

COMP1022Q

Introduction to Computing with Excel VBA

Making Decisions with VBA

Gibson Lam and David Rossiter

Outcomes

- After completing this presentation, you are expected to be able to:
 1. Write VBA code to make decisions using the `If` statement

Making Decisions in VBA

- We have already discussed how to make decisions using the cell formula function `IF`
- In this presentation, we will show how to make similar decisions using the VBA `If` statement

Using the If Statement

- The `If` statement that handles only the true part is written like this:

```
If condition Then  
    . . . true part . . .  
End If
```

- It is very similar to the `IF` formula function but you need to write the condition and the true part in separate lines of code
- The true part itself can have many lines of code inside the lines `If` and `End If`

A Simple If Example

- Here is a simple example using the `If` statement:

```
Dim Age
```

```
Age = InputBox("How old are you?")
```

```
If Age >= 18 Then
```

This is the condition

```
    Range("B4").Value = _
```

The _ simply means the code is continued on the following line

```
    "Naughty stuff here..."
```

This true part is code which changes the content of cell B4

```
End If
```

Running the Example 1/2

```
Dim Age
Age = InputBox("How old are you?")
```

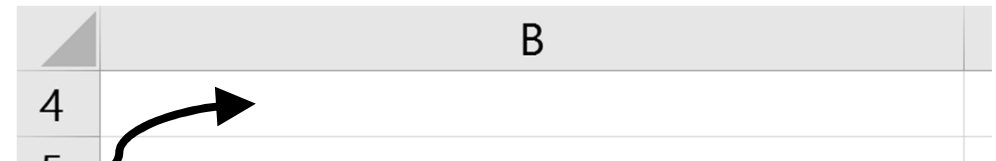
```
If Age >= 18 Then
```

```
    Range("B4").Value = _  
        "Naughty stuff here..."
```

```
End If
```



$16 \geq 18$
i.e. False



*Nothing is shown in cell B4
because the If statement does
not run the true part*

Running the Example 2/2

```
Dim Age  
Age = InputBox("How old are you?")
```

```
If Age >= 18 Then
```

*20 >= 18
i.e. True*

```
    Range("B4").Value =  
        "Naughty stuff here..."
```

