Chapter Three
Controls

By the end of this chapter, student will be able to:

- ◆ **Recognize the (Properties Window)**

- ◆ **Adjust the properties assigned to Controls**

- ◆ **Choose the appropriate Property**

- ◆ **Choose the proper value for the Property**

- ◆ **Differentiate between controls' Properties**

Before starting the review of the properties of some controls, the following points should be noted.

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).

3–1 Form

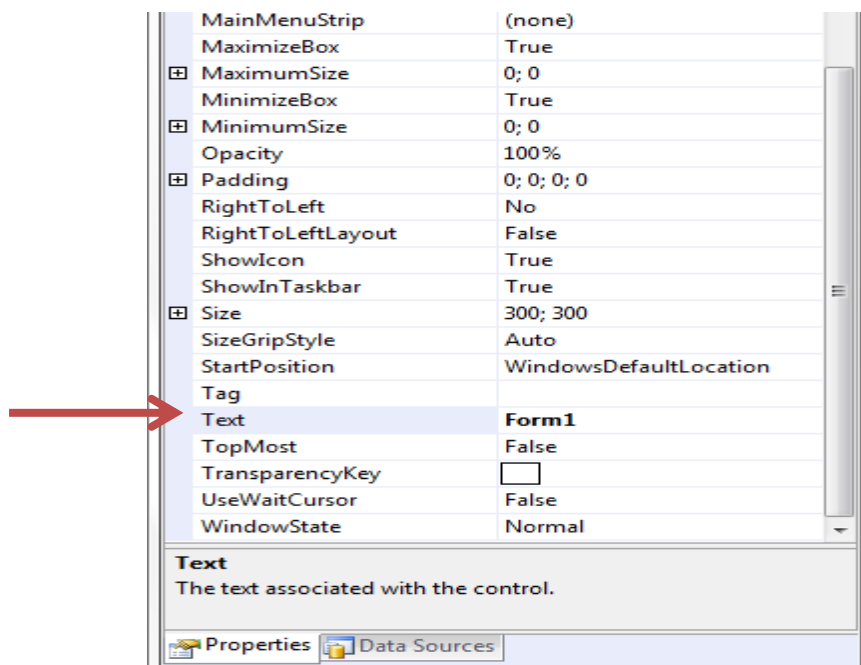There are many properties assigned to the form **as shown in figure (3-1)**.

MainMenuStrip	(none)
MaximizeBox	True
⊞ MaximumSize	0; 0
MinimizeBox	True
⊞ MinimumSize	0; 0
Opacity	100%
⊞ Padding	0; 0; 0; 0
RightToLeft	No
RightToLeftLayout	False
ShowIcon	True
ShowInTaskbar	True
⊞ Size	300; 300
SizeGripStyle	Auto
StartPosition	WindowsDefaultLocation
Tag	
Text	**Form1**
TopMost	False
TransparencyKey	
UseWaitCursor	False
WindowState	Normal

Text
The text associated with the control.

🔲 Properties 🔲 Data Sources

Figure (3-1) (Properties window) of the Form

NOTICE

> 1. The column to the left is the properties list, such as Property (Text).
> 2. The column to the right is the setting list, which provides the current value assigned to the property; such as (Form1).
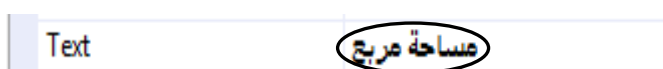
(Name)

(Text)

3–1–1 Setting properties

1. Create a new project and name it (SquareArea).
2. Select the Form window (Form1) and activate its Properties window, then:

- Change the value of the (Name) Property to (frmSquare) **as shown in figure (3-2).**
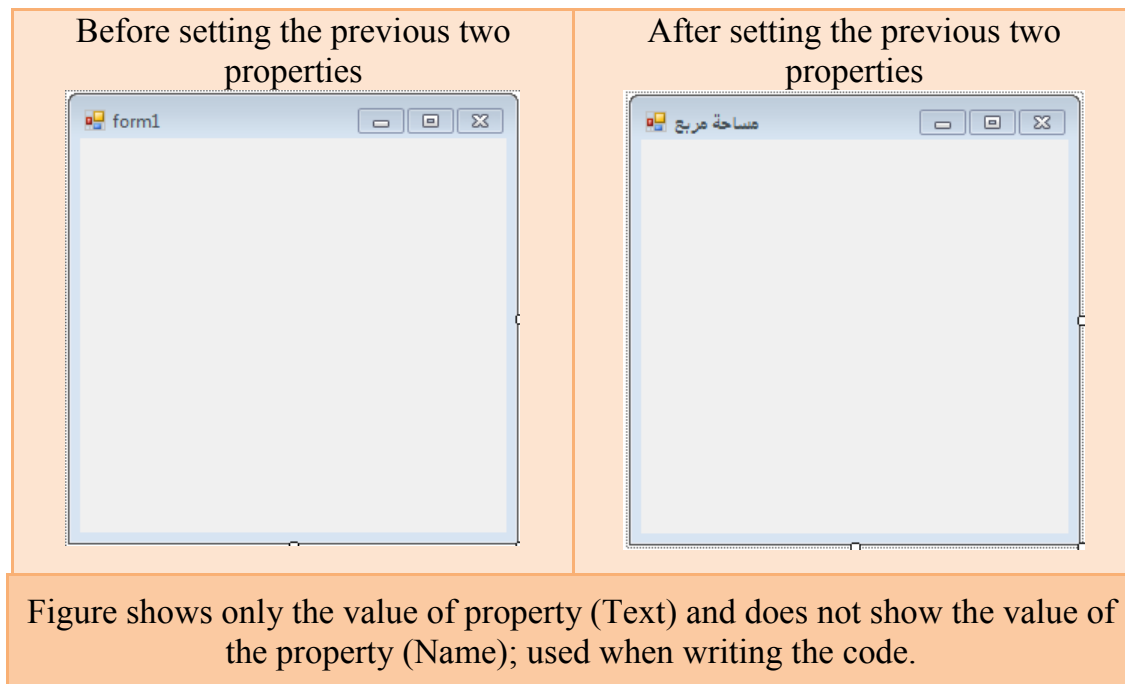
–

Property | (Name) | frmSquare | Value
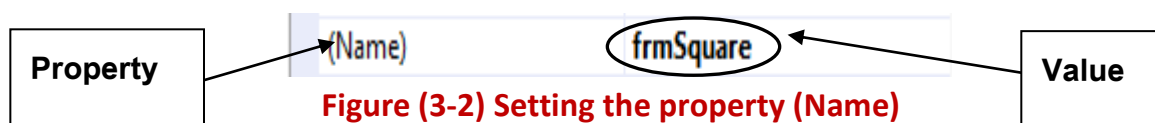
Figure (3-2) Setting the property (Name)

- Change the value of the (Text)Property to ("مساحة مربع") **as shown in figure (3–3).**

Text | مساحة مربع

Figure (3-3) Setting the property (Text)

- **The Form window will be displayed as shown in figure (3-4).**

Before setting the previous two properties	After setting the previous two properties
form1	مساحة مربع

Figure shows only the value of property (Text) and does not show the value of the property (Name); used when writing the code.

Figure (3-4) Form window before and after setting the property (Text), (Name)

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).

3–1–2 Setting properties

1. To Set the(BackColor) property for the Form (frmSquare)
   - Select the (BackColor) property and set its value to (DarkSeaGreen) **as shown in figure (3-5)**.

