

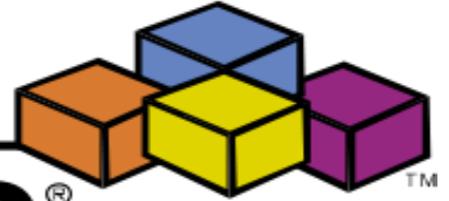


Computer Sheet

Prep3

Microsoft®

Visual Basic®



Microsoft
Visual Studio



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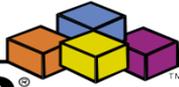
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What the difference between data & information?

<u>Data</u>	<u>Information</u>
It is the raw material for information . Like : (Number , letters, Images , Sound , Video)	It is the result of processing data by analyzing and forming .

What is the different between high level Languages and machine Language ?

<u>Machine Language</u>	<u>High Level Language</u>
Which (0 - 1)	Programming Language enable to write in English .

What is the different between Compiler and interpreter ?

<u>Compiler</u>	<u>Interpreter</u>
Translated into machine Language before any attempt to execute it	Convert the high level language to machine
Faster	Slower
Error are more difficult to find .	If an error the interpretation process stops and an error message is displayed

Variables:- Values in the memory can change.

Algorithm :- The steps logic to solve the problem



Chapter One

Problem Solving :-

The problem is defined as the objective or the specific output that we want to attain; through a sequence of steps and activities and, specific input.

Consider the following :- (Baking a cake)

Input ----- (eggs ,flour , milk ...)

Processing ----- (Blender)

Output----- (Cake)

1) Define the problem.

Identification of required outputs, available inputs and, arithmetic and logical operations to be executed.

(required output, input, arithmetic & logical operation)

2) Performing step by step instruction (Algorithm)to solve a problem .(Flowchart)

Algorithm is defined as a group of logically arranged procedures to be executed to attain a goal or precise output, out of specific inputs.

3) Program design .

Having drawn a “Flowchart”, to solve the problem, using a computer; we have to translate this flowchart into one of the programming languages.

4) Program Testing. (Check the errors).

Therefore we check the errors and debug them.

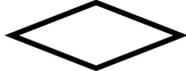
5) Program documenting . (Save)

last modification of the program and, people who contribute to the program development process, to have the program documented to go back feedback and correction.



Flowchart :-

Flowchart is a diagram that uses standard graphical symbols; to illustrate the sequence of steps required for solving a problem or specific question.

Significance	Symbol
	Terminal (Start \ End)
	(Input - Output)
	Processing
	Decision
	Flow Lines



Activity (1-2)

Write down the Algorithm, and draw a flowchart to calculate the area of a circle whose radius "R" is known, bearing in mind that the equation of the area is: $Area = 3.14 * R * R$.

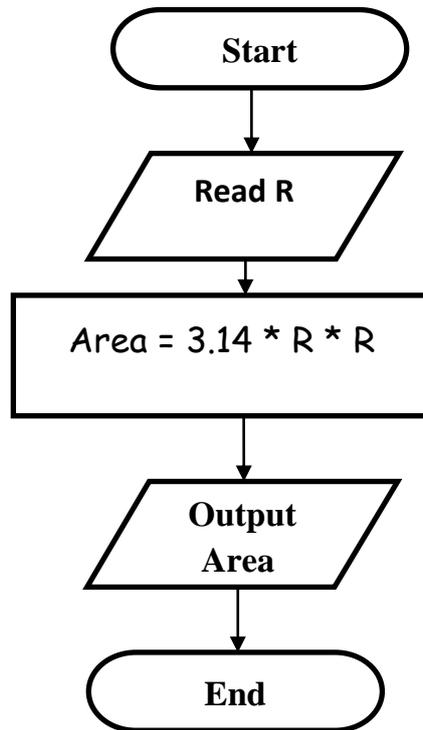
Answer :-

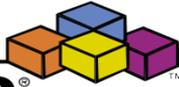
Output : Area of a Circle

Input : R , radius

Solution : $Area = 3.14 * R * R$

Algorithm
.....
.....
.....
.....
.....
.....
.....
.....
.....





Activity (1-3)

Write down the Algorithm, and draw a flowchart to calculate the number of years, bearing in mind that the number of months is known.

Answer :-

Output : numbers of years (1year=12m)

Input : number of months M

Solution : $Y = M / 12$

Solution : Area = $3.14 * R * R$

Algorithm

.....

.....

.....

.....

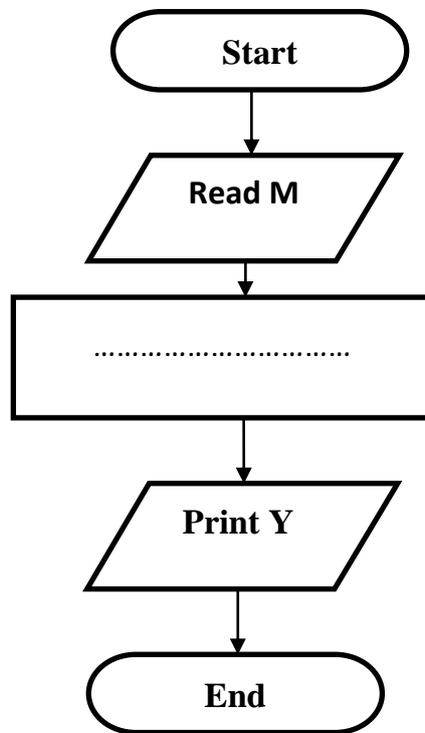
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The use of Branching (Decision)in flowchart :-

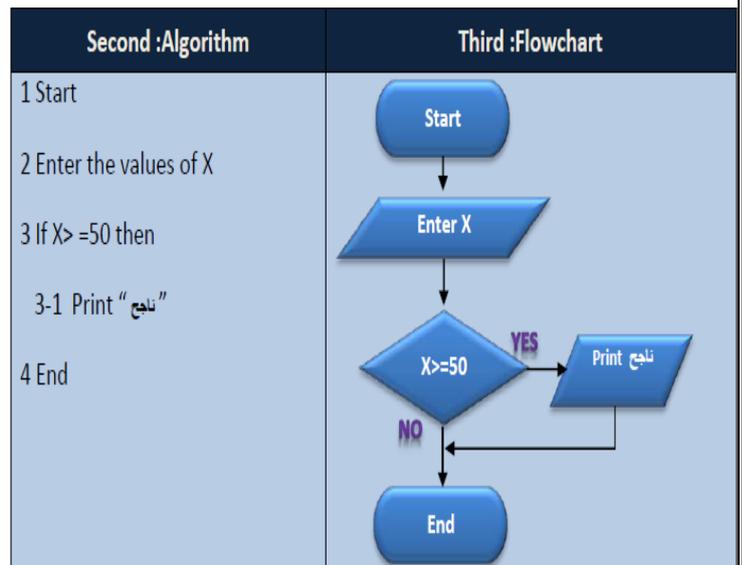
Where two possible answers are available a "yes" and a "no", in a flowchart the decision point has two paths (branches), you can also find more than two answers.

EX (1):-

Output: print the word "ناجح".

Input: the score X.

Solution: If the value of X is greater than or equal 50; the word "ناجح" will be printed.



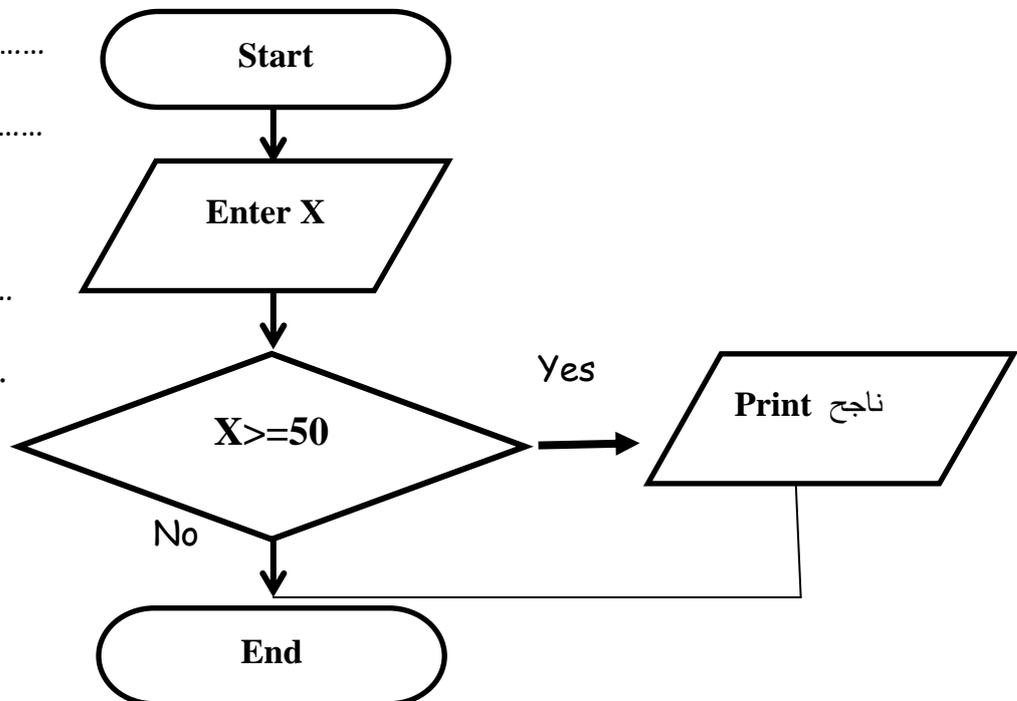
Output:.....

Input:.....

Processing :

.....

.....





EX (2):-

Draw A flowchart for a program that will calculate the division of two numbers . Determine whether the divisor equal (Zero) and display the message "Unknown "

Output: print the result of dividing two numbers "R" or print the word "غير معرف"

