active Y
2	An Active X DLL is an_____________process server.	in	out	up	down	in
3	Active X components are______________, that can be used with other applications.	file make	object servers	compilation	none	object servers
4	_______________is imperative that we trap run time errors in our project	error checking	error finding	error catching	none	error checking
5	Active server pages are basically _________ pages that contain VB script code, which is executed on the server	C	C++	VB	HTML	HTML
6	_________communicates with data sources through the JET database engine	Data Access Objects	data control	cointainer	relations	Data Access Objects
7	_______ binds data-aware controls to microsoft access and other ODBC data sources.	DAO	ADO	Data control	Data	Data control

8	______ provides a framework for using code to create and manipulate components of a remote ODBC DataBase system	RDO	RDC	ODBC	VBSQL	RDO
9	_______binds the control of a ODBC remote DataBase .	RDO	RDC	ODBC	VBSQL	RDC
10	____________is an API call interface to the open DataBase connectivity libraries and drivers to provide data access to Orcale	RDO	RDC	ODBC	VBSQL	ODBC
11	________ is an implementation of the DataBase library API specifically designed to provide access to an SQL server through a VB application.	RDO	RDC	ODBC	VBSQL	VBSQL
12	_________is a programming model that eliminates the need to choose from among DAO and RDO	ADO	RDC	ODBC	DB	ADO
13	A data access object is a collection of classes that model the structure of a relational database system.	module	procedure	object	programe	object
14	The_________object corresponds to a stored table definition.	DataBase	TableDef	QueryDef	Record set	TableDef
15	The is a stored query definition , which is a pre compiled SQL statement.	DataBase	TableDef	QueryDef	Record set	QueryDef
16	The record set object corresponds to a ___ view into a database table or the results of a query.	cursored	pointer	manual	none	cursored
17	A cursored view is one that stores rows of data in buffer and points to one row of data at a time called record	previous	next	side	current	current
18	The _______ object represents a parameter associated with a query def object created form a parameter query.	index	user object	parameter	paranthesis	parameter
19	A _________ object includes information about one instance of a type of object.	group	relation	property	document	document

20	A ______ object represents a built-in characteristic or a user defined characteristic of a DAO.	property	group	document	relation	property
21	A ______ object holds information describing the objects that are grouped into that container.	container	holder	DataBase	DataBase object	container
22	There are ____________ types of DAO libraries supported by Visual Base 6.0.	1	2	3	4	2
23	To open an existing database , the _________method of the workspace object is used.	open database	create database	database	none	open database
24	A_________is an object that contains a set of records from database.	set	records	record set	none	record set
25	The method moves to the first row in the record set.	move first	move next	move previous	move last	move first
26	The _________method moves to the last row in the record set.	move first	move next	move previous	move last	move next
27	The________ method moves to the previous row in the record set.	move first	move next	move previous	move last	move previous
28	The _______ method moves to the last row in the record set.	move first	move next	move previous	move last	move last
29	The ______ property is True when the user moves beyond the last record in the record set.	EOF	BOF	Both	none	EOF
30	The ________ property is True when the user has moved to a position before the first record in the record set.	EOF	BOF	Both	none	BOF
31	Modifying and Deleting records are used to________ a record in a record set.	manipulate	edit	change	modify	manipulate
32	The ____________method can be used to locate a record in a table type record set.	open	close	store	seek	seek
33	The________ method is used to perform action queries.	open	close	store	execute	execute
34	New fields can be added or existing fields can be deleted using the _______ methods respectively on	append	delete	a or b	a and b	a or b