> (BackColor)
> (RightToLeft)
> (RightToLeftLayout)
> (MaximizeBox)
> (MinimizeBox)
> (ControlBox)
> (FormBorderStyle)

Figure (3-5) Setting the property (BackColor)

The Background color of the Form becomes (DarkSeaGreen) **as shown in figure (3-6)**.
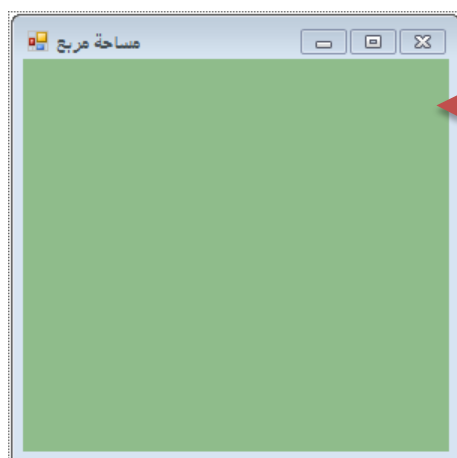
Figure (3-6) the Form window after setting the (BackColor) property

2. To adjust the writing direction Property for the Form (frmSquare).
   - Set the value of the Property (RightToLeft) to "Yes" **as shown in figure (3-7)**.
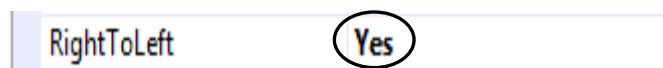
Figure (3-7) Setting the property (RightToLeft)

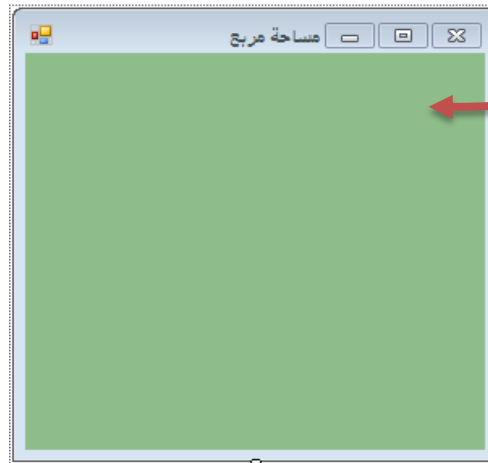The text shown on the Form is displayed from right to left (see figure (3-8)).

Figure (3-8) the Form window after setting the (RightToLeft) property

3. To adjust the Layout direction Property for the Form (frmSquare).

   – Set the value of the Property (RightToLeftLayout) to "True"
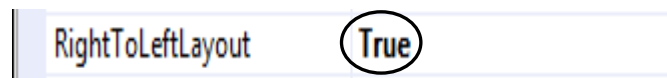   as shown in figure (3-9).

Figure (3-9) Setting the property (RightToLeftLayout)

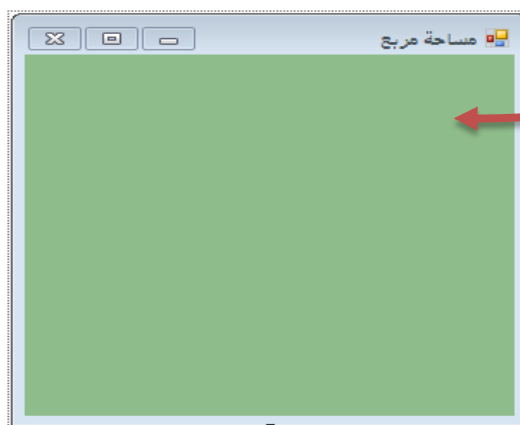The Layout direction of the Form will be from right to left as shown in figure (3-10).

Figure (3-10) the Form window after setting the (RightToLeftLayout) property

NOTICE

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

4. To hide the minimize and maximize buttons for the Form (frmSquare).
   - Select the properties (MaximizeBox, MinimizeBox) and set their values to (False) **as shown in figure (3-11).**
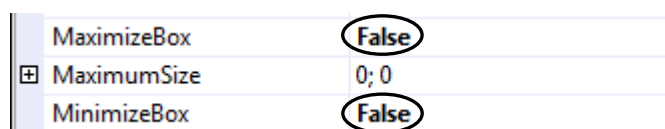

	MaximizeBox	False
⊞	MaximumSize	0; 0
	MinimizeBox	False

Figure (3-11) Setting the (MinimizeBox) and (MaximizeBox) properties

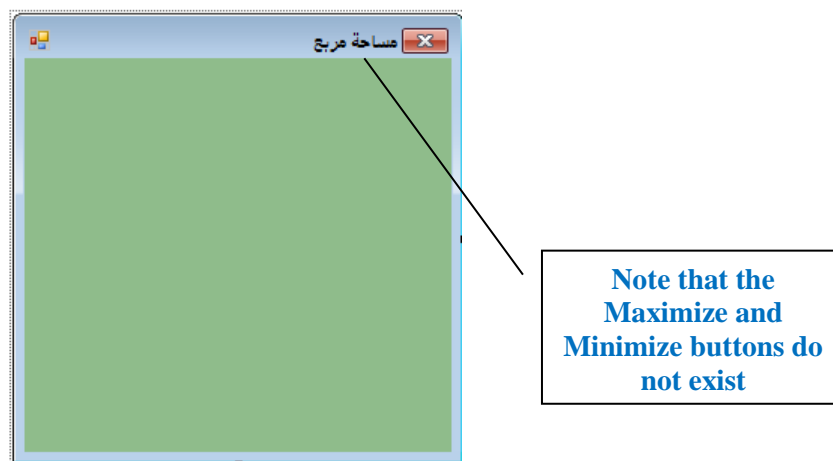The Minimize and Maximize buttons are hidden from the Form **as shown in figure (3-12).**

Note that the Maximize and Minimize buttons do not exist

Figure (3-12) the Form window after hiding the (MinimizeBox) and (MaximizeBox) buttons

5. To hide the Control Box for the Form (**frmSquare**).

- Select the property (ControlBox) and set its value to (False) **as shown in figure (3-13).**
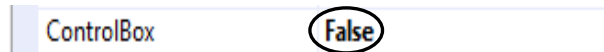

Figure (3-13) setting the (ControlBox) property

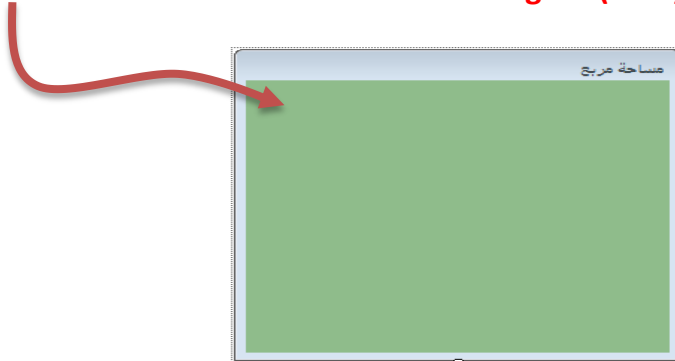The ControlBox is hidden **as shown in figure (3-14).**

Figure (3-14) the Form window after hiding the ControlBox.

6. To hide the Border for the Form (frmSquare).

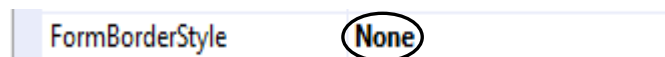- Select the property (FormBorderStyle) and set its value to (None) as shown in **figure (3-15).**

Figure (3-15) setting the (FormBorderStyle) property

The Form window became without borders (Borderless window) as shown in **figure (3-16).**

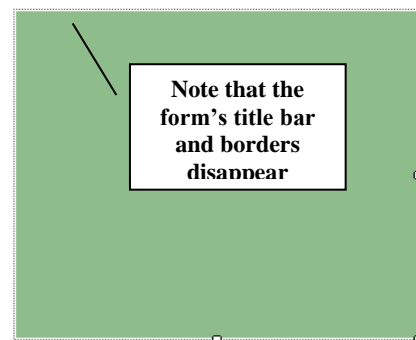Note that the form's title bar and borders disappear

**Figure (3-16) the Form window after hiding its Borders**

With your teacher's help

- Set the value of property (FormBorderStyle) to (Sizable).
- Display the (Minimize) button, the (Maximize) button and (ControlBox) on the title bar.