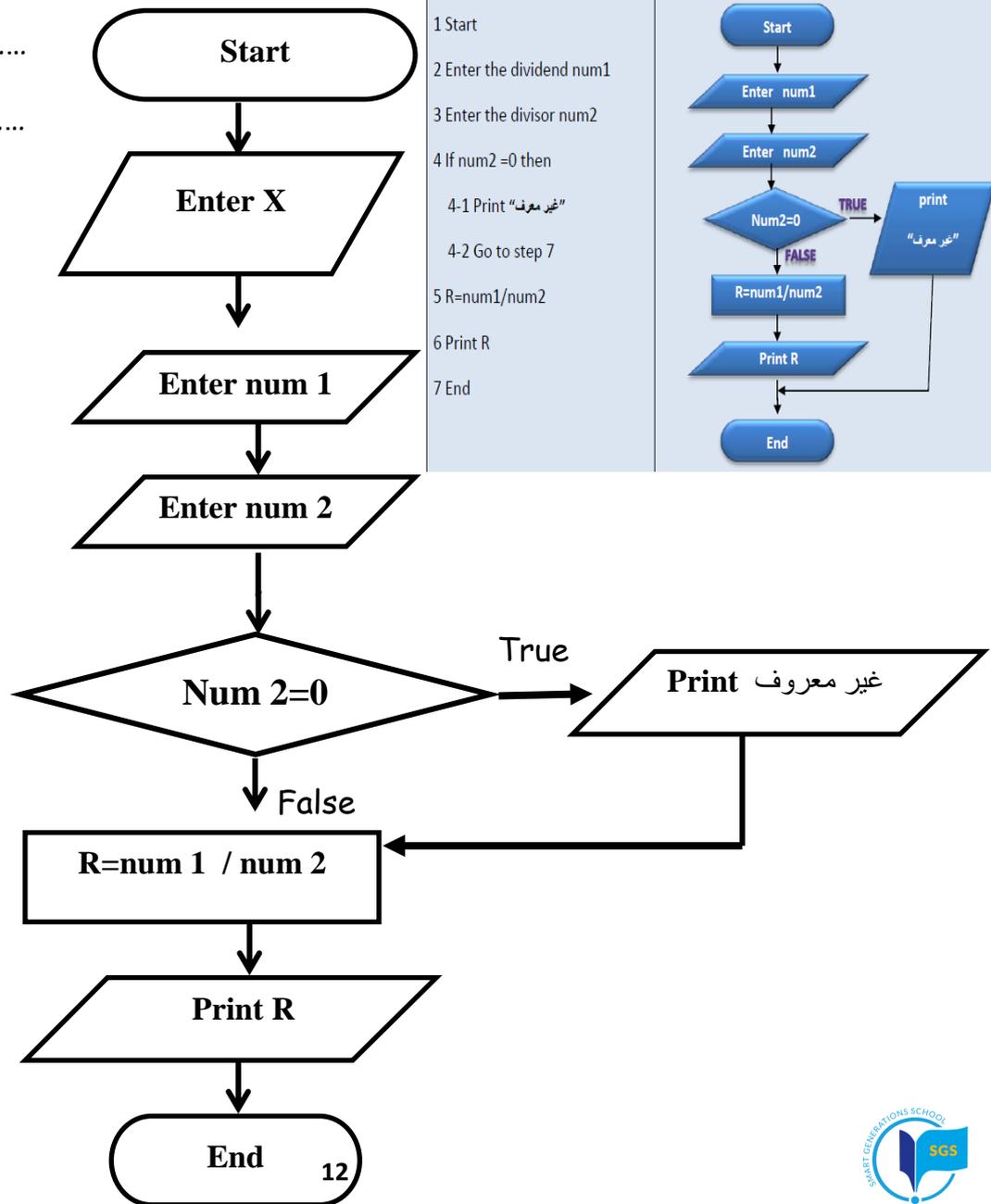
Input: the dividend is "num1", and the divisor is "num2".

Solution: if num2=0 then print "غير معرف" , otherwise print the result of the division "R". printed.

Output:.....

Input:.....

Processing :
.....



Second :Algorithm	Third :Flowchart
1 Start	Start
2 Enter the dividend num1	Enter num1
3 Enter the divisor num2	Enter num2
4 If num2 =0 then	Num2=0
4-1 Print "غير معرف"	TRUE → print "غير معرف"
4-2 Go to step 7	FALSE → R=num1/num2
5 R=num1/num2	R=num1/num2
6 Print R	Print R
7 End	End



EX (3):-

Draw A flowchart for a program that obtains a number from the user.

Determine the number type (even or odd) and print the result.

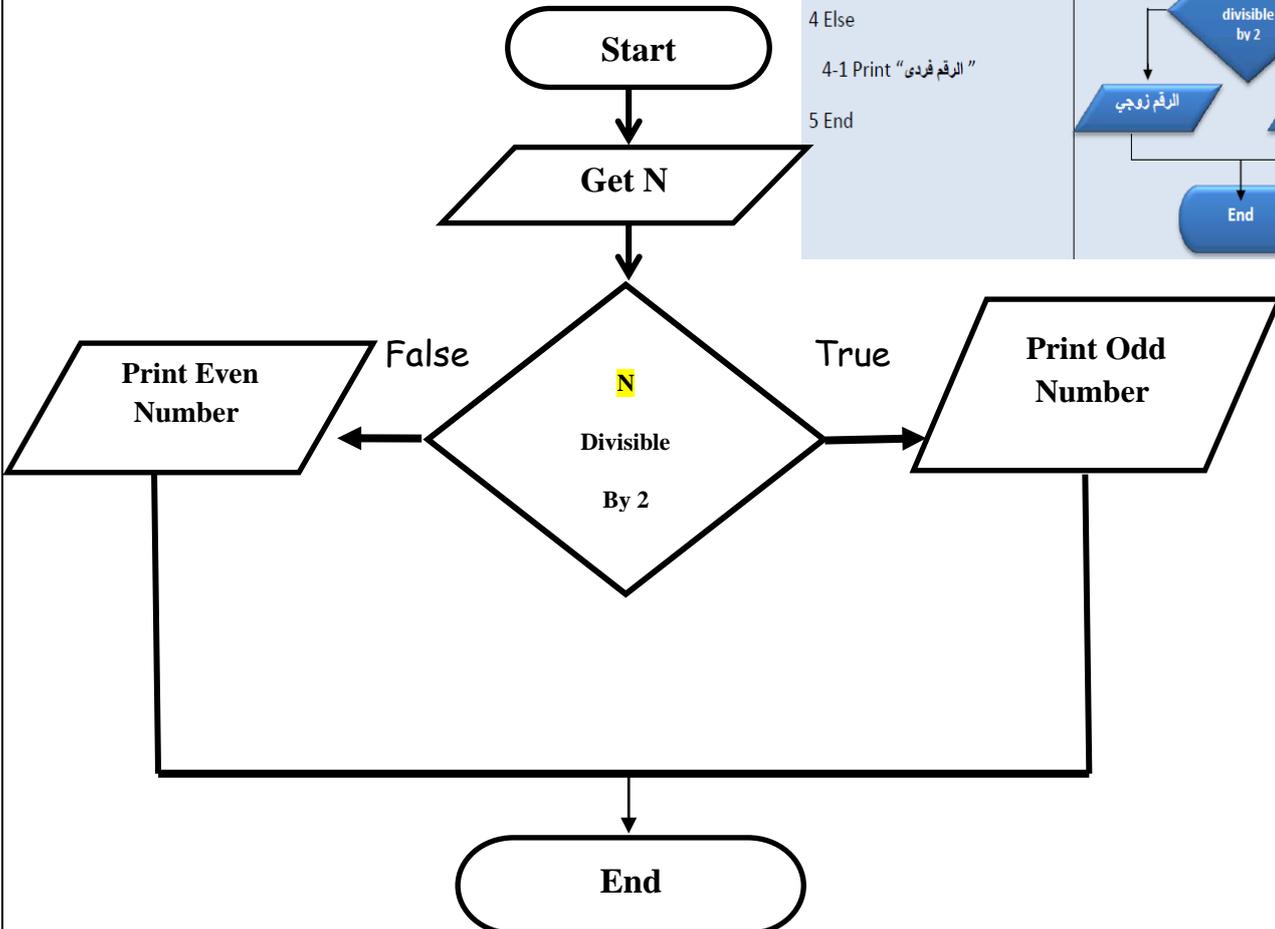
Answer :-

Output : The number type (Even or Odd)

Input : Number "N"

Solution : If "N" is divisible by 2 then the number is "Even" Else number is "Odd"

Second :Algorithm	Third :Flowchart
1 Start	
2 Enter N	
3 If N is divisible by 2 without remainder then	
3-1 Print "الرقم زوجي"	
4 Else	
4-1 Print "الرقم فردي"	
5 End	





EX (4):-

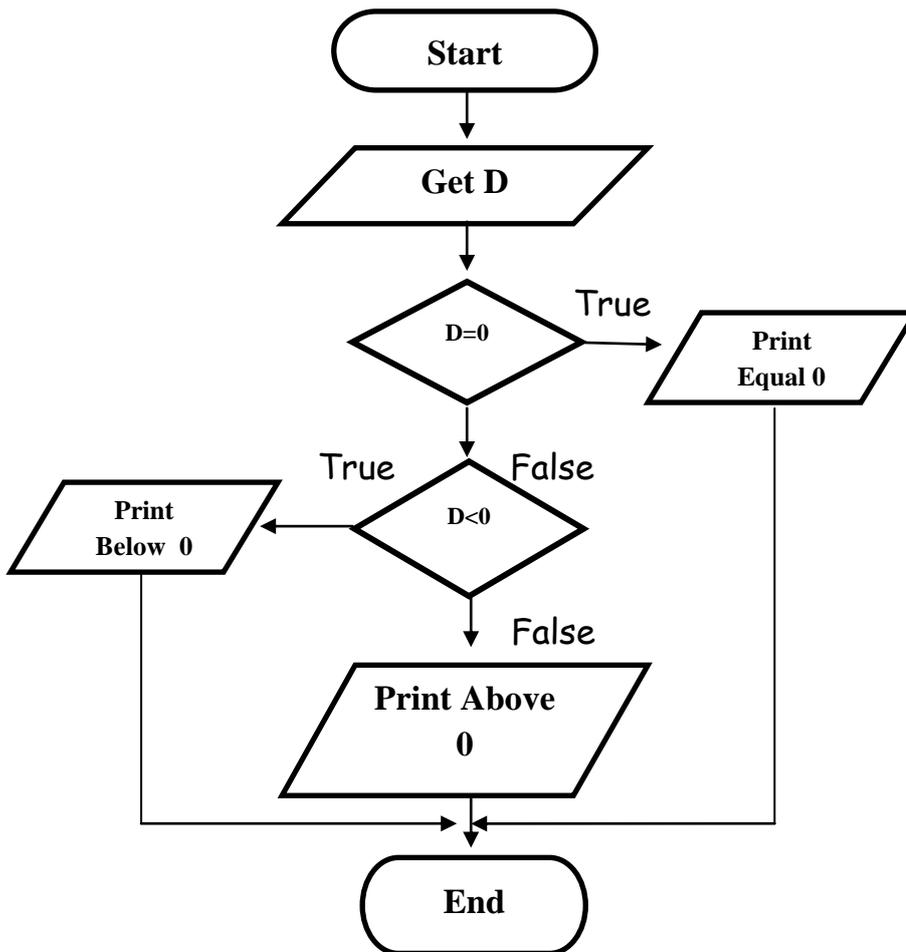
Draw A flowchart for a program that get a temperature degree from the user , and print out the following result "greater than zero" - "Less than zero"- "Equal zero".

Answer :-

Output : Greater than zero . Less than zero . Equal zero".

Input : Temperature degree D

Solution : Compared to the zero temperature





EX (5):-

Draw A flowchart for a program that entering 2 different numbers and print "the biggest number is.....?" and "The lowers number is"

Answer :-

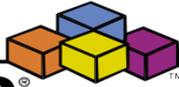
Output : print "the biggest number is.....?" and "The lowers number is"

Input : X , Y where X is not equal Y

Solution :

Algorithm	Flowchart





EX (6):-

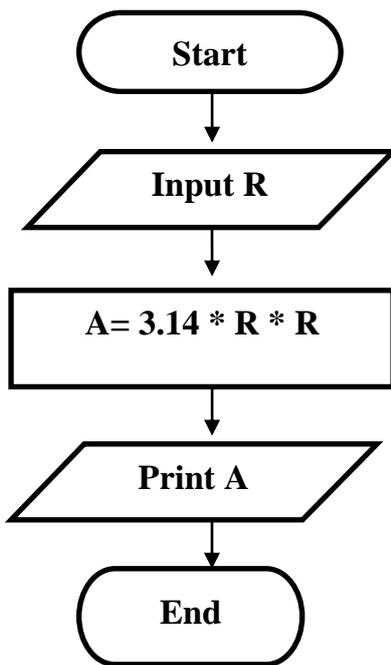
Write down the Algorithm, and draw a flowchart to calculate the Area of a Circle whose radius "R" is known, so that the message is not allowed appears, and then get out of the program when entering " R "a Negative value.