	the Tabledef object.					
35	The __________ command is used to add rows to a table.	add	insert	sub	delete	insert
36	___________is a low-level object-based programming interface designed to access a wide variety of data sources and also not restricted to ISAM.	ADO	DAO	OLEDB	RDO	OLEDB
37	__________ objects is the object-based interface to OLEDB.	Active X data	Active Y data	Active Z data	none	Active X data
38	_________window shows all the current connections we have built to databases, as well as any data environment connections that have been added by user.	Data view window	Data report designer	Query designer	Data environment designer	Data view window
39	___________ supports page and report headers , detail lines and many other common features, including a variety of graphics and font features.	Data view window	Data report designer	Query designer	Data environment designer	Data report designer
40	The __________ designer enables us to design queries save them in our DataBase.	Dataview window	Data report	Query	Data Environment	Query
41	With the help of ____________ Designer, we can link it to all our databases, tables and Queries with a single object.	Dataview window	Data report	Query	Data Environment	Data Environment
42	The _____ can actually write real ADO code that is designed to browse records in the same way as the old data contsl could.	Data form wizard	Data view window	Query	Data Environment	Data form wizard
43	RDO is _____________	Remote Data Objects	Remotes Data Objects	Remote Datum Objects	Remote Data Objecting	Remote Data Objects
44	_______ method is used to create a new record in the record set.	add new	create new	new add	none	add new
45	_______ method can be used to delete an existing record in dynaset of table type record set.	delete method	delete existing	delete	none	delete method

46	The _______ method is used to retrive data from the tables.	execute	run	stop	open record set	open record set
47	_________ method is usde to open a table Dynaset of Snapshot record set from the tabledef object	open record set	create record set	open table	create table	open record set
48	________ method updates and refreshes any attached table links for the tabledef object.	new link	fresh link	refresh link	none	refresh link
49	__________ method is used to create and store a user-defined property.	create index	create property	create field	create table	create property
50	__________ method is used to add an index to the table def object.	add index	new index	create index	fresh index	create index
51	________ method is used to ass a new field to an existing tabledef object.	add field	new field	create field	fresh field	create field
52	________ queries are SQL statements that perform specific actions on the database.	SQL	action	calculation	None	action
53	A ________ is a collection of users with similar access rights.	set	gang	group	object	group
54	A _________object represents a relationship between fields in tables or queries.	property	document	relation	None	relation
55	The_______ object is used to define and enforce database security.					
56	The________object corresponds to a column of data type and set of properties.	field	Table	Query	record	field
57	DataBase is the variable that represents the _________ object.	database	visual basic	HTML	DHTML	database
58	________ type of record set is identical to the snapshot record set except that we can only scorll forward through its record.	Backward only type record set	Reverse only type record set	Forward only type record set	none	Forward only type record set
59	The_______ type record set can refer to any table, attached table or query.	snap shot	backward	forward	dynaset	snap shot
60	A _______ type record set cannot be update and does not reflect any changes made by the users.	dynaset	forward	backward	snap shot	snap shot

UNIT-V

SYLLABUS

Data Report: Data Environment – Designer – Connection Object – Command Object – Data Report Control – Sections of Report Design. Case Study: Automated System for student mark list – Automated System for Railway reservation.

Data Environment

In this chapter, we will understand how to use Data Environment, which was introduced in Visual Basic 6.0, how to use DataCombo, which is a data-bound ActiveX control, and how to use DataGrid, which is also a data-bound ActiveX control.

Let us understand each of them first. Then we will develop a data-entry screen using all these three.

Data Environment

Data Environment object is created and managed using Data Environment designer. A Data Environment object can accomplish any of the following tasks.

• Can contain connection and command objects
• Can establish relationship between command object to represent hierarchies
• Can group data and get aggregates
• Allows fields to be dragged and dropped on to a Data Report, for report, and a Form for data entry screen
• Can work as source for Databound control such as DataCombo controls and Hierarchical Flexgrid control.

In order to work with Data Environment object, you have to add Data Environment Designer to your project. Data Environment Designer allows programmer to accomplish any of the tasks mentioned above. Data Environment Designer is invoked when you double click on Data Environment object in Project Explorer.

To add Data Environment object to the project:

1. Select Project-> Add Data Environment. If Add Data Environment option is not found then select More ActiveX Designers and then select Data Environment.

Note: Visual Basic adds Data Environment Designer to your project and also creates a connection object.

Data Environment Designer

Working with Connection Object

Whenever you create a Data Environment object a Connection object is added to Data Environment object. But that Connection object is not connected to any database. So first we have to establish a connection with the Connection object. Now, let us see how to connect to database through Connection object.