NOTICE

- The Property (FormBorderStyle) takes many values .The value (Sizable) makes it possible to control the Form' size; through its borders.

- When you adjust any Property of the properties stated before; its effect is shown on the Form immediately.

- There are some properties, where their effects on the Form or on other controls will be active, only if you start running the program (Run mode) or at the (Start Debugging mode).

- You can initiate the (Start Debugging mode) by clicking on the (Start Debugging) icon on the Standard Toolbar **as shown in figure (3−17)**.
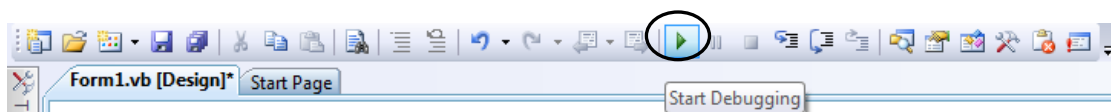
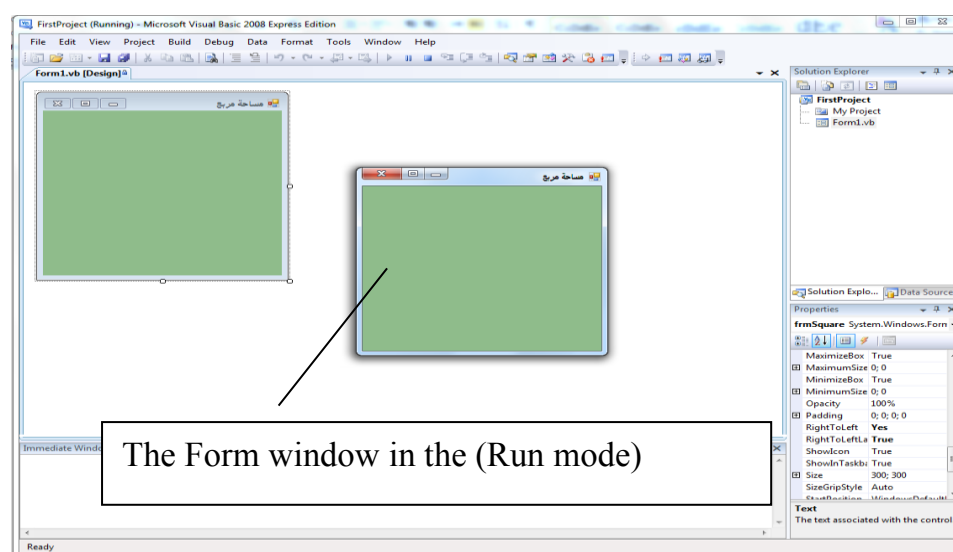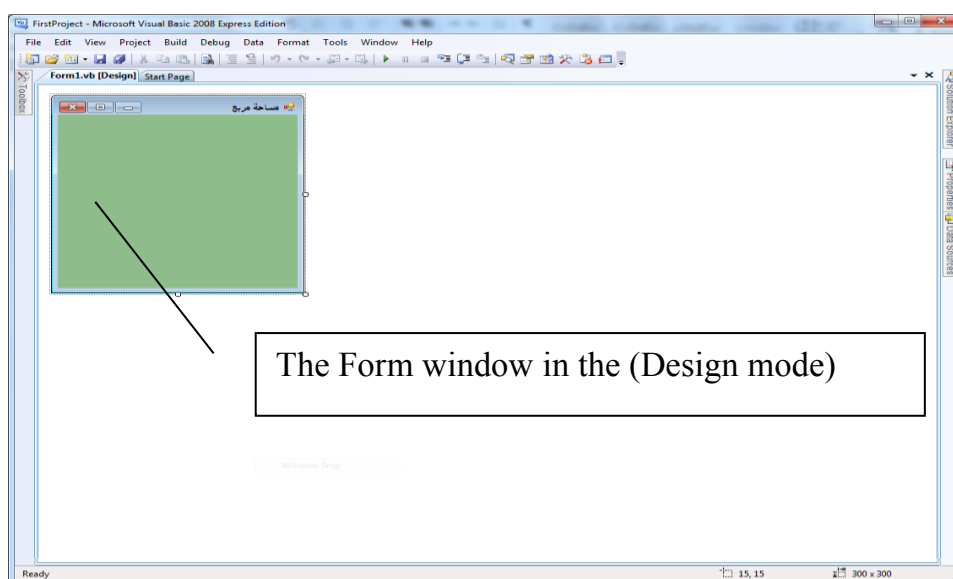**Figure (3-17) the (Start Debugging) icon on the Standard Toolbar**

3-1-2 Setting properties

Click on the (Start Debugging) icon.

(ShowInTaskbar)

(StartPosition)

(WindowState)

NOTICE

See the (IDE) screens before and after clicking on the (Start Debugging) icon **as shown in figure (3-18).**

**Figure (3-18) the Form in Design mode and Run mode**

NOTICE

You can stop the (Debugging) by clicking on (Stop Debugging) icon **as shown in figure (3−19)**.

Figure (3-19) (Stop Debugging) icon in the Standard Toolbar

7. To enable or disable the Form's icon to be displayed in the Taskbar and to adjust the Position of the Form when displayed on the screen; we adjust the shown properties of the Form (frmSquare) to (False) and (CenterScreen) **see figure (3-20).**
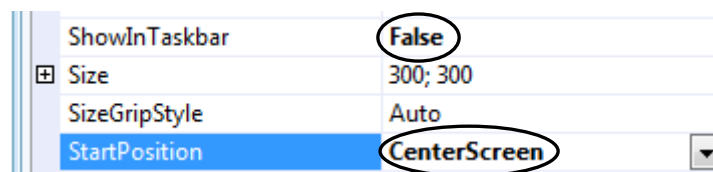
Figure (3-20) setting the (ShowInTaskbar) and (StartPosition) Properties

− Press (F5) button from the keyboard to start the Debugging.

NOTICE

1. The Form appears in the center of the screen, also the Form icon does not appear in the taskbar.
2. The effect of both (ShowInTaskbar) and (StartPosition) properties will not be active unless we start debugging the program.

8. To adjust the state of the Form's window (frmSquare).

− Select the value (Maximized) **as shown in figure (3-21).**

Figure (3-21) setting the (WindowState) Property

− Choose the (Debug) menu then select (Start Debugging) to start debugging.

NOTICE

> **1.** The Form's window is displayed in full screen.
>
> **2.** The effect of the Property (WindowsState) is active only when you start debugging the program.

From the above, we conclude that the properties assigned to the Form are as shown in Table (3-1).

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) .

Table (3-1) Form's Properties

3−2 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.