Answer :-

Output :

Input :

Solution :



Flowchart	Modified Flowchart
<pre> graph TD Start([Start]) --> Input[/Input R/] Input --> Process[A= 3.14 * R * R] Process --> Output[/Print A/] Output --> End([End]) </pre>	





The use Loop in flowchart

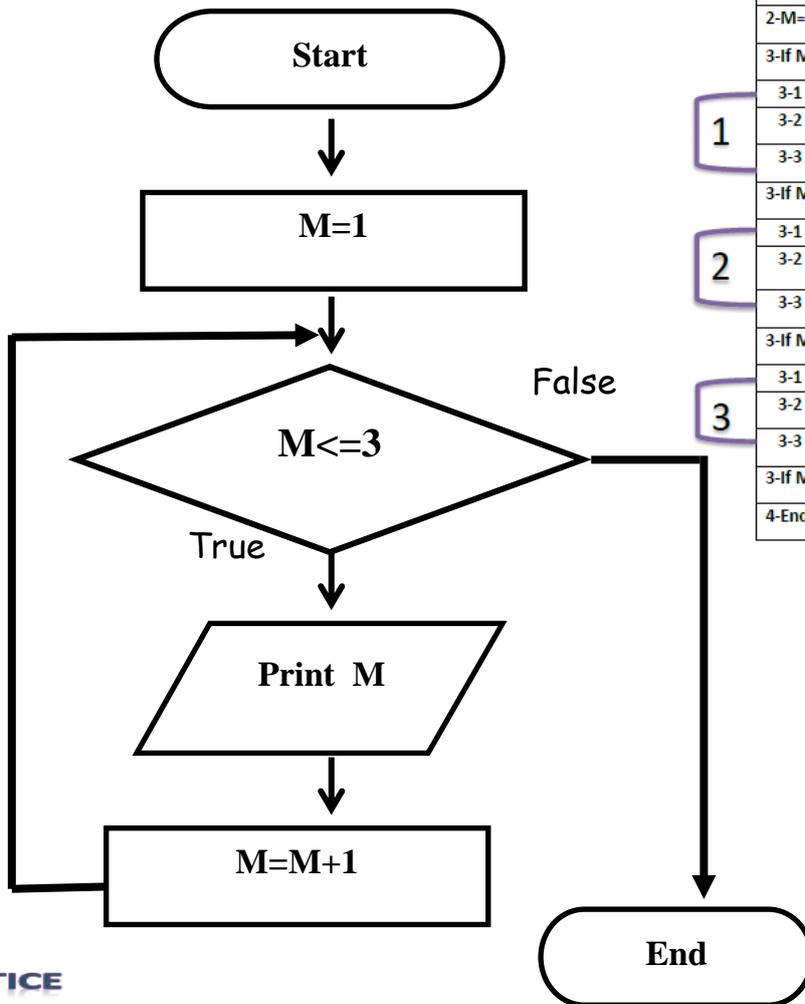
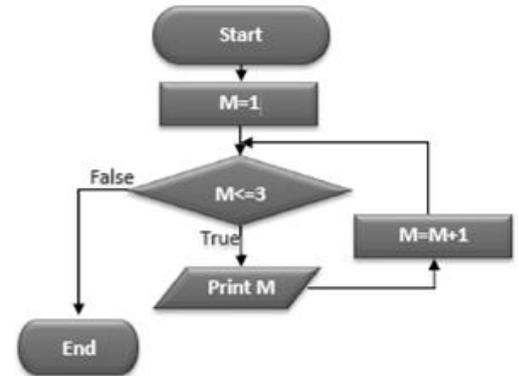
EX (1):-

Print out the numbers from 1 to 3

Output: Print numbers from 1 to 3

Input : " M " (Counter)

Solution : Print "M " the number increased by one , then print "M" to become greater than 3.



Step	Result	value of M
1-Start	There is No variable	
2-M=1	1	
3-If M<=3 (True)	1	
3-1 Print M	1	1
3-2 M=M+1	2	
3-3 Go to step (3)	2	
3-If M<=3 (True)	2	
3-1 Print M	2	2
3-2 M=M+1	3	
3-3 Go to step (3)	3	
3-If M<=3 (True)	3	
3-1 Print M	3	3
3-2 M=M+1	4	
3-3 Go to step (3)	4	
3-If M<=3 (False)	4	
4-End	4	

NOTICE

- 1-As long as the value of M does not exceed 3, the program prints value of M. When M becomes 4 ;(M=4) the program goes to step (4).
- 2- The following figure is the same flowchart drawn above but in a different way, so it does not matter the figure drawn, what really matters is the sequence of steps.



How many times was the content of the loop executed?
 What will be the value of M at the end of the loop?

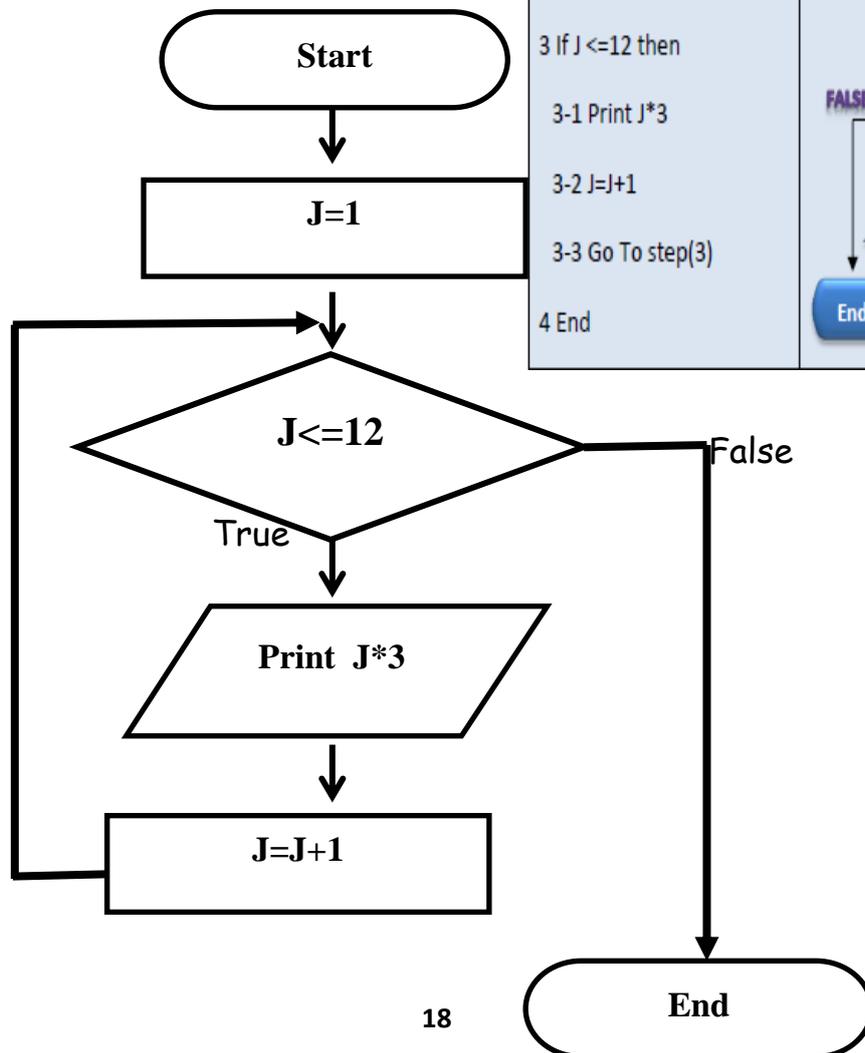
EX (2):-

Modify the flowchart of the previous exercise to print the multiplication table of No3.

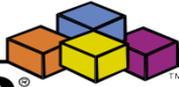
Output: Print numbers from 1 to 3

Input : " J " (Counter)

Solution : Print "J " the number increased by 3 , then print "M" to become greater than or equal 12.



Second :Algorithm	Third :Flowchart
1 Start	
2 J=1	
3 If J <=12 then 3-1 Print J*3 3-2 J=J+1 3-3 Go To step(3)	
4 End	



EX (3):-

Modify the flowchart of the previous exercise to print the multiplication for any table.

Output: Print

Input : " J " (Counter)

Solution : Print

Algorithm	Flowchart
	<pre> graph TD Start([Start]) --> Input[/Input N/] Input --> J1[J=1] J1 --> Decision{J<=12} Decision -- Yes --> Print[/Print N*J/] Print --> Jinc[J=J+1] Jinc --> Decision Decision -- No --> End([End]) </pre>

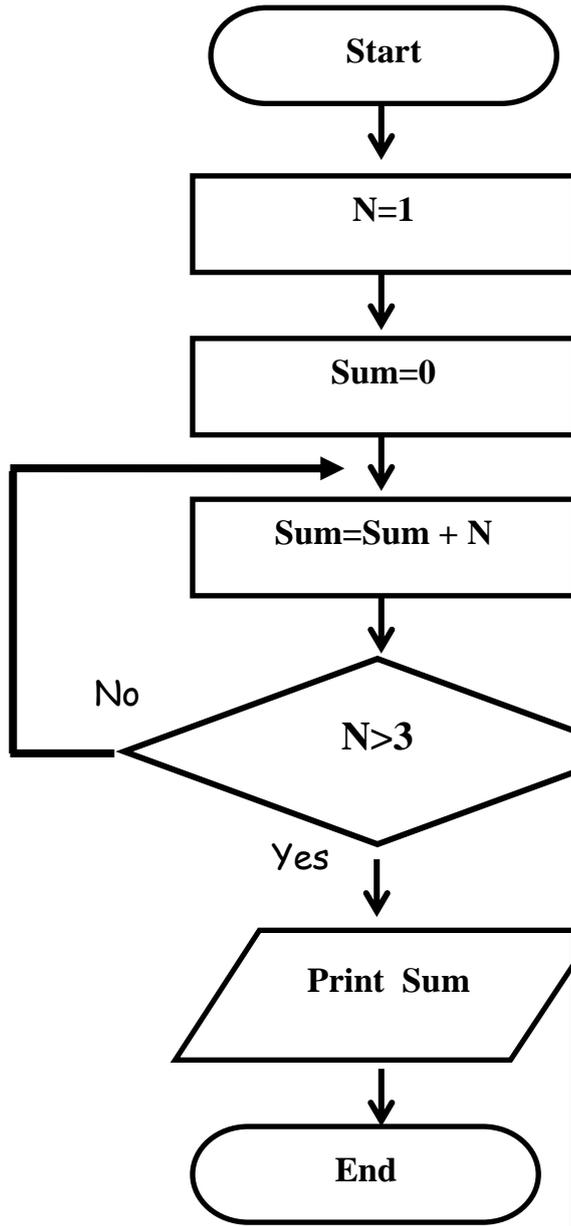
Repeat





EX (3):-

Print out the sum of integer numbers from 1 to 3



Step	Value of N	Value of M	Result
1-Start	No variable	No variable	
2-N=1	1	No variable	
3-Sum=0	1	0	
4-Sum=Sum+N	1	1	
5-N=N+1	2	1	
6-if N>3 (False)	2	1	
7-1 Go To step (4)	2	1	
4-Sum=Sum+N	2	3	
5-N=N+1	3	3	
6-if N>3 (False)	3	3	
7-1 Go To step (4)	3	3	
4-Sum=Sum+N	3	6	
5-N=N+1	4	6	
6-if N>3 (True)	4	6	
6-1 Print Sum	4	6	6

Algorithm	Flowchart
1 Start	
2 N=1	
3 Sum=0	
4 Sum =Sum + N	
5 N=N+1	
6 If N>3 Then 6-1 Print Sum	
7 Else 7-1 Go to step (4)	
8 End	



EX (4):-

Print out the Figure shows a flow chart that will print even integer numbers from 1 and 10.