To connect to Biblio.mdb using connection object:

1. Select Connection object (Connection1) and click on right button.
2. From popup menu select Properties option

Data Environment designer displays Data Link properties dialog.

3. Select the required OLEDB provider (Microsoft Jet 3.51 OLE DB Provider)
4. Select Connection tab and select the name of the database (BIBLIO.MDB)
5. Click on Ok

To rename connection object:

1. Invoke popup menu by click on Connection object with right button.
2. Select Rename option.
3. Enter new name and press enter key to confirm it.

Creating Command Object

After connection is established using Connection object, now we have to create a command object to access the data of the database. A connection object can contain any number of command objects. In fact, a command object can contain another command object, which is called as child command object.

To create command object to get data from Authors table:

1. Invoke popup menu of Connection object and select Add Command option
Data Environment Designer creates a command object with name Command1.
2. Invoke Popup menu of command object by clicking on right button and select Properties option.
Properties dialog is displayed
3. Change the Name of the command object to Authors
4. Select Table as Database Object
5. Invoke the list of tables by clicking on down arrow of Object Name drop down and select Authors as the name of the table.
6. For the time being, ignore remaining tabs and click on OK.

Properties of Command object.

A command object is created with the default name (command1). If you expand the command object by clicking on + sign, you get the columns of AUTHORS table.

Data Environment designer after a command object is created.

To create master-detail relationship:

One of the interesting features of Data Environment object is, it allows you to create hierarchy of objects.

To understand how to create hierarchy of command objects, let us create two command objects. One for Publishers table and another for Titles table.

Publishers command object becomes parent command and Titles command object becomes child command object. These hierarchies can be used straightaway in Hierarchical FlexGrid control and Data Report object.

To create command object for Publishers:

1. Select connection object, Biblio, and click on right button to invoke popup menu and select Add Command option of popup menu.
2. After a command object is created invoke its properties by selecting Properties option from Popup menu.
3. Change Name of the command object to Publishers
4. Choose Table as the Database Object and select Publishers as the name of the object.
5. Click on Ok.

To create child command object for Titles:

1. Select Publishers command object and invoke popup menu.
2. Select Add Child Command option.
3. A new command object is created and placed along with fields of Publishers command object.
4. Select Child command object and invoke its properties
5. Change name to Titles.
6. Choose Table as Database Object and Titles as the name of the database object.
7. Click on Relation tab to set relationship between Publishers and Titles command object.
8. Make sure Parent Fields and Child Fields are set to PubID and click on Add button to establish relationship between Publishers and Titles based on PubId field.
9. Click on Ok.

After child object is created, Data Environment Designer has three command objects – Authors, Publishers, and Titles. Where Authors and Publishers are at the same level (Parent objects), Titles is a child command object of Publishers command object. When you expand all command objects, Data Environment Designer

Data Environment Designer after three command objects are added.

Data Combo and Data List controls

DataCombo and DataList controls are used to present a list of values to users from which user can select one. The list of values to be displayed to user will come from one recordset and the selected value goes into another recordset.

Note: Whenever I refer to DataCombo, it also refers to DataList, unless the difference is explicitly specified.

As DataCombo is an ActiveX control, it is to be loaded into its project explicitly. And DataCombo is based on OLEDB interface. So it can be used with either Data Environment or ActiveX data control, because they are also based on OLEDB (use ADO).

To load Data List controls:

1. Select Project->Components
2. Visual Basic displays a list of available ActiveX controls.
3. Turn on check box on the left of Microsoft DataList Controls 6.0 (OLEDB)
4. Click on OK.

Two ActiveX controls are loaded into project – DataList and DataCombo.

Note: You also have Microsoft Data Bound List Controls 6.0 ActiveX control. It contains DBList and DBCombo, which work with Data Control and not with OLEDB. If you are developing a project with only DAOs or RDOs, then you can use these controls.

The following are the important properties that are specific to Data List controls (Data Combo and Data List).