- Create a new (Project) and set up the (Form) **as shown in figure (3-22).**

Figure (3-22) the (Form)

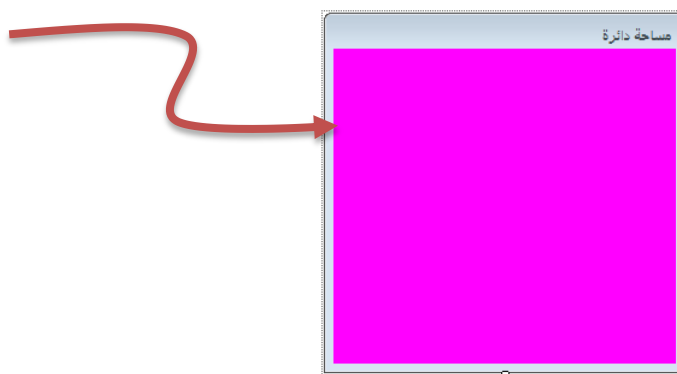## 3−2−1 Draw a Command Button on the (Form)

1. To place a Command Button on the form; in design mode. Move the mouse pointer to the Toolbox and double-click the Button icon **as shown in the figure (3-23).**
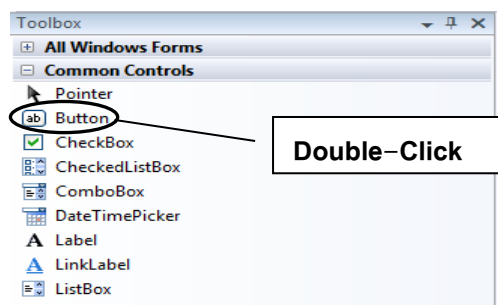

Figure (3-23) the Command Button in the Toolbox

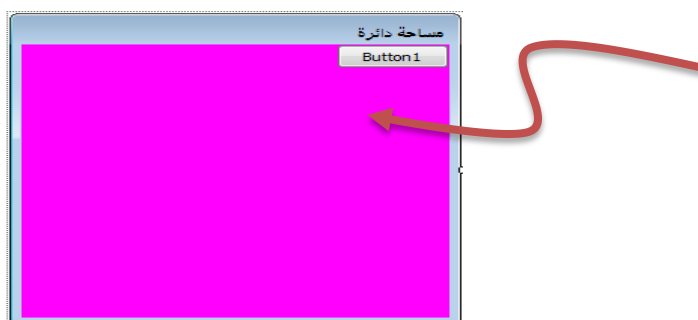- The Button is displayed on the Form **as shown in figure (3-24).**

Figure (3-24) the Command Button (Button1) displayed on the (Form)

$\left(\text{Location}\right)$

$\left(\text{Size}\right)$

3–2–2 Setting Properties

We will adjust the Controls' locations found on the Form ,by setting the Properties (Location) and (Size) for these Controls. In the Properties window, using the mouse pointer, you can select these Properties, and change their setting values.

2. Activate the Command Button (Buttton1) by clicking it.

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.**

3. Place the mouse pointer in the center of the (Button). Drag the (Button) to the middle of the (Form) as shown in figure (3-25) and figure (3-26).

Note the value of the (Location) property; it specifies the position of the Button on the (Form).
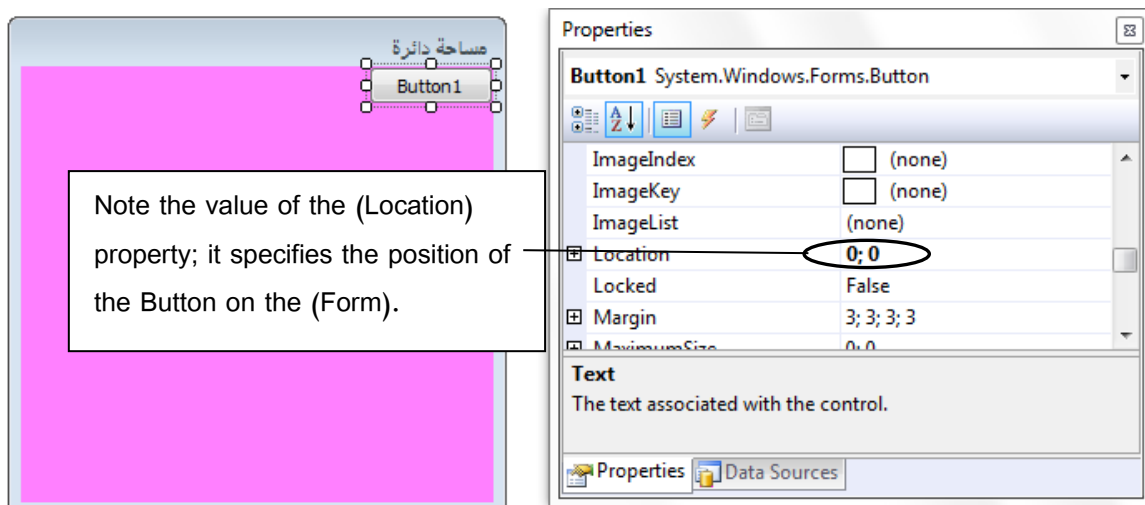
Figure (3-25) Location of the (Button) before clicking and dragging
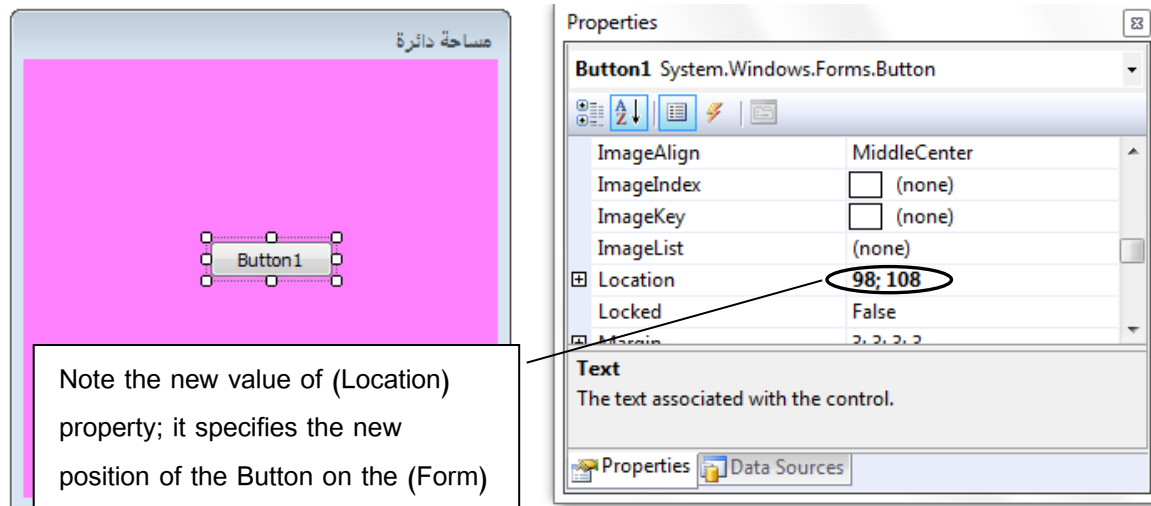
Figure (3-26) Location of the (Button) after clicking and dragging

4. **Place the mouse pointer on one of the boxes (sizing handles). Drag and Drop the mouse until the desired size is reached** **as shown in figure (3-27) and figure (3-28).**
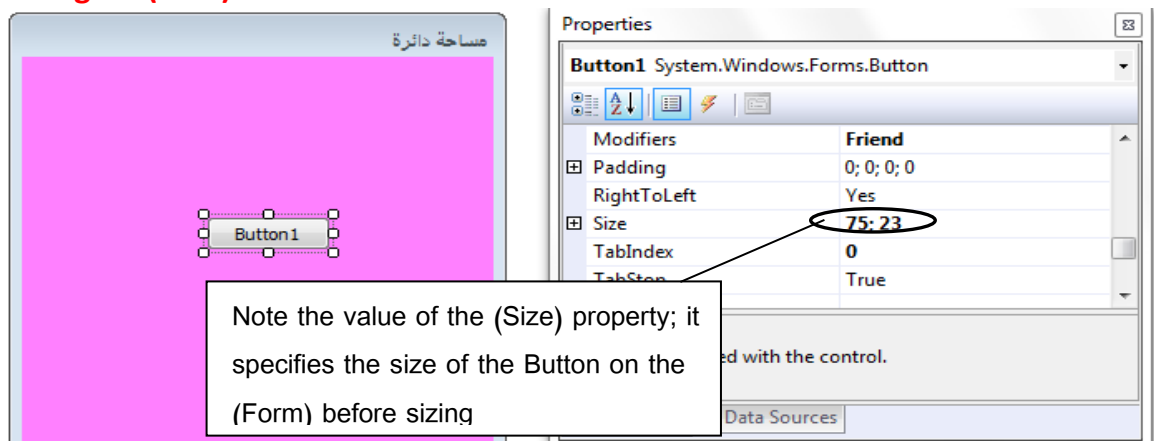