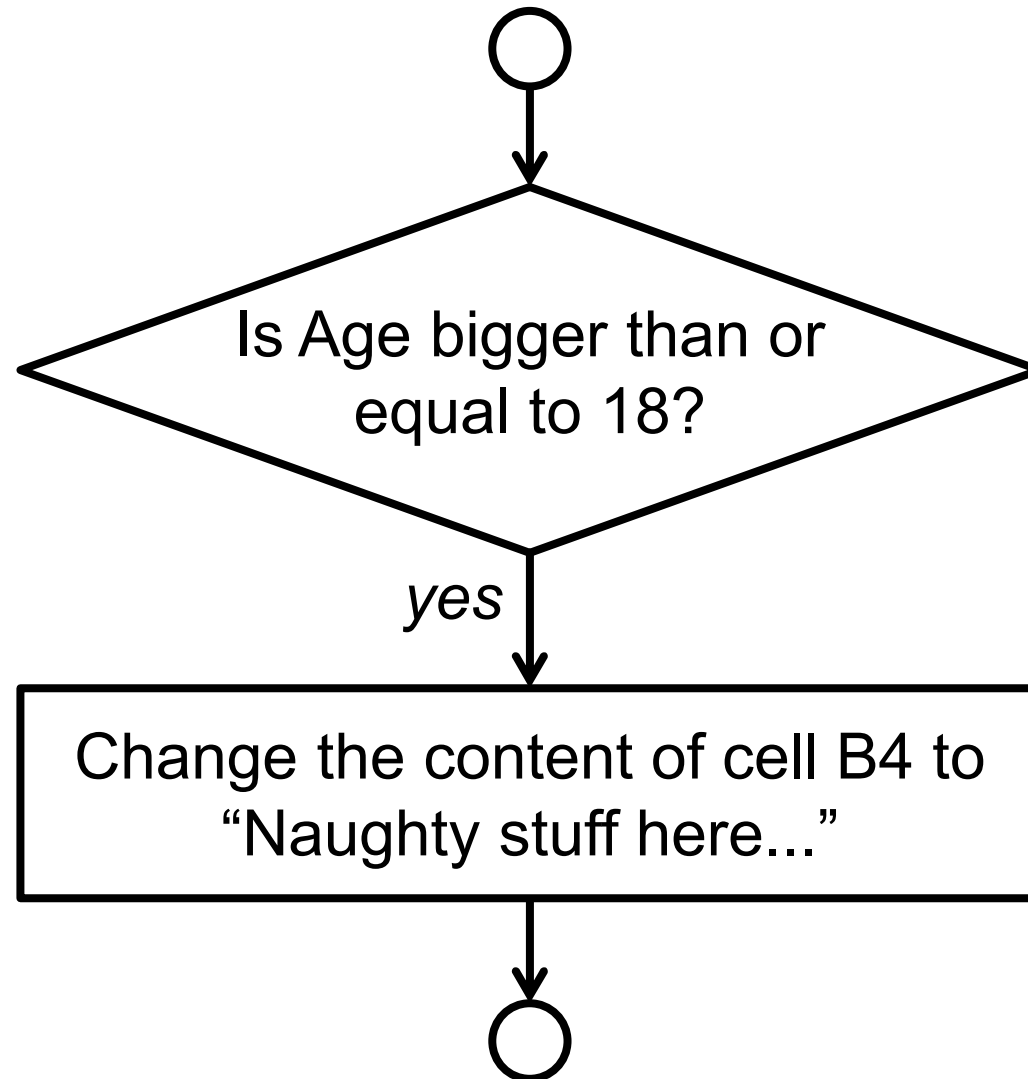
```
End If
```



	B
4	Naughty stuff here...

*Text is shown this time
because the If statement
runs the true part*

The Flow of the If Example



Indentation

- You can see that the `If` statement is written so that there are spaces at the start of the true part

```
If Age >= 18 Then
    → Range("B4").Value = _
      "Naughty stuff here..."
End If
```

- Leaving spaces at the start of some code is called *Indentation*
- Indentation is useful because it tells you the structure of the code, i.e. the code in the true part is ‘inside’ the `If` statement (although you don’t *have* to use indentation when you write VBA code)

Extending the If Statement Using Else

- Like the `IF` cell formula function, you can handle both a true part and a false part

- To do that you use
`Else` to include the false part into the statement, like this:

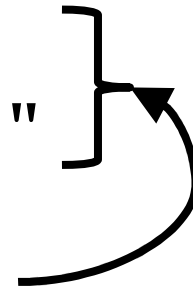
```
If condition Then
    . . . true part . . .
Else
    . . . false part . . .
End If
```

Extending the Example Using Else

- The previous example can be easily extended to have the false part

```
If Age >= 18 Then
    Range("B4").Value = _
        "Naughty stuff here..."
Else
    Range("B4").Value = _
        "Let's watch Tele BB"
End If
```

This is the false part



Running the Example

Microsoft Excel

How old are you?

OK

Cancel

16



	B
4	Let's watch Tele BB



Microsoft Excel

How old are you?

