

## Objectives

### Program Purpose

- Design a simple number guessing game
- The computer generates a hidden number between 1 and 25
- The user guesses whether it is even or odd
- A message displays whether the user guessed correctly or not

### Learning Goals

- Use of option buttons
- Use of a Boolean variable
- Use of comments in the code
- Use of 'If\_Then\_Else\_ElseIf\_End If' statements
- Use of a 'Randomize' statement

## Design Notes

The icon property of the form is used. This displays the small icon in the top-left corner of the form, besides the form's caption. These '.ico' files are usually installed in the following folder:  
`C:\Program Files\Microsoft Visual Studio\Common\Graphics\Icons'`

Another property introduced here is the 'Startup Position' of the form. Setting this to 2 (centre screen) saves manually positioning the form.

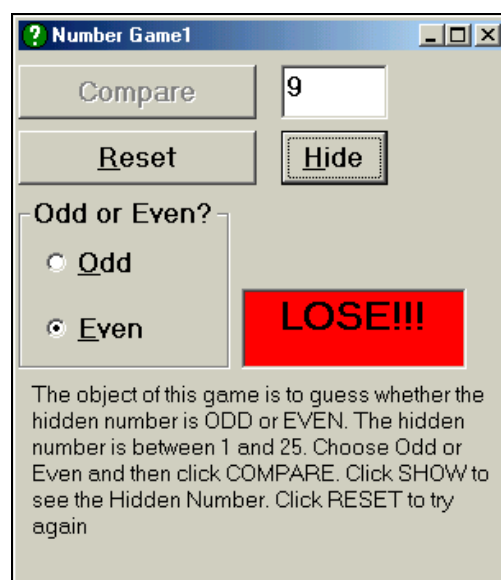
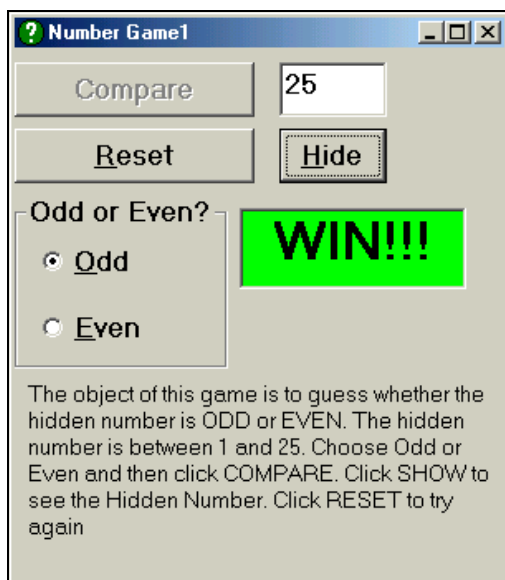
The initial properties are very important in this project. Pay particular attention to the 'Enabled', 'Visible' and 'Value' properties.

It is not necessary to name a label or frame if they serve no other purpose than displaying a message or to contain option buttons. Similarly, a form is only named if it is addressed in the code.

A variable is used to store information temporarily. A Boolean variable can have only 2 values (True or False). It is 'declared' with a DIM statement in the general section of the program.

## Interface

The Interface has 2 hidden labels, one of which is made visible (which one depends on the user's guess). The command button 'cmdHide' should have the caption '&Show'. This will change during the execution of the program.



## Names of Objects

Type of Object	Number	Names of Objects
Form	1	Form1
TextBox	1	txtDisplay
Command Button	3	cmdCompare, cmdReset, cmdHide
Frame	1	No name -Frame1
Option Button	2	optOdd optEven
Label	3	lblWin lblLose Label1

## Initial Properties of Objects

Object	Property	Initial Value
Form	Caption	Number Game 1
	Startup Position	2-Center Screen
	Icon	Browse for an "ico" file: see Design Notes above
txtDisplay	Text	""
	Visible	False
cmdCompare	Caption	&Compare
	Enabled	False
	Value	True
cmdReset	Caption	&Reset
	Enabled	False
cmdHide	Caption	&Show
	Enabled	False
optEven	Caption	&Even
	Value	True
optOdd	Caption	&Odd
	Value	True
Label1	Caption	The object of this game is to guess whether the hidden number is ODD or EVEN. The hidden number is between 1 and 25. Choose Odd or Even and then click COMPARE. Click SHOW to see the Hidden Number. Click RESET to try again
	Caption	WIN!!
	BackColor	GREEN
	Font	18 Bold
	Visible	False
lblLose	Caption	LOSE!!
	BackColor	RED
	Font	18 Bold
	Visible	False
Frame1	Caption	Odd or Even?

## Events – Code

### Private Sub cmdCompare\_Click()

*'work out whether or not the number is even  
'MOD gives the remainder after division  
'VAL converts text to a number  
'The next line declares a boolean variable  
'This stores a value of true or false*

Dim Even As Boolean

*'first determine if the number is even or not*

```
If Val(txtDisplay.Text) Mod 2 = 0 Then 'its even  
    Even = True  
Else  
    Even = False  
End If
```

*'now compare the User's Guess with ..  
'the value of the variable Even*

```
If Even = True And optEven.Value = True Then  
'we picked even and it was even
```

```
    lblWin.Visible = True  
ElseIf Even = False And optOdd.Value = True Then  
'we picked odd and it was odd
```

```
    lblWin.Visible = True  
Else 'we picked wrong  
    lblLose.Visible = True  
End If
```

*'disable compare button so it can't be clicked until  
'reset*

```
cmdCompare.Enabled = False  
cmdHide.Enabled = True
```

**End Sub**

### Private Sub cmdHide\_Click()

*'if the text box is displayed it hides it  
'otherwise it shows it*

```
If txtDisplay.Visible = True Then 'Hide it!  
    cmdHide.Caption = "&Show"  
    txtDisplay.Visible = False  
Else 'Show it  
    cmdHide.Caption = "&Hide"  
    txtDisplay.Visible = True  
End If
```

**End Sub**

### Private Sub cmdReset\_Click()

*'reset all the buttons and boxes*

```
txtDisplay.Visible = False  
cmdHide.Caption = "&Show"  
lblWin.Visible = False  
lblLose.Visible = False  
cmdCompare.Enabled = True  
cmdHide.Enabled = False
```

*'generate a new random number  
'randomly generates a number between 1 and 25  
'and displays it in the textbox*

```
Randomize  
txtDisplay.Text = Int(Rnd * 25 + 1)
```

**End Sub**

### Private Sub Form\_Load()

```
Randomize  
txtDisplay.Text = Int(Rnd * 25 + 1)
```

**End Sub**

## Further Design Notes

- Comments are used to display information for the programmer. The use of an apostrophe at the start of the line indicates it is a comment and not code. It will be ignored at runtime.
- The MOD operator gives a remainder. This is useful for checking if a number is even or not.
- The VAL function converts text to a number. Its use prevents odd results where strings are converted into their underlying ASCII value.
- Mistakes are easily made if variables are spelt or typed differently. To prevent this, the programmer should check 'Require Variable Declaration' under the 'Tools' – 'Options' menu.