Figure (3-27) the Size of the (Button) before clicking and dragging one of the (Sizing handles)

Note the value of the (Size) property; it specifies the size of the Button on the (Form) after sizing
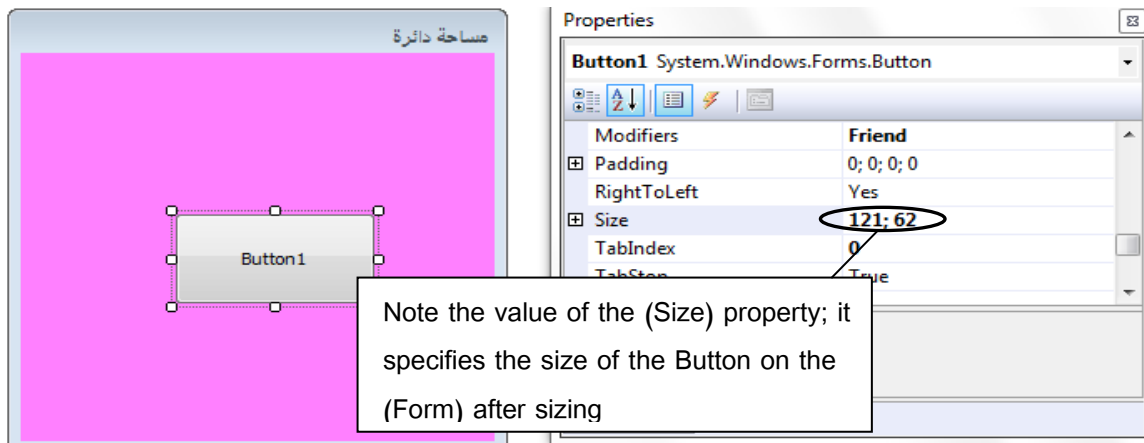
Figure (3-28) the size of the (Button) after clicking and dragging.

3–2–3 Setting Properties

(BackColor)

(Font)

(ForeColor)

5. **With the help of your teacher, adjust the following properties for (Button1)** **as shown in figure (3-29).**

Figure (3-29) setting the properties (Backcolor) , (Font) and (ForeColor) for (Button1)

After adjusting the previous (Properties) for (Button1); the background color becomes yellow, the text appearing on the button is " أحسب " , the foreground color is blue and, the Font 'style and size have been chosen **as shown in figure (3-30).**

Figure (3-30) the Command Button (Button1) after changing its Properties.

From the above mentioned figure, it is clear that, there are many (Properties) assigned to the control (Button) **as shown in Table (3-2).**

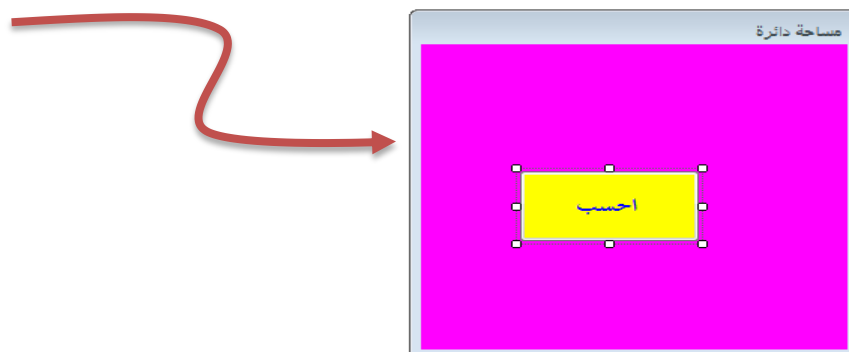| No.	Property	Function
1	Text	The text on the (Button).
2	ForeColor	The foreground color for the text on the (Button) or its (Font color).
3	BackColor	The background color for the (Button);(background color).
4	Font	The text's (Font, Size and Style) on the (Button).
5	Location	The location of the (Button)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

Table (3-2) Some of the Command Button's Properties

3–3 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.

3–3–1 Setting Properties

(AutoSize)

(BorderStyle)

1. On the previous Form, place the control (label1).
2. Adjust its properties **as shown in table (3-3)** ,you can ask your teacher for help.

Property	Value
Name	lblResult
Text	"النتيجة:"
ForeColor	Choose your favorite color
BackColor	Choose your favorite color
Font	Choose the font's type, style, and size you prefer.
AutoSize	False
BorderStyle	FixedSingle

Table (3-3) some of the Label's Properties.

3. Change the size of the control (label1) by clicking and dragging one of the sizing handles, so it becomes as shown in figure (3-31).
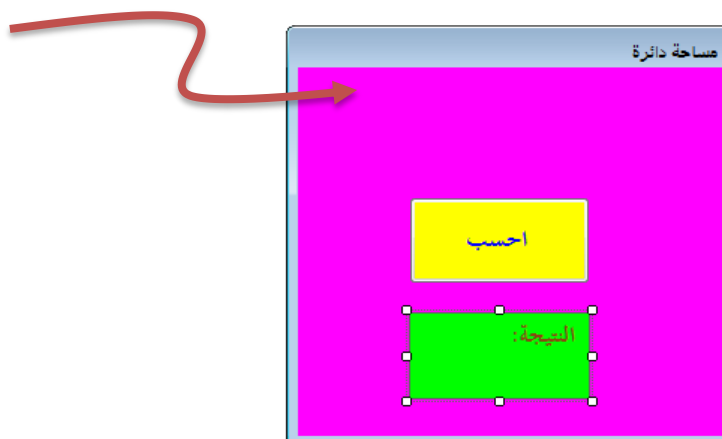
Figure (3-31) sizing the control (label1).

NOTICE

- **If the AutoSize property is set to False, you can manually adjust the size of the label.**

- **If the AutoSize property is set to True, the label size is automatically adjusted to fit the text displayed on the label.**

It becomes clear from the above that there are many (Properties) assigned to the control (Label) as shown in Table (3-4).

No.	Property	Function
1	AutoSize	Specifies whether the size of the control (Label) is automatically adjusted by text written
2	BorderStyle	Specifies the border style of the control (Label)

Table (3-4) some of the Label's Properties

NOTICE

- **The control (Label) has a set of properties like (Name –Text –Font – ForeColor – BackColor – Visible – Size – Location – RightToLeft – Image); you can deal with as you learned earlier in this chapter.**

3–4 TextBox

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

3–4–1 Setting Properties

(MaxLength)
(PasswordChar)
(MultiLine)

1. **Create a new project so that the Form's window will be as shown in figure (3-32).**

TextBox1

TextBox2

TextBox3

The control (Label)

الدخول في البرنامج

الاسم

كلمة المرور

ملاحظات

The controls (Label)