OK

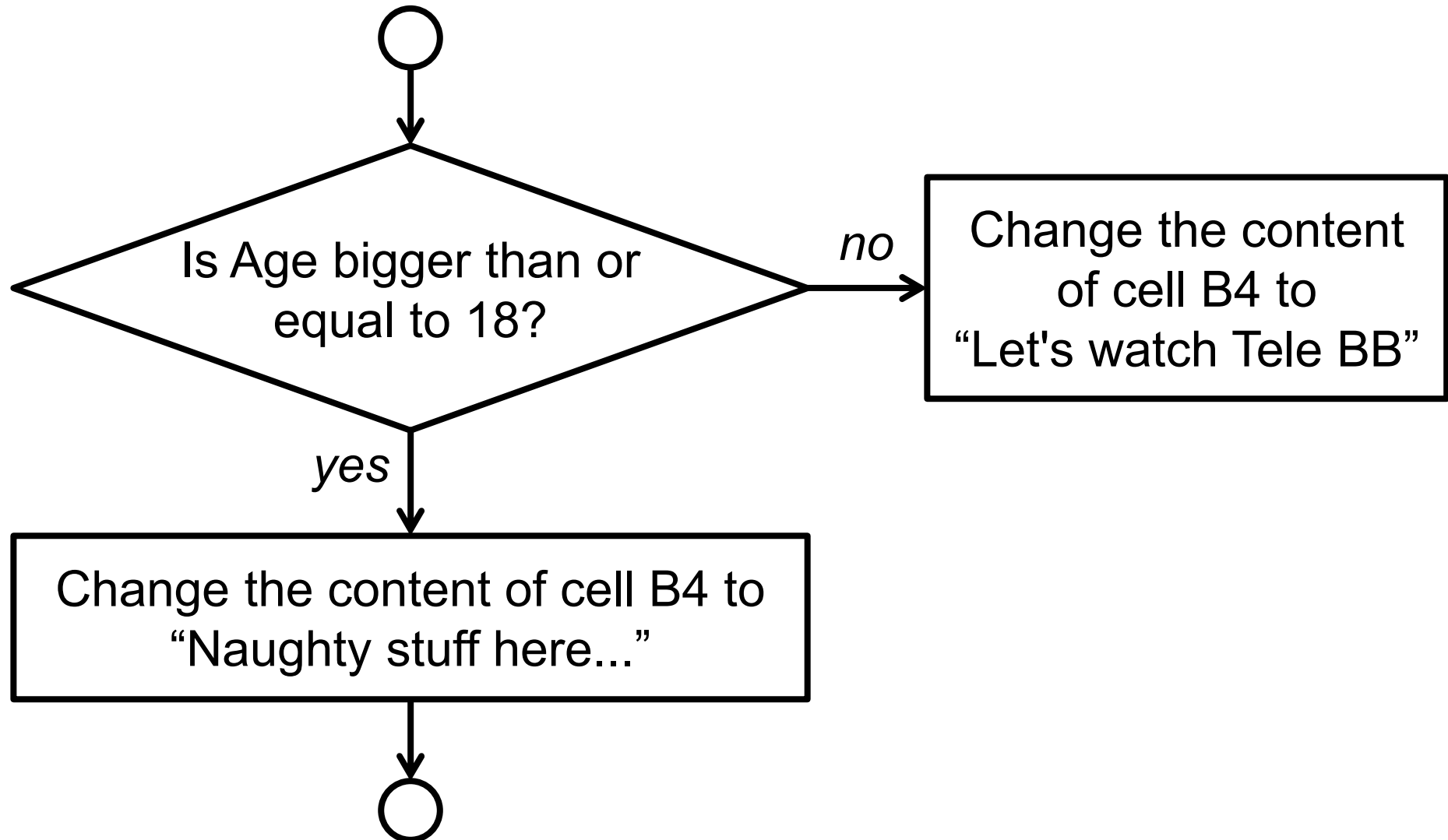
Cancel

20



	B
4	Naughty stuff here...