$N=N+2$

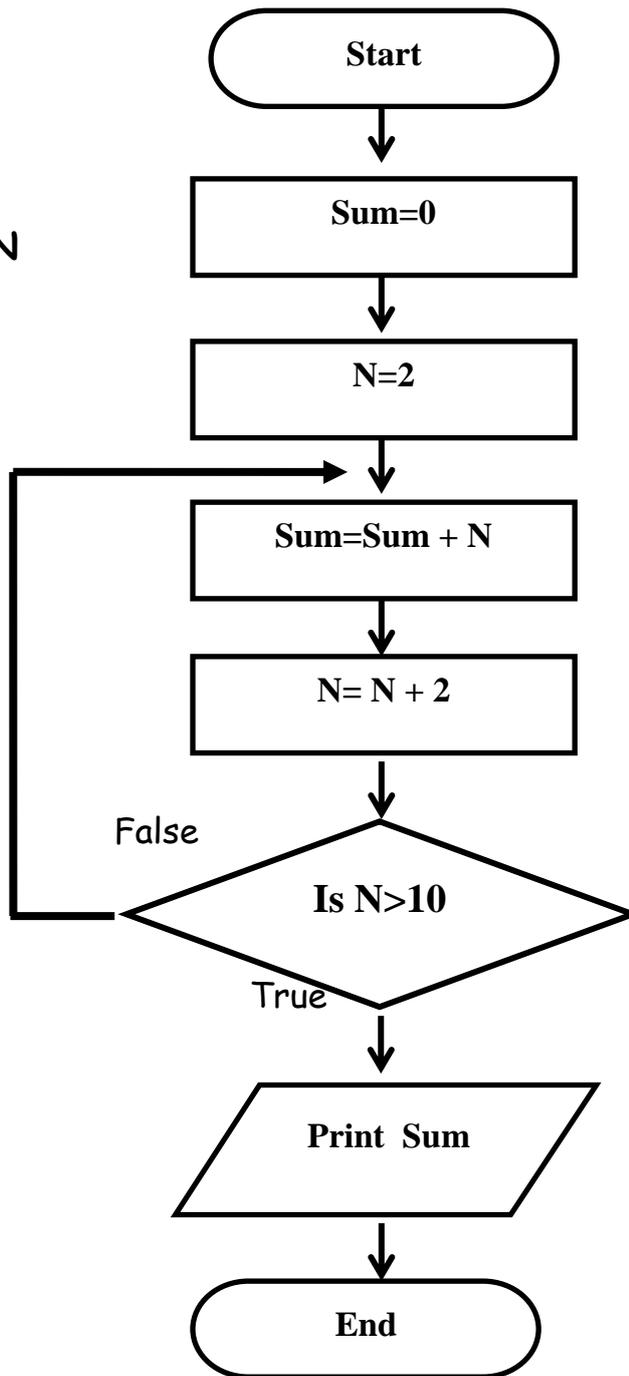
$N>10$

$Sum=0$

$Sum=Sum + N$

Print Sum

$N=2$





EX (5):-

Print out the Figure shows a flow chart that will print Odd integer numbers from 1 and 10.

$N=N+1$

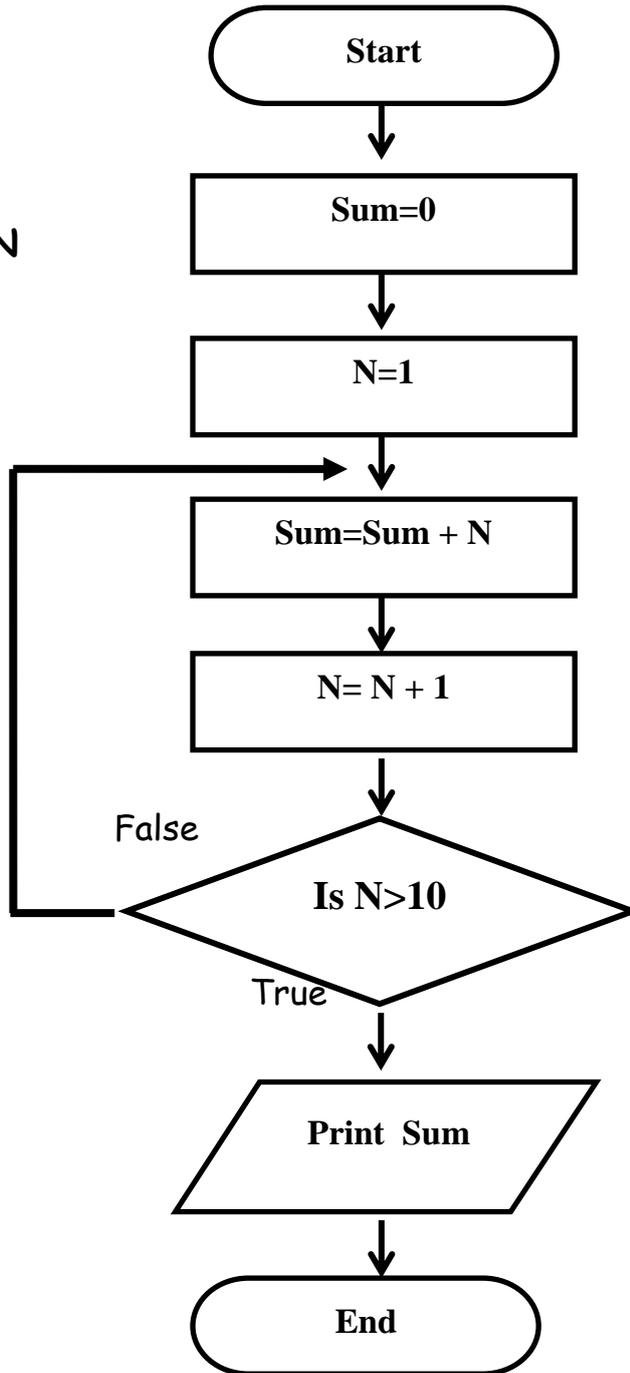
$N>10$

$Sum=0$

$Sum=Sum + N$

Print Sum

$N=1$





Chapter Two

Introduction to Visual Basic

1. Visual Basic .NET

Visual Basic .NET is just one of the languages in Visual Studio .NET

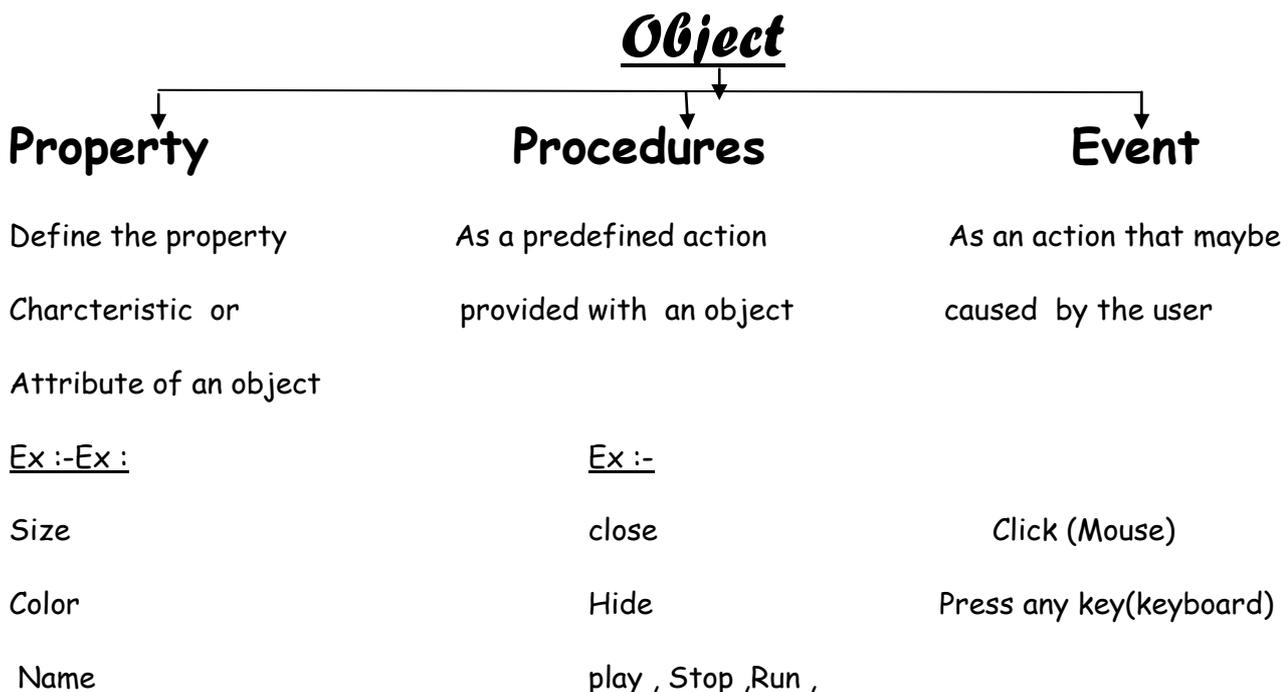
Visual Basic .NET is an object-oriented language that develops event driven

1. Windows Application
2. Web applications.

2. Programming Language :-

Is a set of rules write in Visual Basic .Net through it create **Objects** in computer memory each one has:-

1. **Properties** like (Size , color , font style...)
2. **Event** like (click) on command button
3. **Procedures** include instruction and orders ,implemented when calling the procedure.





3- Visual Basic .Net (NET Framework):

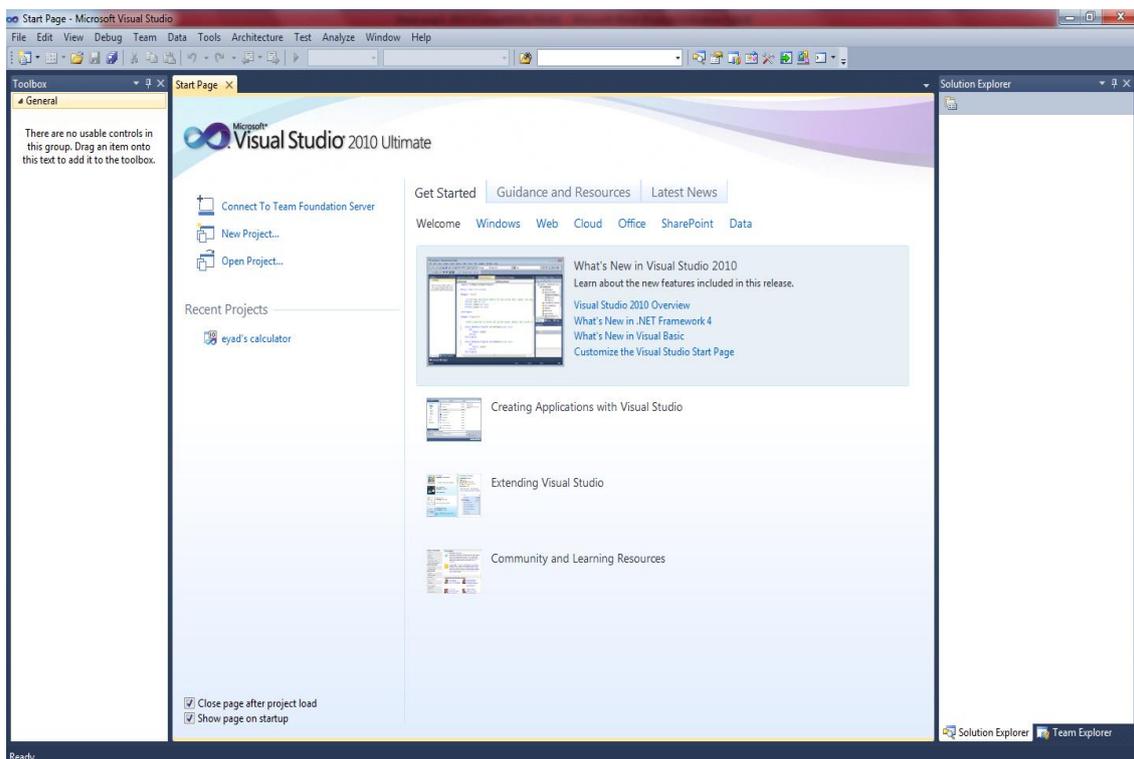
*It mean the Libraries from which objects are created .