مستخدم جديد   دخول
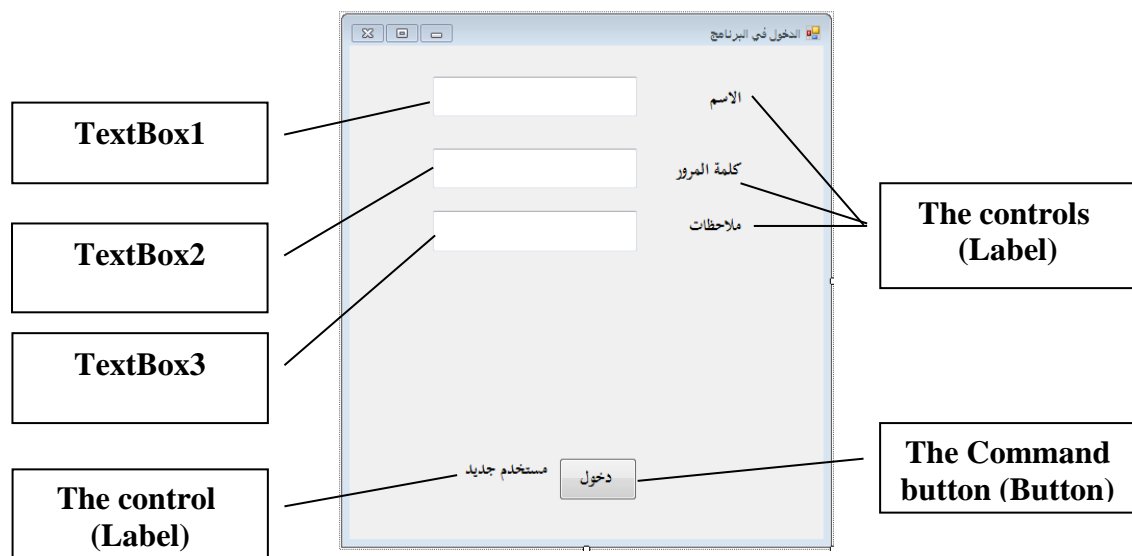
The Command button (Button)

Figure (3-32) the required Form's window to be designed

2. **In the TextBox (TextBox1) set the value of (MaxLength) property to (30) , where the user can enter the "Name"; and cannot type more than 30 characters; see the following setting :**

Property	value
MaxLength	30

3. In the TextBox (TextBox2) set the value of (PasswordChar) property to (*) , where the user can enter the "Password" ;that appears in form of (*) **as follows :**

Property	value
PasswordChar	*

4. In the TextBox (TextBox3) set the value of (MultiLine) property to (True) , where user can enter the "Notes" in multiple lines **as follows :**

Property	value
MultiLine	True

The Form's window appears as follows during the run-time; it displays data entered by the user **as shown in figure (3-33).**

Figure (3-33) Form window after entering required data

It becomes clear from the above that the control (TextBox) has special (Properties) **as shown in Table (3-5).**

No.	Property	Function
1	**MaxLength**	Specifies the maximum number of characters that user can write in the (TextBox) .
2	**PasswordChar**	Specifies the symbol that will be displayed instead of the text written; as example: creating a Password.
3	**MultiLine**	Determines whether the (TextBox) control allows multiple lines.

Table (3-5) some of the TextBox's Properties

NOTICE

- **The control (TextBox) has a set of properties like (Name –Text –Font – ForeColor – Visible – Size – Location – RightToLeft – Enabled); you can deal with as you learned earlier in this chapter.**

3–5 ListBox

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

3–5–1 Setting Properties

(Items)

(SelectionMode)

(Sorted)

1. Based on what you have learned; create a new project so that the form's window contains a (Button) and, a (ListBox) as shown in figure (3-34).
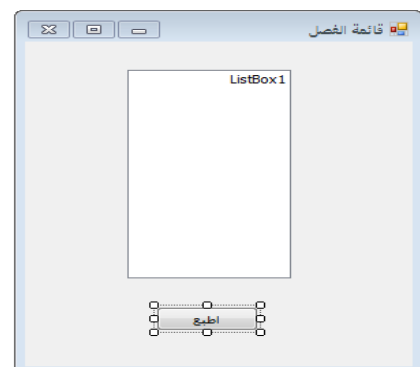
Figure (3-34) the Form window after inserting a (ListBox).

2. Adjust the (ListBox) Properties **as shown in table (3-6).**

Property	Value
Items	عمرو رامي ياسمين سمر
SelectionMode	MultiExtended
Sorted	True

Table (3-6) setting some of the ListBox's Properties

When we adjust the property (Items) the following (Editor Box) will be displayed **as shown in figure (3-35).**
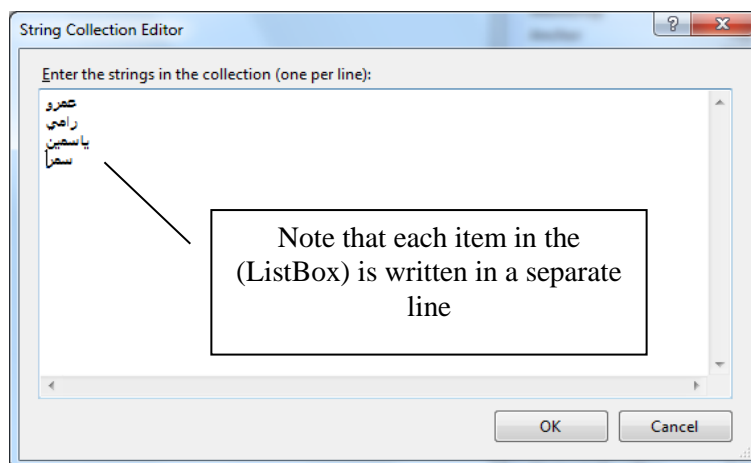
Figure (3-35) the items written in the (ListBox)

So, the form's window appears in run-time **as shown in figure (3-36).**
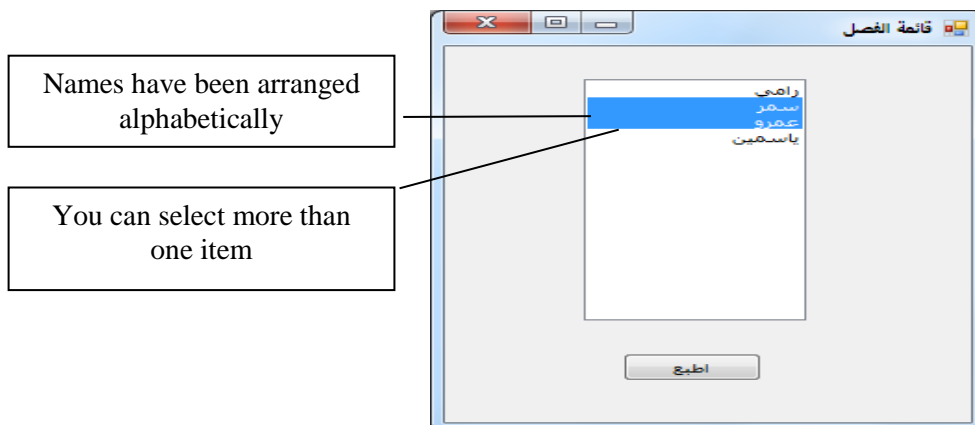
Figure (3-36) (ListBox) as it appears in the run-time mode

It becomes clear from the above that the control (ListBox) **has special** (Properties) **as shown in Table (3-7).**

No.	Property	Function
1	Items	Presents a set of items displayed in the (ListBox)
2	Sorted	Specify whether the items are arranged or not
3	SelectionMode	Determine whether it is possible to select one or more item displayed in the (ListBox).