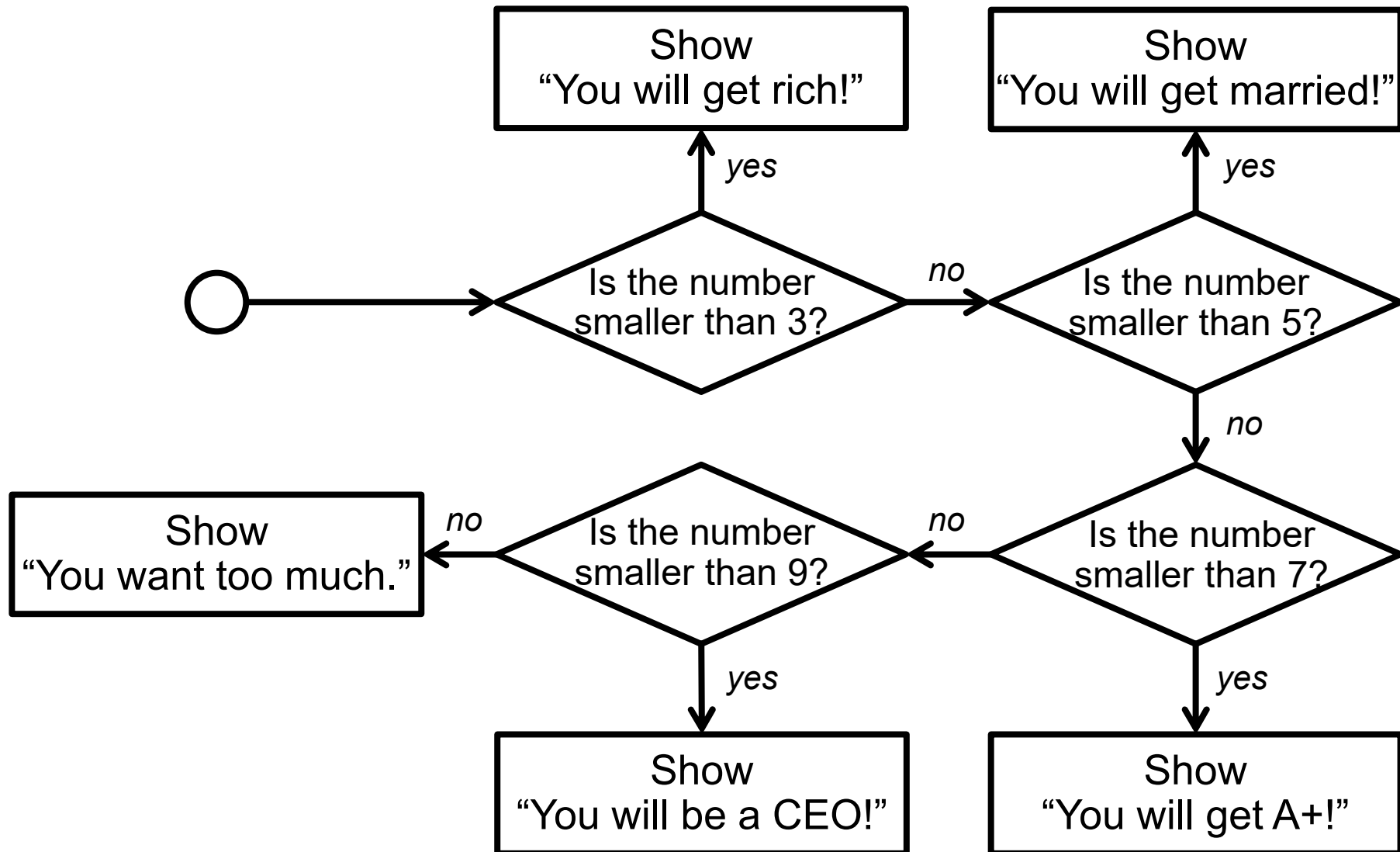
The Flow of the Extended If Example



A Fortune Teller Program

- Let's build a fortune teller program
- The program first asks the player for his/her favourite number in the range of 1 to 10
- The program will then tell the player a lucky (or unlucky) message using the logic shown on the next slide

The Fortune Teller Logic

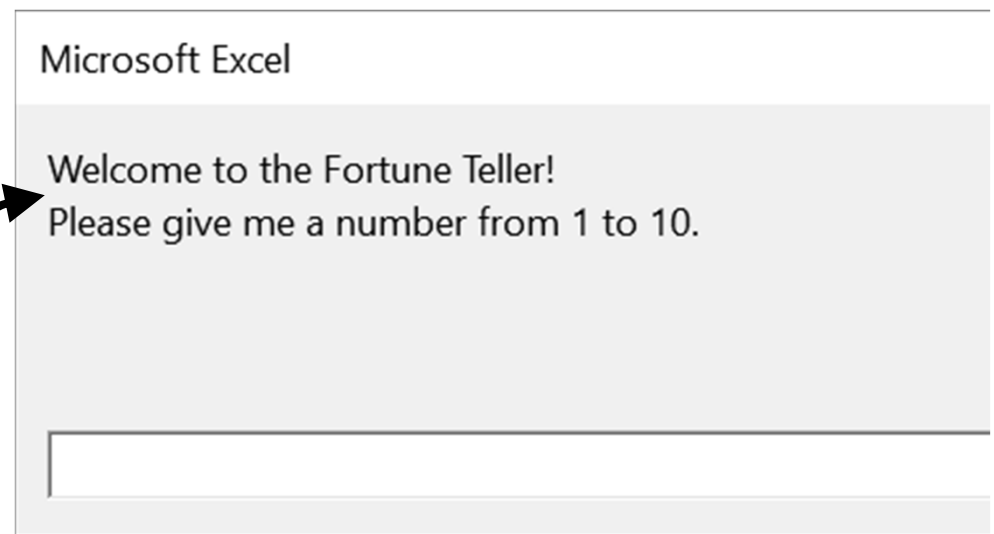


Showing the Question

- The fortune teller program uses the following code to ask the question:

```
Number = InputBox("Welcome to the Fortune Teller!" & _  
                  vbNewLine & _  
                  "Please give me a number from 1 to 10.")
```