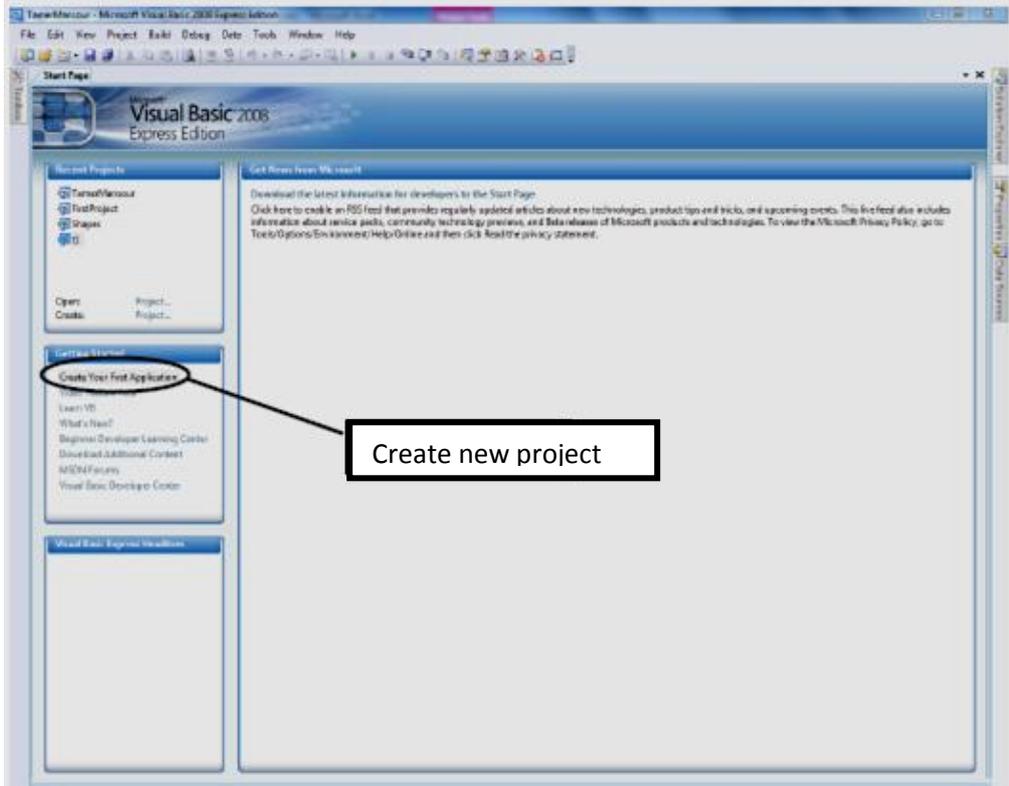
*Provide development environment → It called "Runtime" in computer memory.

*Compiler:- mean translate orders and instructions written in machine language programming that deals with computer.

4- Visual Basic .Net (IDE):

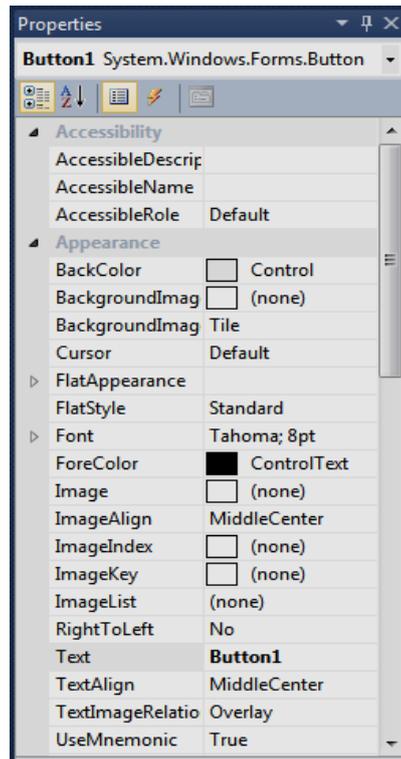
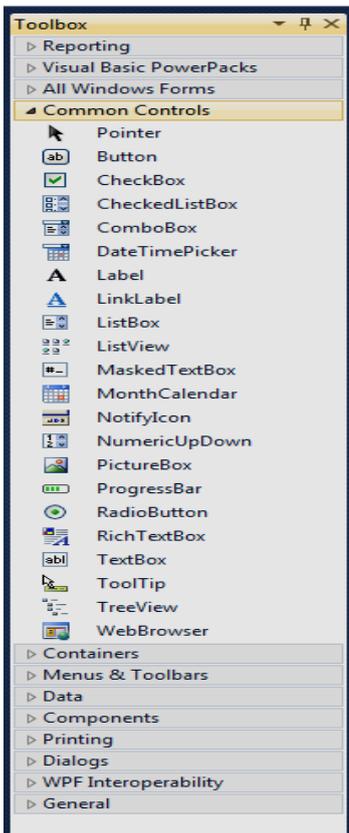
IDE (Integrated Development Environment) provides tools and features for programmer to create applications (Windows, Mobile, Web...) called "Visual Studio"

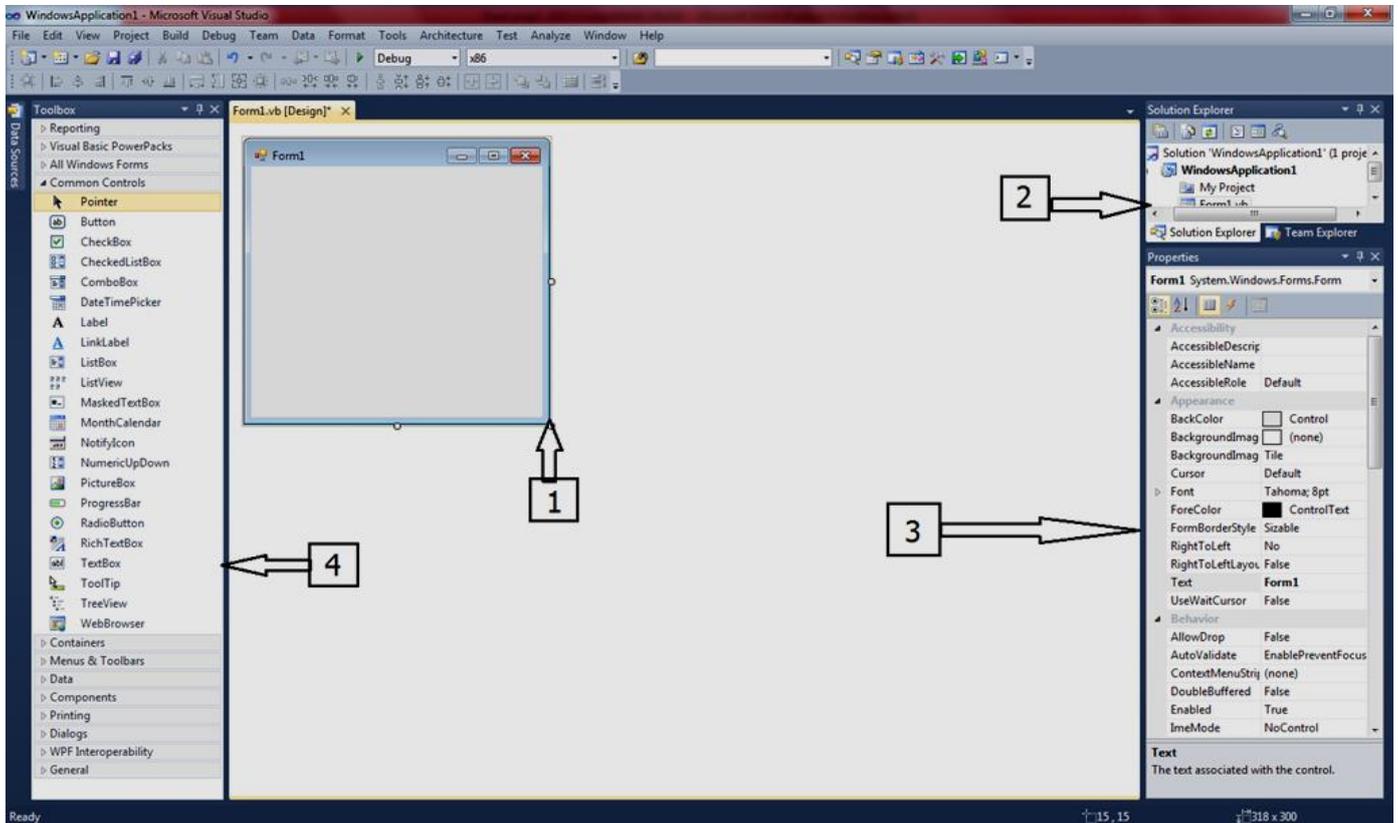




Toolbox

Properties windows





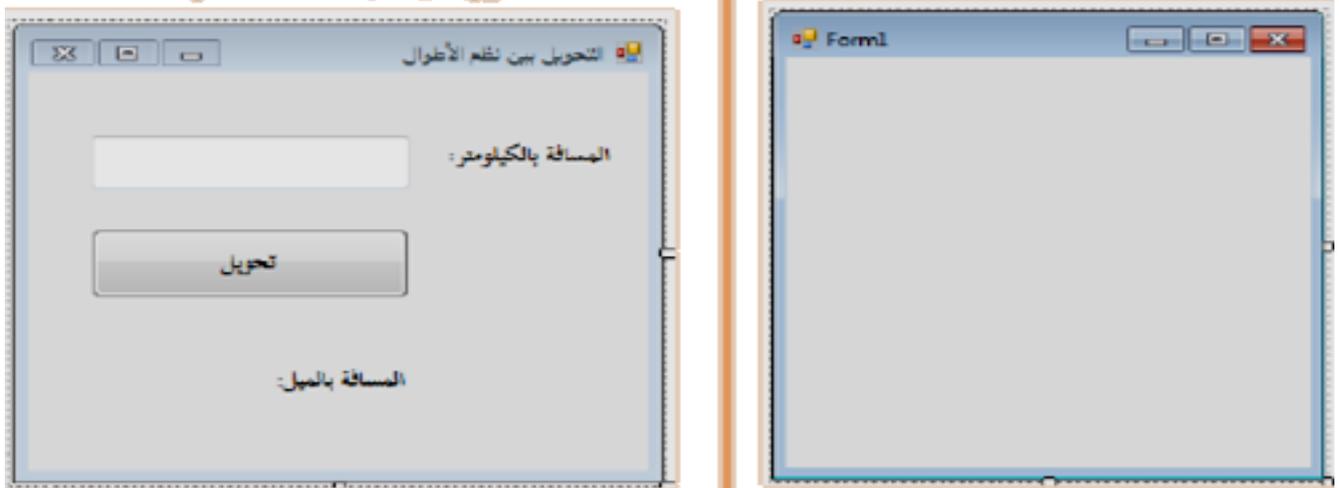
The form windows

- 1- Form window
- 2- Solution Explorer window
- 3- Properties window
- 4- Toolbox window



1.Forms :-

The form is the window (visible interface) of the application; what users will see and work with when they run this application .A form is the container upon which controls (CommandButton – Textbox- Label..etc) are placed



2.Toolbox :-

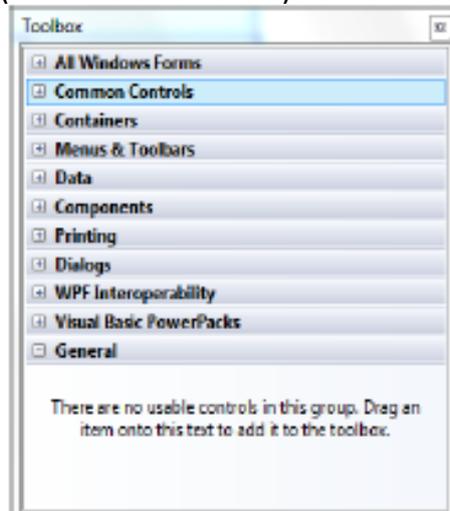
The Toolbox contains controls (objects) that the programmer can place on the form, these controls are available in tabs (categories)

notice that a (+) sign is displayed with each tab, when we click on it ,the tab expands and a set of controls will be displayed.