Property Meaning
BoundColumn Contains the name of the source field in the Recordset object that is used to supply a data value to another Recordset to which control is bound.
ListField Returns or sets the name of the field in the Recordset object, specified by the RowSource property, used to fill the DataCombo or DataList control's list portion.

RowSource Sets a value that specifies the source from which the control's list is filled. The source is either an ActiveX Data control or Data Environment.
RowMember Returns or sets the data member to be used to display list text. Used when RowSource is a Data Environment.
BoundText Returns or sets the value of the field specified by the BoundColumn property.
DataSource Contains an object to which control is bound. It is generally ADODC or Data Environment.
DataMember Specifies the data member of Data Environment to which control is bound.
DataField Specifies the name of the field to which control is bound.
DataChanged Determines whether data in the control has been changed by any process.
Style Determines the behavior and appearance of the control. Applicable only to DataCombo.
MatchedWithList Returns True if the current content of the BoundText property matches one of the records in the list portion of the control.
SeletedItem Returns a value containing a bookmark for the selected record in a DataCombo or DataList control.
VisibleItems Returns an array of bookmarks, one for each visible item in the DataCombo or DataList control's list.
VisibleCount Returns a value indicating the number of visible items in the list portion of the DataCombo or DataList control.
MatchEntry Returns or sets a value indicating how the DataCombo or DataList control performs searches based on user input.
Table 20.1: Properties of DataList control.

Note: See Sample Data Entry screen later in this chapter to understand how to use various properties of the control.

DataGrid Control
Allows you to display and manipulate a set of records and columns taken from the specified recordset. You can specify whether you want to allow user to modify displayed data, add new records, and delete existing records.

The following are a few features supported by DataGrid control.

It supports the following features:

• Each cell contains a value. The value of the cell can be edited interactively by user or programmatically.
• Provides Columns collection using which you can access columns of the grid. When you select a column ColIndex property is set to enable you to access the columns selected by the user.
• Data in the current row can be accessed through Bookmark property, which provides access to underlying recordset object's record.
• Each column can have its own display attributes
• The DataGrid control functions similarly to the DBGrid (which is based on DAO & RDO) control except that it doesn't support an unbound mode.

The following are the important methods, properties and events of DataGrid control.

Methods of DataGrid control
The following are the methods that are specific to DataGrid.

Method	Meaning
CaptureImage	Returns a captured image of the grid's display in its current state.
ClearFields	Clears all fields and restores grid to two columns and two rows.
ClearselCols	Deselects all the columns that are currently selected.
HoldFields	Sets the current column/field layout as the customized layout.
ColContaining	Returns the ColIndex value of the DataGrid control column containing the specified coordinate (X) value.
GetBookmark	Takes a relative row and returns the bookmark of the relative row. If GetBookmark 1 is given then the bookmark of next row of the current row is given.
Rebind	Causes the DataGrid control to reset the columns, headings and other properties based on the current Data control properties.
RowBookmark	Returns a value containing a bookmark for a visible row in the DataGrid control.
RowContaining	Returns a value containing a bookmark for a visible row in the DataGrid

control.
RowTop Returns a value containing the Y coordinate of the top of a specified row of a DataGrid control
Scroll Scrolls the DataGrid control horizontally and vertically in a single operation. You have to specify the number of rows and number of columns to scroll.
Table 20.2: Methods of DataGrid control.

To put an image of the DataGrid in an image box:

```
Image1.picture = DataGrid1.captureImage
```

To get the row and columns of the current mouse pointer:

X and Y are coordinates of Mouse pointer

```
RowValue = DataGrid1.RowContaining(Y)
colValue = DataGrid1.ColContaining(X)
```

Properties of DataGrid control
The following are important properties of DataGrid.

Property Meaning
AllowArrows Sets or returns a value that determines whether the control uses the arrow keys for grid navigation.
AproxCount Returns the approximate number of rows in the grid.
CurrentCellModified Sets or returns modification status of the current cell. If it is true, it means current cell, identified by BookMark and Col properties, is modified.
CurrentCellVisible Returns true if current cell is visible.
EditActive Determines the current editing status of the current cell in the grid. Setting it to true will initiate editing of current cell. Setting it to false ends editing. Changing its value will automatically fire relevant events.