- The `vbNewLine` asks VBA to move to the next line in the middle of the text



Nested If Statements

- A nested If statement is an If statement that is inside another If statement, for example:

```
If condition1 Then
```

```
    If condition2 Then
```

```
        . . .
```

```
    End If
```

```
Else
```

```
    . . .
```

```
End If
```

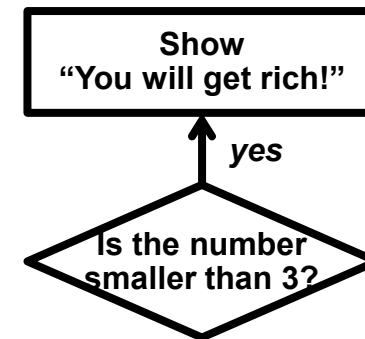
A nested If statement can be inside either the true part, false part or both of another If statement; in this example, it is inside the true part

- The fortune teller program requires a nested if structure because some conditions depend on the outcome of another condition

Build the Fortune Teller Logic

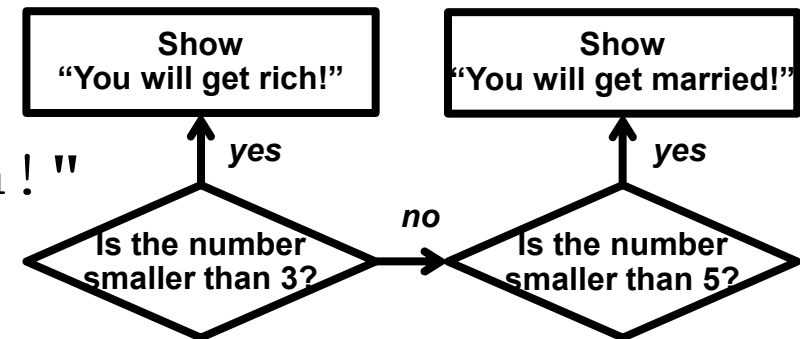
- We can build the logic one at a time
 - Adding the first condition:

```
If Number < 3 Then
    MsgBox "You will get rich!"
End If
```



- Then the second condition:

```
If Number < 3 Then
    MsgBox "You will get rich!"
Else
    If Number < 5 Then
        MsgBox "You will get married!"
    End If
End If
```



The Entire If Statement

- After adding all the conditions, the code will look like this:
- This code works fine but the number of indentation (i.e., number of nested Ifs) keeps increasing
- The code is not easy to read

```
If Number < 3 Then
    MsgBox "You will get rich!"
Else
    If Number < 5 Then
        MsgBox "You will get married!"
    Else
        If Number < 7 Then
            MsgBox "You will get A+!"
        Else
            If Number < 9 Then
                MsgBox "You will be a CEO!"
            Else
                MsgBox "You want too much."
            End If
        End If
    End If
End If
End If
```

Using ElseIf

- VBA gives you an alternative to write Else...If with ElseIf, i.e.:

```
If condition1 Then
```

```
    ...
```

```
Else
```

```
    If condition2 Then
```

```
        ...
```

```
    End If
```

```
End If
```

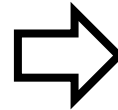
```
If condition1 Then
```

```
    ...
```

```
ElseIf condition2 Then
```

```
    ...
```

```
End If
```