You can display all the (Controls), by choosing (All Windows Forms) Tab or category.

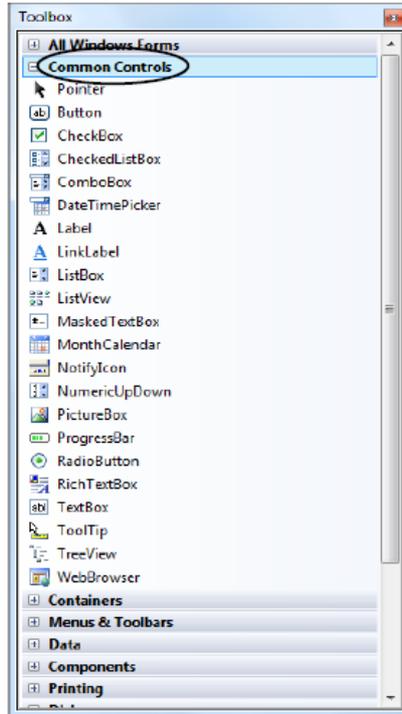
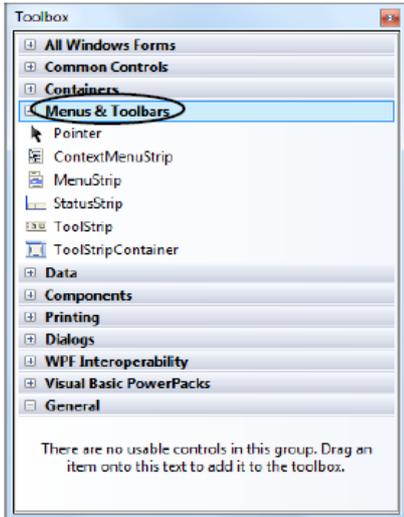
From these categories we also have

- (Common Controls)
- (Menus & Toolbars)





Each category falls under the total control tools:-



Some of the (Common Controls)

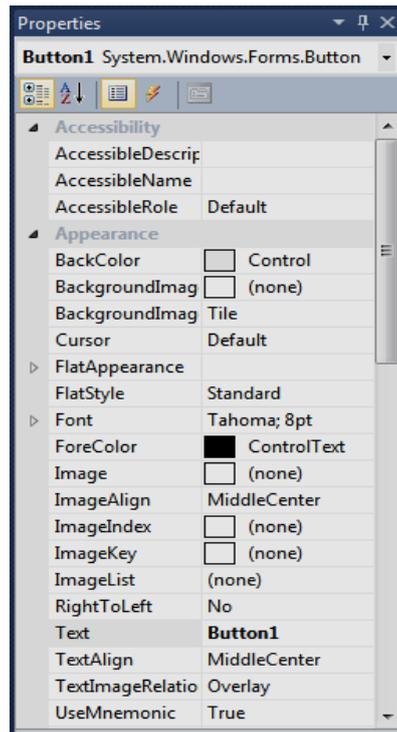
Control	Control
ComboBox	Button
CheckBox	TextBox
RadioButton	Label
	ListBox





3.Properties Window :-

Each control from the above has properties . A Properties window lists the property settings for the selected Form or control and permits changes to each setting to be made.



Left column
Name of property

Right column
Value of property

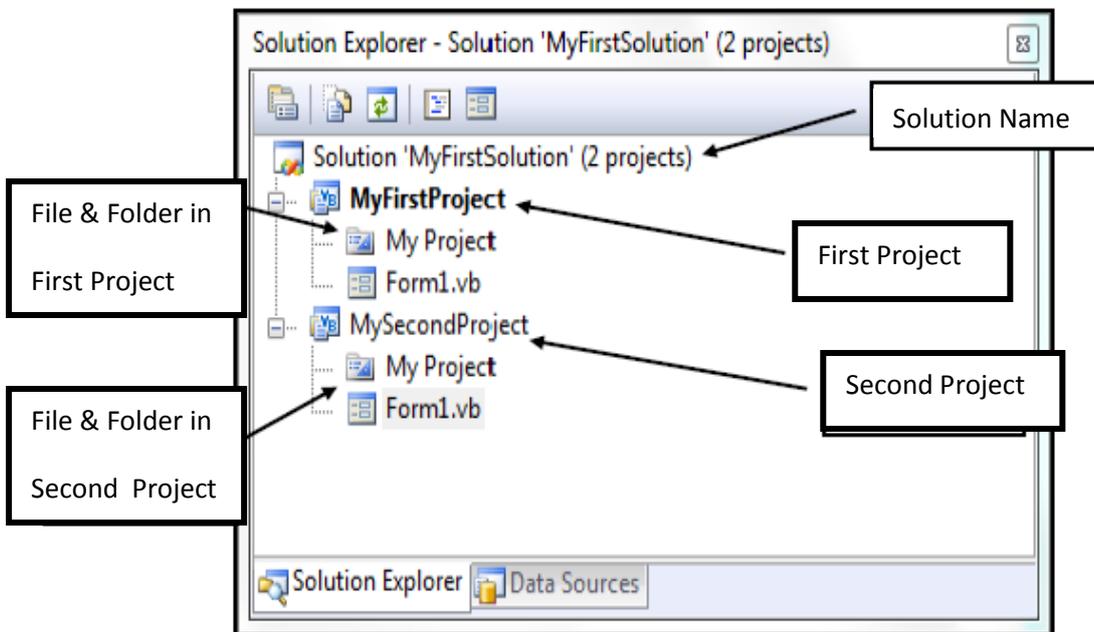
NOTICE

In (IDE) screen, displayed properties differ upon the selected element.



4.Solution Explorer :-

The Solution explorer window contains a list of items of the current solution ;and may contain one or multiple projects .It also displays a hierarchical list of all the components, (files and folders) organized by project,





Practical Work

- 1.Create a project his Name is "My First Project"
- 2.Solution Name "My First Solution"
- 3.Add anew project to this solution his name "My Second Project"

Create a New Project

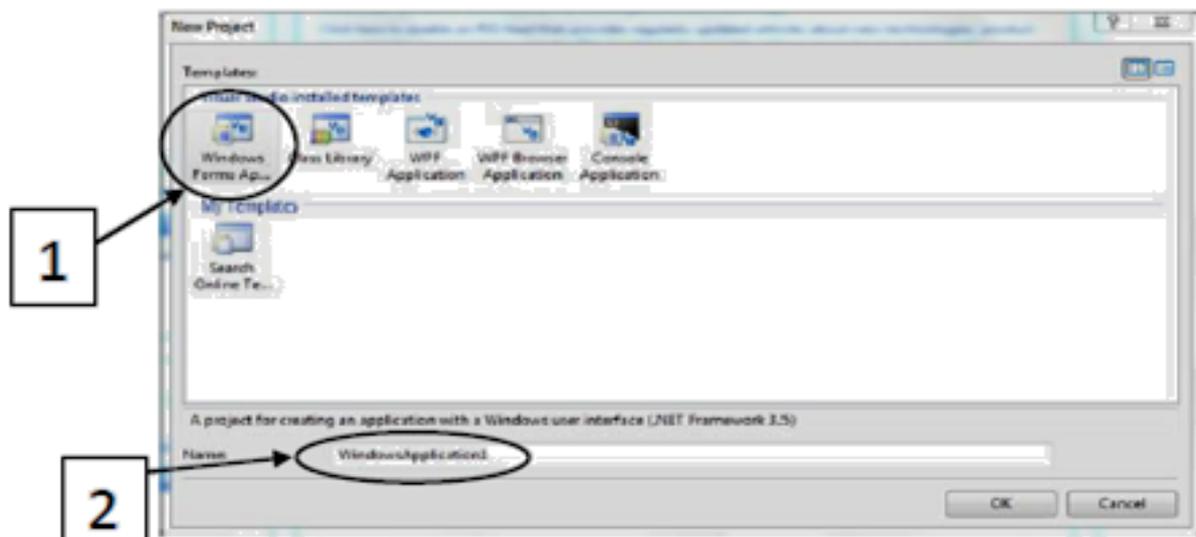
With your teacher's assistance open the (Visual Studio),available on your computer.

Type the name of the (Visual Studio) opened on the screen.

.....

From (File) menu choose (New Project) .

A new window is displayed **as shown in figure (2-8)**.





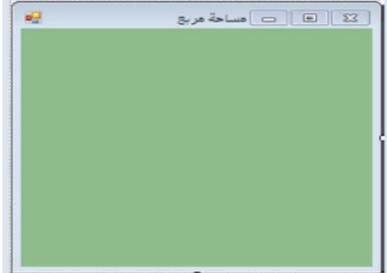
Chapter three

(1)Form :-

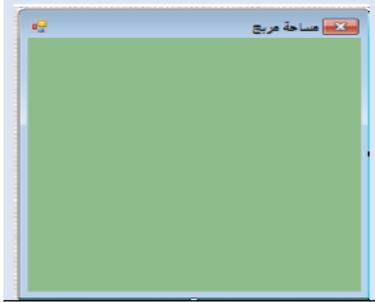
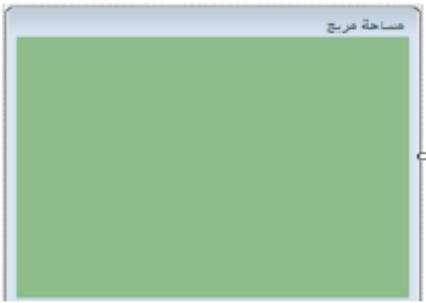
No.	Property	Function
1	Name	Name of the Form used in the code.
2	Text	Text appearing on the title bar of the Form.
3	FormBorderStyle	The Border outline of the Form's window.
4	BackColor	The background color of the Form's window.
5	WindowState	Determine the size of the window on the screen, whether maximized or minimized or normal
6	ControlBox	Enable or disable (hide) the Control box appearance in the window.
7	MinimizeBox	Enable or disable (hide) the appearance of the Minimize Button in the window.
8	MaximizeBox	Enable or disable (hide) the appearance of the Maximize Button in the window.
9	ShowInTaskbar	Enable or disable (hide) the appearance of the Form icon on the (TaskBar).
10	StartPosition	Locate the Form's window on the screen.
11	RightToLeftLayout	Determine whether the Layout direction of (Controls) on the (Form) is from right to left.
12	RightToLeft	Determine whether the writing direction of (Controls) on the (Form) is from right to left ;such as the text direction in the (TextBox) .