TabAction Sets or returns a value that defines the behavior of the tab key. Valid values are: 0 - tab moves out of grid, 1- tab moves between cells in the same row, but once row changes then control moves out of grid, 2 – tab moves amount cells.

WrapCellPointer Determines whether moving right on the last column will move control to first column of the next row (True) or not (False).

AllowAddnew,

AllowDelete,

AllowUpdate Determines whether the corresponding action will be allowed.

Columns Returns a collection of column objects.

DataChanged Returns true, if data in the grid is changed.

Firstrow Contains the bookmark of the first visible row in the grid.

Leftcol Contains the number of the column that is to be displayed as the left-most column of the grid.

SelBookMarks Returns a collection of bookmarks for all the selected rows.

VisibleCols Returns the number of visible columns in the grid.

VisibleRows Returns the number of visible rows.

RowHeight Sets the height of all rows in datagrid.

Table 20.3: Properties of DataGrid control.

Events of DataGrid control

The following are events of DataGrid control.

Event When is it fired?

AfterColEdit After the editing of a cell is over. This event occurs after BeforeColUpdate and AfterColUpdate events.

BeforeColEdit Just before the user enters a character to enter into edit mode. Set Cancel property to True, to prevent user from editing the cell.

Coledit When user has entered into edit mode. Occurs immediately after BeforeColEdit event.

Error When a data access error has taken place.

OnAddNew When an action invokes an AddNew operation. The AddNew operation is invoked by either entering a character in a new record or by programmatically changing the data in new record.

SelChange When user selects a different range of rows or columns.

AfterColUpdate After data is moved from a cell in the DataGrid control to the control's copy buffer.

BeforeColUpdate After editing is completed in a cell, but before data is moved from the cell to the DataGrid control's copy buffer.

AfterDelete, AfterUpdate,

AfterInsert After the corresponding operation has taken place.

BeforeDelete, BeforeUpdate,

BeforeInsert Before the corresponding operation takes place.

Table 20.4: Events of DataGrid control.

The following are a few examples using events, methods and properties of datagrid control.

To take confirmation before a record is deleted from grid:

```
Private Sub DataGrid1_BeforeDelete (Cancel As Integer)
Dim mResult As Integer
mResult = MsgBox("Are you sure that you want to delete " &
DataGrid1.Selbookmarks.count & " record?", _
vbYesNo + vbQuestion, "Delete Confirmation")
‘ cancel deletion, if user click on NO button
If mResult = vbNo Then Cancel = True
End Sub
```

Listing 20.1: Code to take confirmation before record is deleted.

To prevent from entering a date that is less than today's date:

```
Private Sub DataGrid1_BeforeColUpdate (ColIndex As Long, OldValue As
Variant, Cancel As Integer)
If ColIndex = 1 Then
```

If DataGrid1.Columns(1).Value < Now Then Cancel = True MsgBox "You must enter a date that is later than today." End If End If End Sub Listing 20.2: Code to check whether entered date is less than current date. Creating a Data Entry screen Let us create a sample data entry screen to take the details of a sales transaction. We will use a Data Environment to access the data. DataCombo is used to provide list of products to user so that user can select one from the list of products. The data entry screen also provides the complete details of all the products upon user's request. For this we use a DataGrid. The following are the various major steps involved in creating this application. • Creating Data Environment • Designing Form • Writing Code Creating Data Environment The following are the steps required to create new application , add Data Environment and create required objects in Data Environment . 1. Start a new project using File -> New Project and select Standard Exe as the project type.

2. Add a Data Environment object by selecting Project -> Add Data Environment.
3. Change the Name of Data Environment to DenvProducts.
4. Click right mouse button on Connection object to invoke popup menu and select properties option to invoke Data Link Properties.
5. Select Microsoft Jet 3.51 OLE DB Provider as OLE DB provider.
6. Select Connection tab and choose Products.mdb as the database.
7. Click on OK to close Data Link Properties.
8. Invoke popup menu of Connection object and select Add Command to add a command object.
9. A new Command object will be created with the name Command1.
10. Select Command object and invoke its properties.
11. Change the following properties of the command1 object.