Table (3-7) some of the ListBox's Properties

NOTICE

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

3–6 ComboBox

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

3–6–1 Setting Properties

(AutoCompleteMode)
(AutoCompleteSource)

1. **Create a new project so that the form's window contains two (Label) controls and one (ComboBox) control as shown in figure (3-37).**
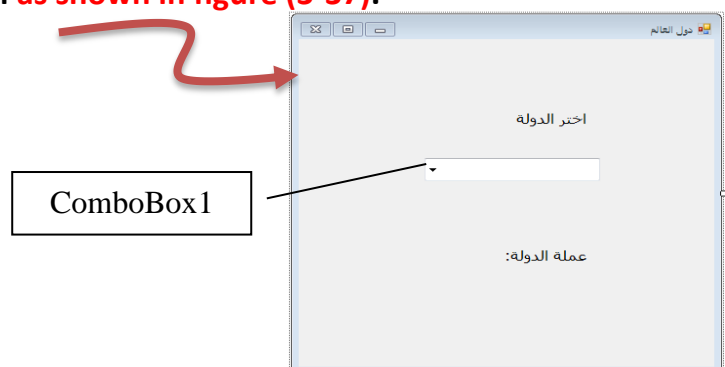
دول العالم

اختر الدولة
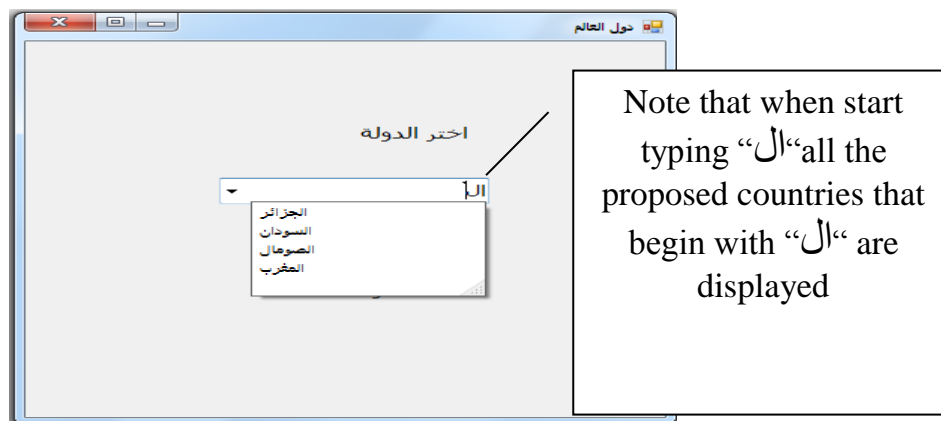
ComboBox1

عملة الدولة:

Figure (3-37) (ComboBox) control

2. Adjust the properties of the (ComboBox) **as shown in table (3-8)** ,you can ask your teacher for help.

Property	Value
Items	"مصر السودان جيبوتي اريتريا الصومال ليبيا تونس الجزائر المغرب موريتانيا " Note that :each country name ,should be written in a separate line
AutoCompleteMode	Suggest
AutCompleteSource	ListItems

Table (3-8) setting ComboBox's Properties

So, the Form window appears in run-time **as shown in figure (3-38).**

Figure (3-38) (ComboBox) control in the run-time mode

It becomes clear from the above mentioned figure that the control (ComboBox) has many (Properties) **as shown in Table (3-9).**

No.	Property	Function
1	**Items**	Presents the items in the (ComboBox)
2	**AutCompleteSource**	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.

Table (3-9) some of the ComboBox's Properties

NOTICE

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

3–7 GroupBox

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

3–7–1 Setting some of the (GoupBox) control (Properties)

There are many properties for the (GroupBox) control.

1. With your teacher's help, construct a (GroupBox) control using the following properties as shown in table (3-10) to obtain the Form shown in figure (3-39).

No.	Property	value
1	Text	النوع
2	ForeColor	Choose your favorite color
3	RightToLeft	Yes

Table (3-10) setting the GroupBox's Properties

The GroupBox before setting its properties.	The GroupBox after setting its properties.
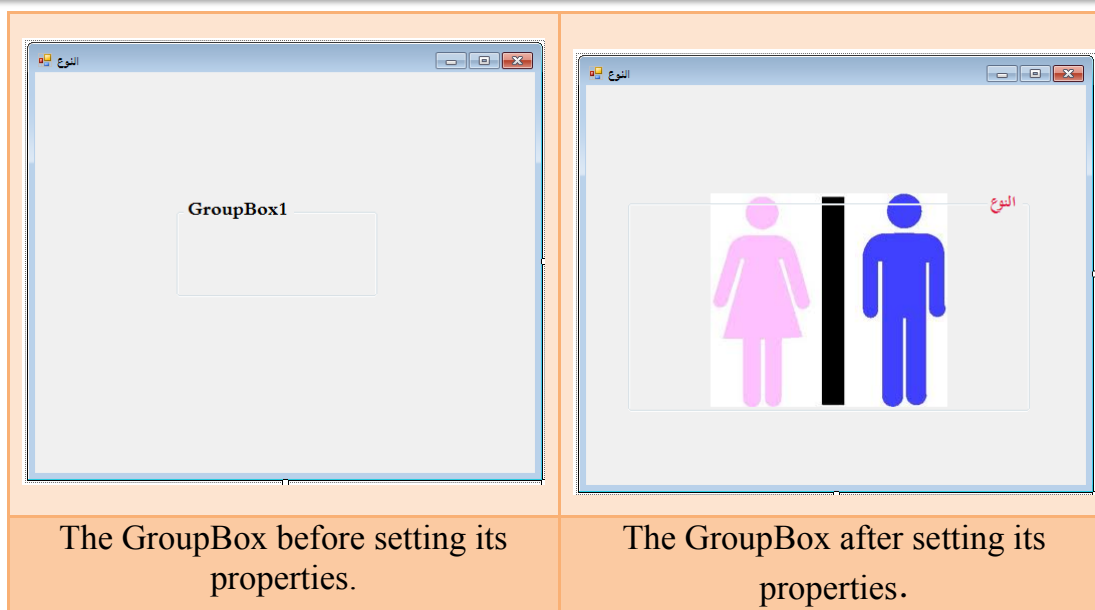
Figure (3-39) (GroupBox) control before and after setting its properties

NOTICE

1. The control (GroupBox) 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.

2. The property (BackgroundImage) is used to display the image in the background of the control (GroupBox). Start setting this property with your teacher's help.

3–8 RadioButton

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

3–8–1 Dealing with (RadioButton)

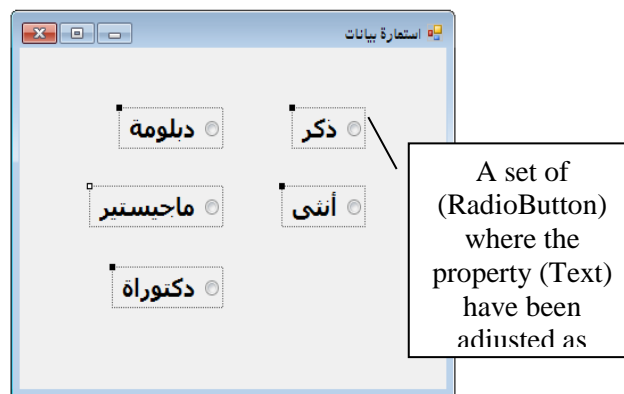1. Create a new project so that the Form's window will be as shown in figure (3-40).