Set the following properties for a form on your computer :-

Property	Value	The impact of the property	Form after precision
Name	frmSquare	In design mode	Name don't show in form used in the code
Text	AreaSquar	In design and running mode	
Color	DarkSeaGreen	In design and running mode	
RightToLeft	Yes	In design and running mode	



RightToLeftLayout	True	In design and running mode	
MaximizeBox MinimizeBox	False False	In design and running mode	
ControlBox	False	In design and running mode	
FormBorderStyle	None	In design and running mode	
WindowState	Maximized	In running mode	Full Screen



Notes:-

1. Some properties (such as: Text – Name – Forecolor – BackColor – RightToLeft.....etc.) are common to most controls.
2. Some properties will not be applied to controls placed on a form; unless we set other properties to these controls like :(RightToLeft) and (RightToLeftLayout).
3. Controls placed on a form will have, by default, some of the properties as the form. We can say that controls inherit some of the form's properties e.g. (Font) and (ForeColor).

NOTICE

1. The value of (Text) property is displayed as text in the title bar of the Form (frmSquare).
2. The default values of the properties (Text) and (Name) are (Form1); which means they are the same.
3. The name of the (Form) is (frmSquare), earlier it was (Form1).

NOTICE

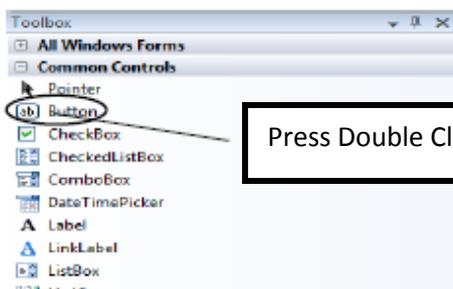
The property (RightToLeftLayout) will not be active, unless the property value of (RightToLeft) is (Yes).



(2)Button :-

A Button is one of the (Controls) that can be drawn on the (Form)

A user will use a button by clicking on it to perform a specific task.



Press Double Click



No.	Property	Function
1	Text	The text on the (Button).
2	ForeColor	The foreground color for the text on the (Button) or its (Font color).
3	BackColor	The background color for the (Button);(background color).
4	Font	The text's (Font, Size and Style) on the (Button).
5	Location	The location of the (Button) on the Form's window.
6	Size	The height and width of the (Button) on the Form's window.

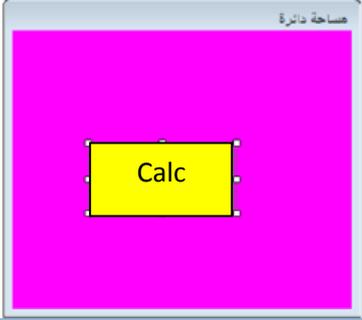
NOTICE

- Eight boxes (sizing handles) are shown at the Borders and corners of the (Button).
- This means; the possibility of changing the size of the (Button) on the (Form). Place the mouse pointer on one of the eight boxes. Hold down the left mouse button and Drag the mouse in the direction of either arrowhead. Release (Drop) the mouse button when the desired size is reached.
- To Move the (Button): place the mouse pointer inside the (Button) and hold down the left mouse button. Drag the (Button) to the desired. position and then Drop the mouse button.



Property	Value	The impact of the property	Form after precision
Location	0;0	In design and running mode	
Location	98;108	In design and running mode	
Size	75;23	In design and running mode	
Size	121;62	In design and running mode	



BackColor	Yellow	In design and running mode	
ForeColor	Blue		
Text	Calc		



(3)label :-

A Label is a control used to provide the user with information. It appears as a heading or title within a form; to let the user know the form's content. Label controls cannot be changed; users cannot type in (any text) during the run-time.

Can't be changed, users can't type in during the run time.

AutoSize Property: True \longrightarrow automatically adjust

False \longrightarrow manually adjust the size of label

Property	Function
AutoSize	Specifies whether the size of the control (Label) is automatically adjusted by text written
BorderStyle	Specifies the border style of the control (Label)

Property	Value	The impact of the property	Form after precision
Name	lblResult	In design mode	
Text	Result	In design and running mode	
ForeColor	Choose the color		
BackColor	Choose the color		
Font	Choose the color, Font , Style, Size		
Autosize	False		
BorderStyle	FixedSingle		



(4) TextBox :-

A TextBox control can be used for both entering data and displaying results.

Property	Function
MaxLength	Specifies the maximum number of characters that user can write in the (TextBox) .
PasswordChar	Specifies the symbol that will be displayed instead of the text written; as example: creating a Password.
MultiLine	Determines whether the (TextBox) control allows multiple lines.

Property	Value	The impact of the property	Form after precision
MaxLenght	30	In Running mode	
PasswordChar	*		
MultiLine	True		



(5)ListBox :-

A Listbox control is used for displaying a list of items.

Property	Function
Items	Presents a set of items displayed in the (ListBox)
Sorted	Specify whether the items are arranged or not
SelectionMode	Determine whether it is possible to select one or more item displayed in the (ListBox).

Property	Value	The impact of the property	Form after precision
Items	عمرو رامي ياسمين سمر	<p>Names have been arranged alphabetically</p> <p>You can select more than one item</p> <p>In running mode</p>	
SelectionMode	MultiExtended		
Sorted	True		



(6)ComboBox :-

A ComboBox control displays a drop-down list from which one item can be selected.

No.	Property	Function
1	Items	Presents the items in the (ComboBox)
2	AutoCompleteSource	The maintained source of items used for automatic completion of input string.
3	AutoCompleteMode	The input string or (prefix being entered) that will be compared to the prefixes of all strings in a maintained source; upon which the automatic completion will be done.

Property	Value	The impact of the property	Form after precision
Items	مصر السودان جيبوتي اريتريا الصومال ليبيا تونس الجزائر المغرب موريتانيا "اسم كل بلد في سطر" "Each country in new line "	In running mode	
AutoCompleteMode	Suggest		
AutoCompleteSource	ListItems		



(7)GroupBox :-

A (GroupBox) control is used to group other controls of same function together on the Form window.

Property	Value	The impact of the property	Form after precision
Text	النوع	In design and running mode	
ForeColor	Choose any color		
RightToLeft	Yes		



(8)RadioButton :-

A (RadioButton) is used to select one option from a group of mutually exclusive options.

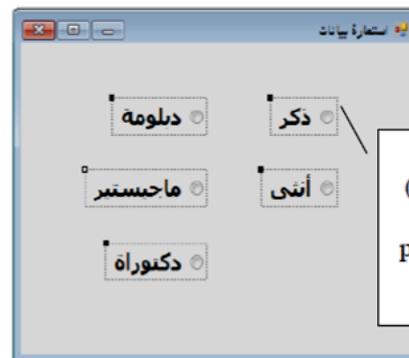
No.	Property	Function
1	Checked	Indicates if the (RadioButton) has been selected or not
2	Text	The text displayed on the (RadioButton)

NOTICE

The effect of many (Properties) is not shown during design mode, but in run-time mode **as shown in figure (3-41)**.



Note that the (RadioButton1) is the one active



A set of (RadioButton) where the property (Text) have been adinsted as

The previous figure asks the user to choose the Gender, and the Scientific Degree as well; but one (RadioButton) control doesn't allow this. To solve the problem, we set two (GroupBox) controls; the first one contains the Gender while the second one contains the Scientific Degree by dragging (RadioButtons), each one in its group; **as shown in figure (3-42)**.



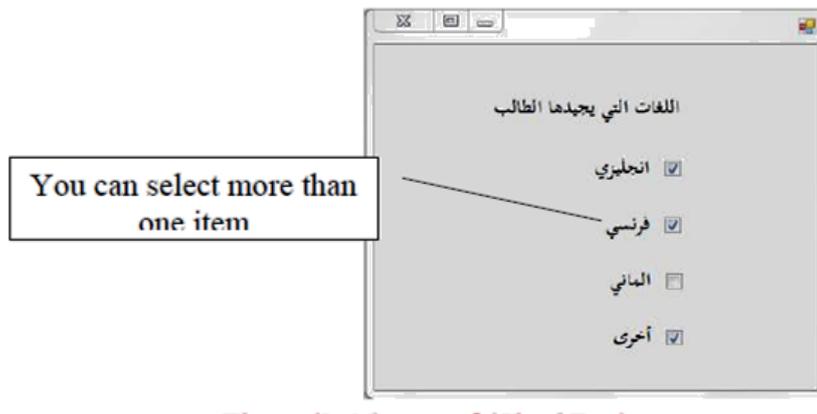
NOTICE

- The control (RadioButton) has a set of properties like (Name – Visible – Size– Location –RightToLeft – ForeColor– Font) you can deal with as you have learned earlier in this chapter



(9)CheckBox :-

A (CheckBox) control is used to select one or more options.



NOTICE

- The control (CheckBox) has a set of properties like (Name – Visible – Size– Text –Checked – Font –ForeColor– RightToLeft –Location) you can deal with as you have learned earlier in this chapter



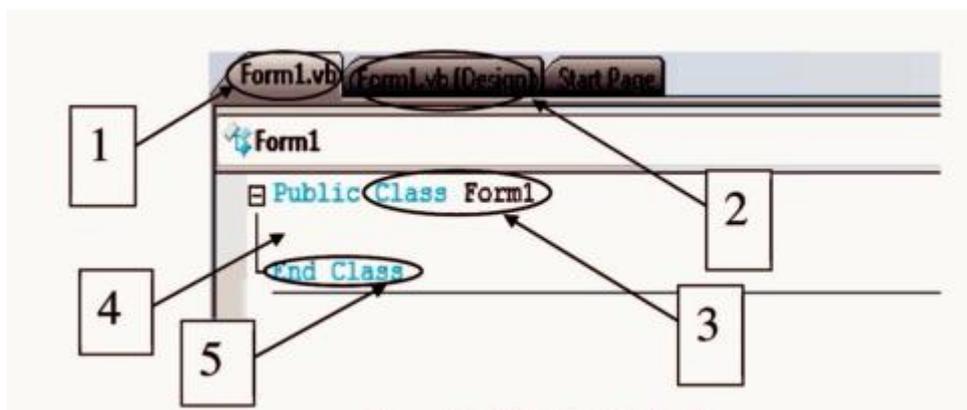
Chapter four

Code Window

Through the Code window; we can write instructions and codes using (Visual Basic .Net) language “Language under study”.

To open the (Code Window) of (Form1) perform the following:

1. Make sure that the window Form is active
2. From the keyboard press (F7)



- (1) Name of the file where codes are saved.
- (2) Name of the file where the Form window is saved.
- (3) The declaration of Class; its name is (Form1).
- (4) Space between two lines; to type codes for the Class (Form1).
- (5) The end of the Class.



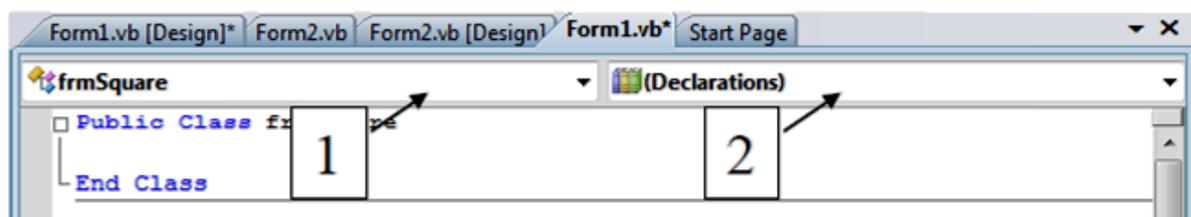
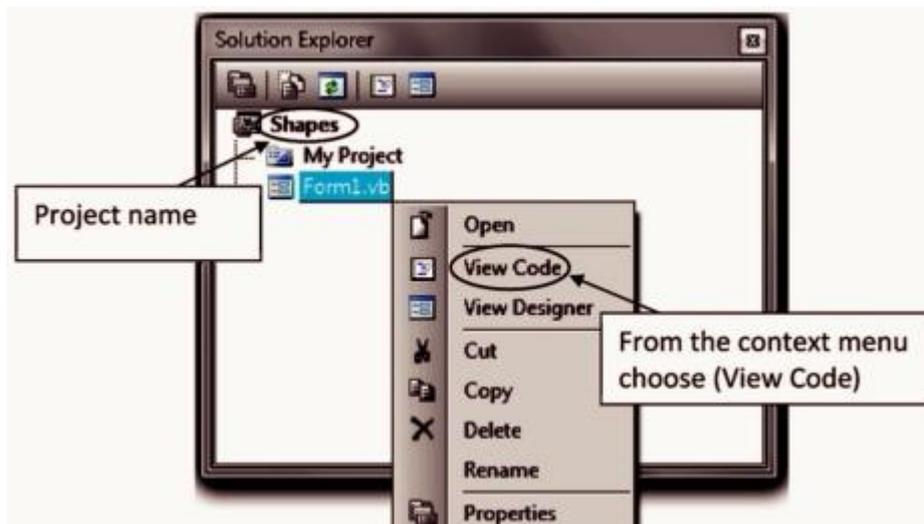
Event Handler:-

1. With the help of your teacher, create a (Project) named (Shapes) and save it with a solution name (Geometric), then set up a (Form) of name (frmSquare); with the controls displayed



(1) The Solution name.