Name Products
Database Object Table
Object Name Products

12. Invoke popup menu of Connection object again and select Add Command option.
13. A new command object will be created again.
14. Change the following properties of the newly created command object.

Name Sales
Database Object Table
Object Name Sales

After both the command objects are created, the Data Environment designer should look like this.

Data Environment designer after two command objects are created.

Designing form

After we have created required objects in Data Environment, let us now concentrate on placing the required controls on the form and changing their properties. In this application we have to have two forms. One is automatically added to the project as it is a Standard Exe project. So we have to create only one form. We will concentrate on second form a bit later. First let us place required controls on the first form.

Before we proceed let us load two ActiveX controls that will be used in this project.

To Load DataList control into project:

1. Select Project -> Components.
2. Visual Basic displays Components dialog with list of available ActiveX controls.
3. Check Microsoft DataList Controls 6.0 (OLEDB)
4. Click on Ok

Note: DataList consists of DataList control and DataCombo control.

To Load DataGrid control into project:

1. Select Project -> Components

Visual Basic displays Components dialog with list of available ActiveX controls.

2. Check Micorsoft DataGrid Controls 6.0 (OLEDB)
3. Click on Ok

Designing first form (Data Entry)

Designing data entry screen involves the following steps.

1. Open the Form and the Data Environment designer and place them side by side.
2. Drag Fields (QTYSOLD, RPU and DISCOUNT) from Data Environment designer to Form.
3. When you drag and drop a field from Data Environment Designer to Form, a textbox for

field and a label control for the name of the field will be created on the form at the position where you dropped the field.

If you look at the properties of textbox that is created when you drag and drop a field of Data Environment on the form, you find the following properties already set by Data Environment. These properties make the textbox bound to Data Environment.

The properties for qtysold are:

DataSource	DenvProducts
Datamember	Sales
DataField	QtySold

Using DataCombo control

1. Place DataCombo control on the from .
2. And change the following properties.

Property	Value
Name	DcmbProdno
BoundColumn	Prodno
ListField	Proddesc
DataField	Prodno
DataMember	Sales
DataSource	Denvproducts
RowSource	Denvproducts
RowMember	Products
Style	2-dbcDropdownlist

DataCombo box is used to get the list of products from Products command of Data Environment. It displays product description (listField is proddesc) but when user selects an item it takes the corresponding product number (boundcolumn is prodno).

The data combo box is bound to prodno field (datafield is prodno) of Sales command object (datamember is Sales) of the Data Environment (datasource is Denvproducts). As the result whatever product number is selected by the user that is copied into prodno field of Sales table.

That is all about DataCombo control.

1. Add a line at the bottom of the form using Line tool.
2. Add four command buttons and arrange them.
3. Change the properties of the form and command buttons as follows.

Object Property Value
Form1 Name FrmSales
Caption Sales Entry Form
BorderStyle 3-Fixed Dialog
Command1 Name CmdSave
Caption &Save
Default True
Command2 Name CmdCancel
Caption &Cancel
Cancel True
Command3 Name CmdList
Caption &Products List
Command4 Name CmdQuit
Caption &Quit

That's all we have so far as the data entry form is concerned. We will write code later. It is time to design our second form in which we display the details of products using datagrid.

Designing second form (List form)

1. First, make sure you have second form added to your project. If not, add a form using Project->Add Form.
2. Place DataGrid control and a command button on the from.
3. Change the properties as follows.

Object	Property	Value
Form2	Name	FrmProdList
	Caption	Products List
	BorderStyle	3-Fixed Dialog
Command1	Name	CmdClose
	Caption	&Close
DataGrid1	DataSource	DenvProducts
	DataMember	Products
	AllowUpdate	false

After properties of DataGrid are changed, change the size of data grid so that all columns of the grid can be displayed to user.