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

Figure (3-40) A set of (RadioButton)

With your teacher's help, set RadioButton's properties as follows:

Property	value
Checked	True

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

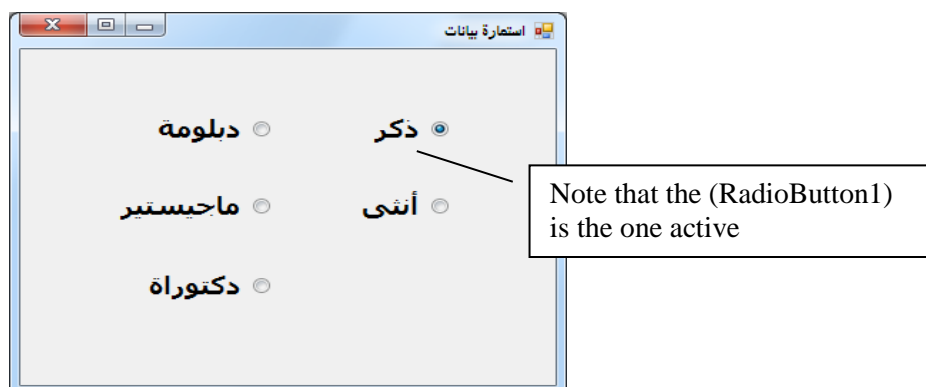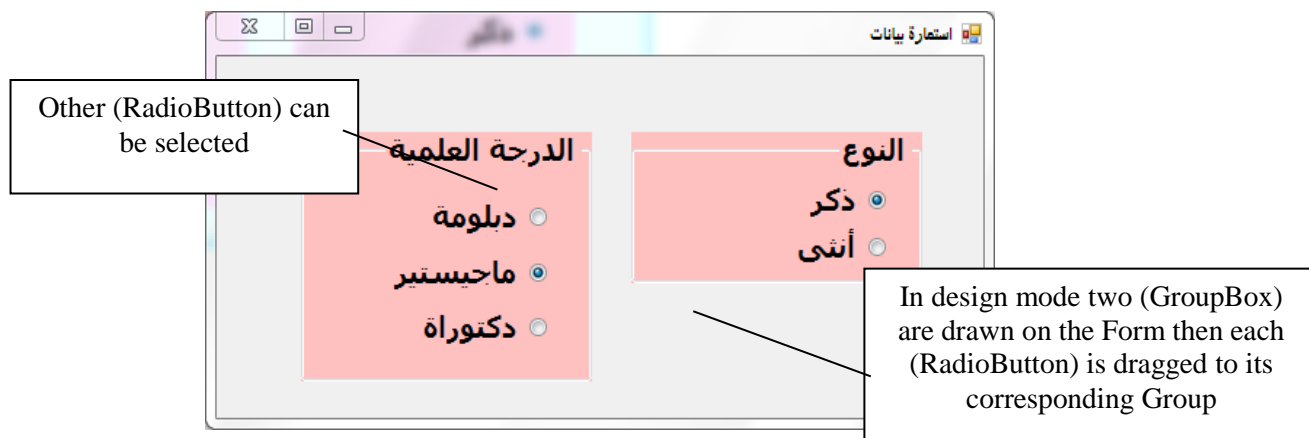**Figure (3-41) Choosing one of the (RadioButton)**

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).

Other (RadioButton) can be selected

In design mode two (GroupBox) are drawn on the Form then each (RadioButton) is dragged to its corresponding Group

Figure (3-42) Choosing one (RadioButton) from each (GroupBox)

From the previously mentioned figure it is clear that there are many (Properties) assigned to the (RadioButton) as shown in Table (3-11).

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

Table (3-11) some of the (RadioButton) Properties

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**

3–9 CheckBox

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

3–9–1 Working with (CheckBox)

1. Create a new project so that the form's window will be as shown in figure (3-43).

اللغات التي يجيدها الطالب

انجليزي

فرنسي

الماني

أخرى

A set of (CheckBox), where the property (Text) for each one is adjusted
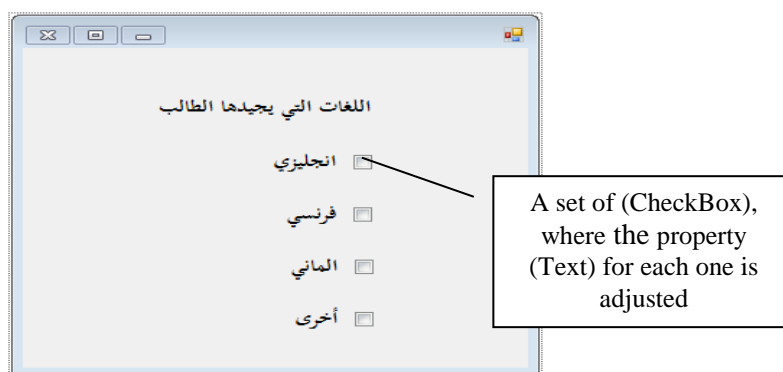
Figure (3-43) a set of (CheckBox)

So, the form's window appears in run-time as shown in figure (3-44).

اللغات التي يجيدها الطالب

انجليزي ☑

فرنسي ☑

الماني ☐

أخرى ☑

You can select more than one item

Figure (3-44) a set of (CheckBox)

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**

Questions

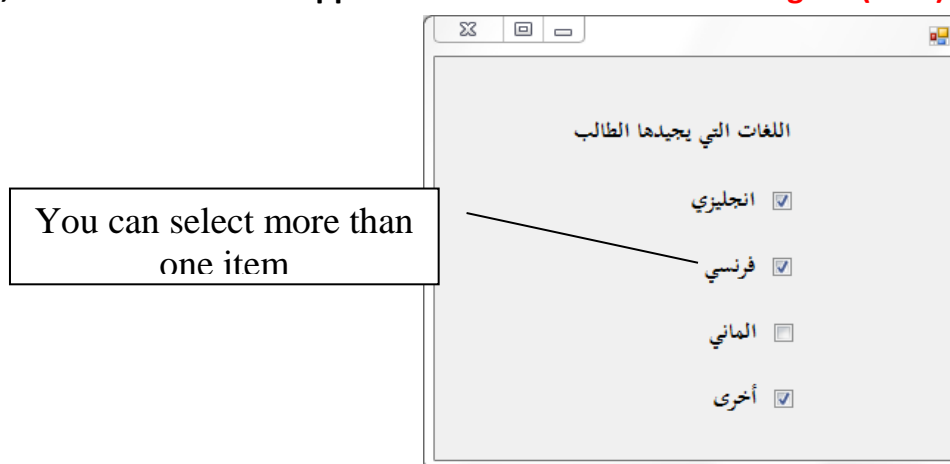**First :State whether the following statements are true (T) or false (F):**

1. Some (Properties) are not effective unless other (Properties) are adjusted first	( )
2. When you create a new (Project) a (Form) window is added to work with.	( )
3. There are no common (Properties) between one (Control) and another.	( )
4. A value should be assigned to any (Property).	( )
5. You can modify the value of a property assigned to a (Control) through the (Toolbox)	( )
6. The value of the (Property) Size is 98;108 means that the width is 108 and, the height is 98	( )
7. Radio Buttons are used when the user has the possibility to choose more than one alternative.	( )
8. User can not choose any item in the control (CheckBox)	( )

Second: choose the correct answer:

1. To provide the possibility to choose one and only one item use the control:

   A.RadioButton   B−Checkbox

   C − GroupBox   D−ListBox

2. To allow the selection of one or more items choose the control:

   A.RadioButton   B−Checkbox

   C−GroupBox   D− ComboBox

3. You can choose more than one item if you use:

   A−ListBox   B− ComboBox

   C−GroupBox   D−RadioButton

4. The Solution Explorer window contains:

   A−(Properties)   B (Controls)

   C−Projects   D−All of the above

5. The project can run in test mode by pressing (......) From the keyboard

   A−F2   B−F4

   C−F8   D−F5

Third: **Type the names of the Controls displayed on the shown Form window:**

برنامج حساب النتيجة

عربي

كمبيوتر

مجموع

النتيجة

No.	(Control)
1	
2	
3	
4	
5	
6	

Fourth

1. Write the name of the (Property) that enables you to control the size of the Control (Label) using mouse pointer.

2. Write the name of the (Property) that makes the writing direction from right to left.

3. Write the name of two (Properties) that have no effect unless you initiate the (Start Debugging).