(2) (Visual Studio) version used.

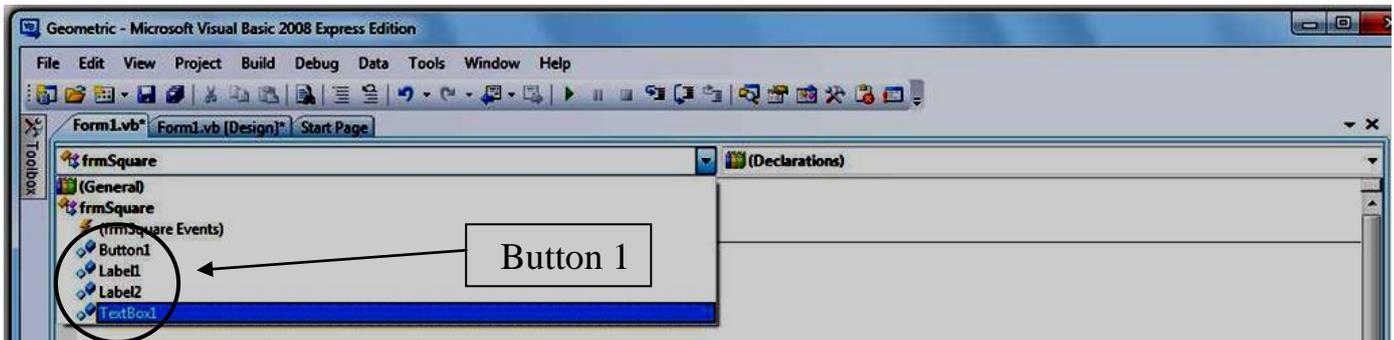


(1) A drop-down menu of (Class Names), which refers to the names of controls placed on the Form.

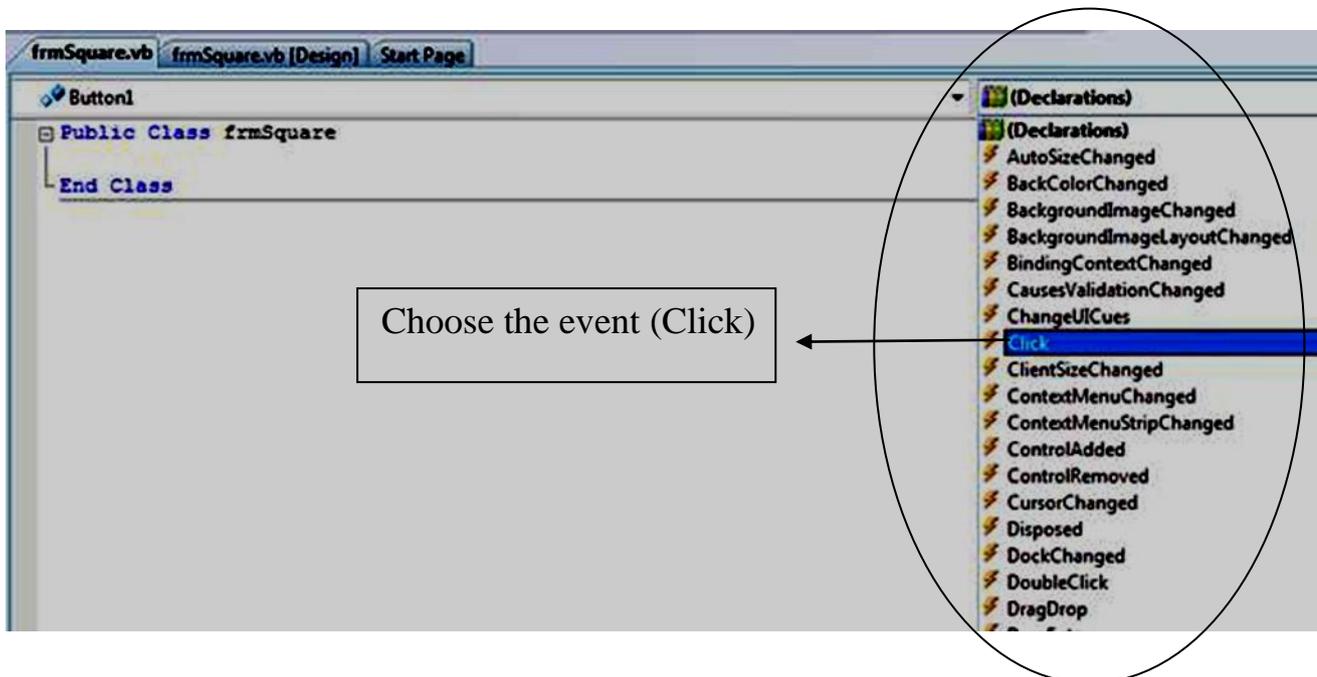
(2) A drop-down menu of (Method Names) or events; associated with the Class selected from the (Class Names) menu.



2. Open the drop-down (Class) menu and note that the default names of the controls are listed

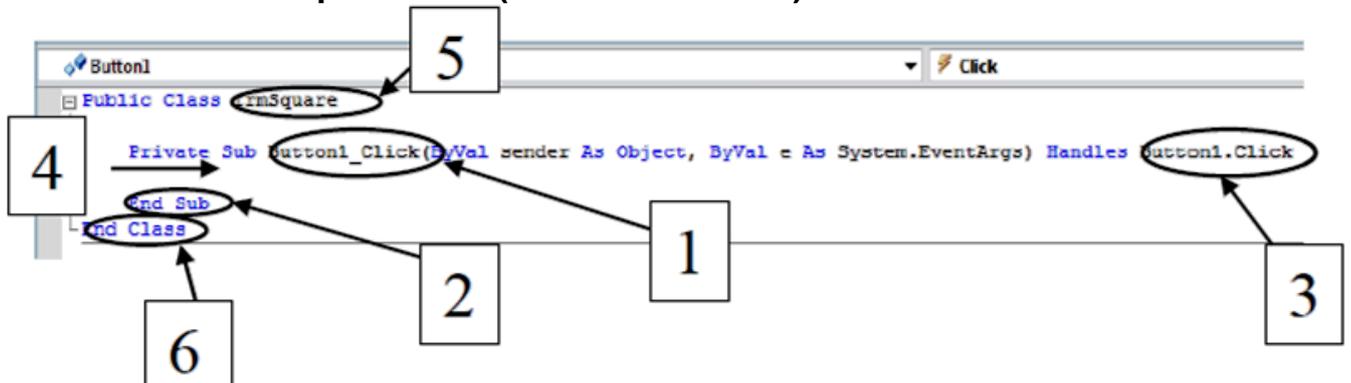


3. When you select (Button1) from the Class menu, open the drop-down (Methods) menu; it displays the events associated with (Button1)





Event handler is the procedure (called into action) when an event Occurs



- (1) The procedure **name composed** of (object name, event name)
- (2) **End** of procedure
- (3) What causes the call of the procedure (**event occurrence**).
- (4) Between the two lines shown; you can **write statements or codes** that will be executed after invoking the procedure.
- (5) The declaration of the **Class (frmSquare)**
- (6) The **end of the Class**

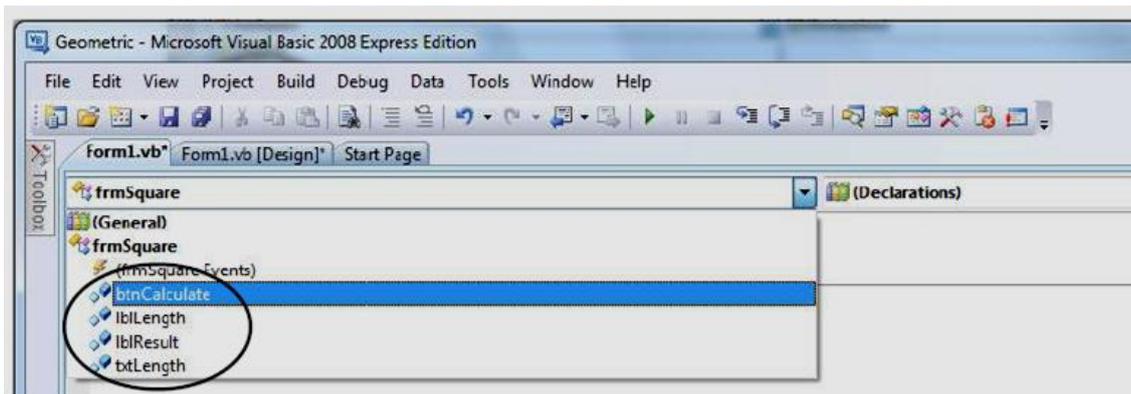
*Adjust the property (Name) for the following controls

Value of the property (Name)	Control
btnCalculate	Button1
lblLength	Label1
lblResult	Label2
txtLength	TextBox1



*After setting the properties, choose the (View) menu then select (Code).

Open the drop-down (Class) menu and note that the displayed names of the controls have been changed



Setting the (Properties) programmatically:-

Setting the (Properties) programmatically

CONTROLNAME . PROPERTY = VALUE

The control or the object name

The property

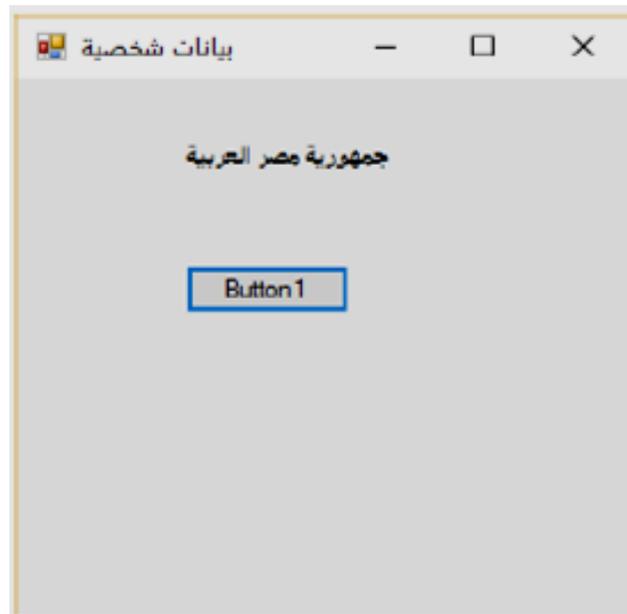
The value



ControlName.Property =Value

Ex:-

```
Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click  
    Label1.Text = " جمهورية مصر العربية "  
End Sub
```



Wish You a Good luck