To resize grid to the size of columns:

1. Invoke Popup menu for DataGrid and select Retrieve Fields option.
2. DataGrid takes columns information from data source (Data Environment) and resizes the columns of the grid to the required size.
3. Now resize the grid in such a way that user can view all the columns. where DataGrid is resized by leaving some area on the right side for scrollbar.

Writing Code
Before we write code let us understand what are the important events for us, and what we do when those events occur.

Event Required Action
Selecting Save button Saves the current record to SALES table and creates a new blank

record. It also decreases QOH in Products table by qtysold.
Selecting Cancel button Erases the data already entered and keeps the form ready for new record.
Selecting ProductList button Displays frmProdList form, which displays the details of the products.
Selecting Quit button Terminates the application.(RPU)
Selecting a product form DataCombo control Immediately displays the rate per unit of the selected product.
Moving out of qtySold item Checks whether the entered amount of qty is really existing in the Products table.
Clicking on a row in DataGrid Places the selected product into dcmbProdno of the frmSales form so that when you come back you do not have to repeat the selection of the same product.
Selecting Close button of frmProdList Closes the form and returns to qtySold field of frmSales.
Table 20.5: Events to which we need to respond in sample application.

Code for frmSales form
Here is the code to take required actions for various events in frmSales.

```
Private Sub cmdCancel_Click()
With DenvProducts.rsSales
.CancelUpdate
.AddNew
ClearFields
End With
End Sub

Private Sub cmdList_Click()

frmprodlist.Show vbModal
' goto txtqtysold text box
txtqtysold.SetFocus
```

```
End Sub

Private Sub cmdSave_Click()
With DenvProducts.rsSales
' save current record
.Update
UpdateProducts
.AddNew
ClearFields
End With
End Sub

Private Sub Cmdquit_Click()
Unload Me

End Sub

Private Sub dcmbProdno_Change()
GetRate
End Sub

Private Sub dcmbProdno_Click(Area As Integer)
GetRate
End Sub

Private Sub Form_Activate()

With DenvProducts.rsSales
If .EditMode = adEditNone Then
.AddNew
End If
End With
End Sub

Public Sub ClearFields()

txtqtysold.Text = ""
txtrpu.Text = ""
txtdiscount.Text = ""
dcmbProdno.SetFocus

End Sub

Private Sub txtqtysold_Validate(Cancel As Boolean)
' check whether quantity is sufficient
If txtqtysold.Text = "" Then
Exit Sub
End If

If Not check_qty Then
Cancel = True
End If
End Sub

Public Function check_qty() As Boolean

' get quantity on hand for the selected product

With DenvProducts.rsProducts
.Bookmark = dcmbProdno.SelectedItem
qoh = .Fields("qoh").Value
If qoh < CInt(txtqtysold.Text) Then
MsgBox "Insufficient Quantity on Hand"
check_qty = False
Else
```

```
check_qty = True
End If

End With
End Function

Public Sub GetRate()
If Not dcmbProdno.MatchedWithList Then
Exit Sub
End If
' get rate and put that into txtRpu
' move to the required record
With DenvProducts.rsProducts
.Bookmark = dcmbProdno.SelectedItem
txtrpu.Text = .Fields("rpu").Value
End With
End Sub

Public Sub UpdateProducts()
' Decrease QOH of PRODUCTS table by QTYSOLD
With DenvProducts.rsProducts
.Bookmark = dcmbProdno.SelectedItem
.Fields("qoh") = .Fields("qoh") - CInt(txtqtysold.Text)
.Update
End With
End Sub
```

Listing 20.3: Code for frmSalesEntry form

Code for frmProdList form

Here is the code for frmProdList form. The code takes care of placing selected product number into dcmbprodno of frmSales. Close button closes the form and control goes back to frmSales.

```
Private Sub cmdClose_Click()
Unload Me
End Sub

Private Sub DataGrid1_Click()
' pass the selected product number to data entry screen
frmSales.dcmbProdno.BoundText = DataGrid1.Columns(0).Value

End Sub
```