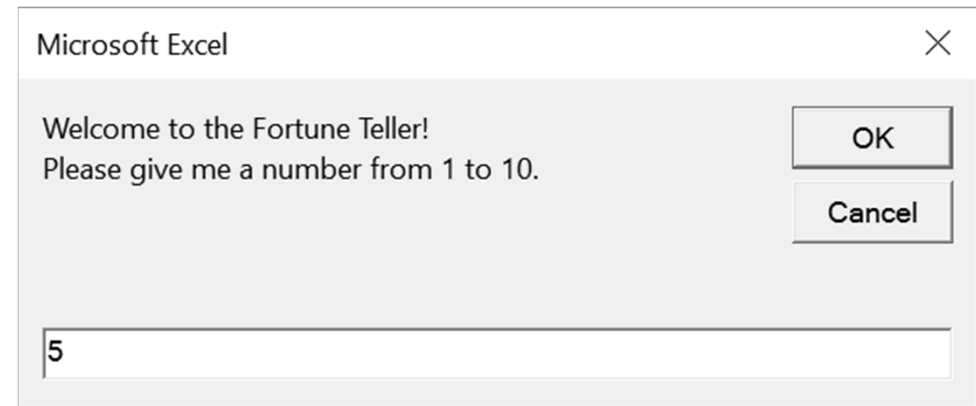
- The result is more concise and less cumbersome than using a nested If statement inside Else

Rewriting the Fortune Teller Logic

- Replacing the nested Ifs with ElseIf in the fortune teller logic gives you the following code:

```
If Number < 3 Then
    MsgBox "You will get rich!"
ElseIf Number < 5 Then
    MsgBox "You will get married!"
ElseIf Number < 7 Then
    MsgBox "You will get A+!"
ElseIf Number < 9 Then
    MsgBox "You will be a CEO!"
Else
    MsgBox "You want too much."
End If
```

Running the Example 1/2



If Number < 3 ✗ Then

 MsgBox "You will get rich!"

ElseIf Number < 5 ✗ Then

 MsgBox "You will get married!"

ElseIf Number < 7 ✓ Then

 MsgBox "You will get A+!"

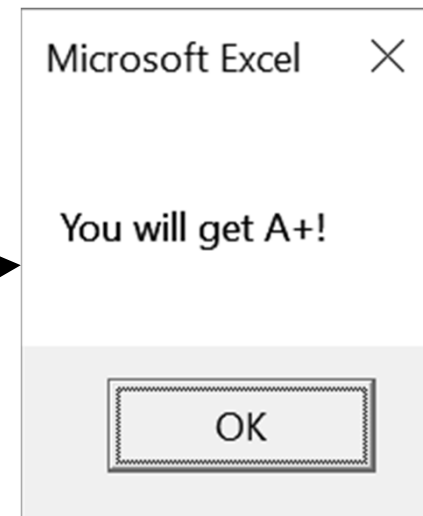
ElseIf Number < 9 Then

 MsgBox "You will be a CEO!"

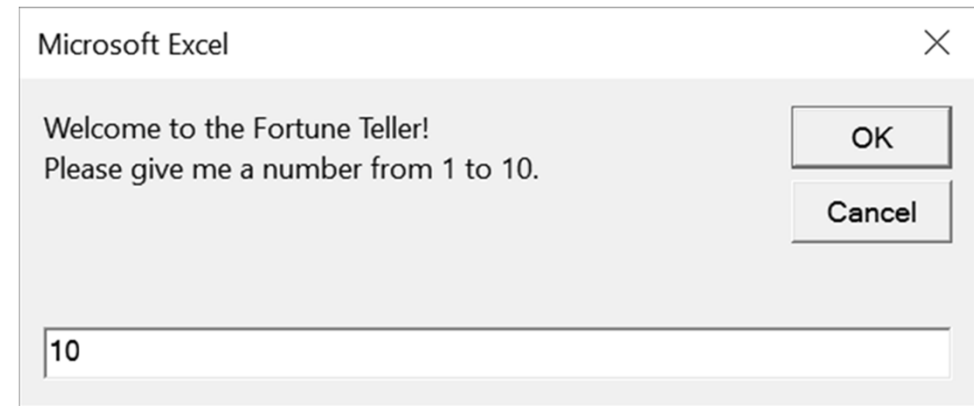
Else

 MsgBox "You want too much."

End If



Running the Example 2/2



If Number < 3 ✗ Then

 MsgBox "You will get rich!"

ElseIf Number < 5 ✗ Then

 MsgBox "You will get married!"

ElseIf Number < 7 ✗ Then

 MsgBox "You will get A+!"

ElseIf Number < 9 ✗ Then

 MsgBox "You will be a CEO!"

Else

 MsgBox "You want too much."

End If

