



VBA Certification

Q1 – 5 marks

You are an actuary working for the insurance company ZML Pty Ltd. It is approaching the time when you have to start completing valuations, and you decide to use VBA to help you do this. As a first step, you need to load the claims information relating to the 100 policyholders that ZML Pty Ltd. has insured on 31st December 2007.

You were unsure of how to approach this task, so you asked your supervisor for assistance. He wrote an algorithm for you in pseudocode, to illustrate how you would perform this task:

```
BEGIN CollectData
Set the counter to refer to the first individual
REPEAT
    Obtain information for individual 1
    Set the counter to refer to the next individual
UNTIL Counter is set on 100th individual
END
```

- a) What type of iteration structure is this an example of? (1 mark)
- b) Why is this type of structure referred to as an 'unguarded loop'? (2 marks)
- c) What is the danger of using this sort of iteration structure? (2 marks)

Q2 – 10 marks

Refer to the spreadsheet Week6Data.xls

You are working in the investments section of JJZ Ltd. and are considering an investment in a certain stock. It is assumed that the stock price follows the binomial model. Each day, the stock will either rise by 25% or fall by 20% with equal probability. The stock price today is \$100. You have generated 3 sets of 100 pseudorandom numbers, and will use them to simulate the stock price over the next 100 days.

If a random number is greater than or equal to 0.5, it is assumed that the stock price will rise, and if it is less than 0.5, it is assumed that the stock price will fall. For example, if the first four random numbers were 0.8, 0.6, 0.4, 0.5, then the stock price would rise to \$125 on the first day, rise to \$156.25 on the second day, fall to \$125 on the third day and rise to \$156.25 on the fourth day. The average of these five prices (including the starting price) is \$132.50

For each set of data, you want to consider the average stock price over the 100 day period (an average of 101 numbers) by filling in the red cells on the spreadsheet. Further, you want to consider the average of these three averages. If this final number is greater than \$100, then you will invest in the stock.

- a) Late one night, you complete the simulation in VBA by modifying the cells of the spreadsheet with `ActiveSheet.Cells()`. The following morning, you wake up in front of your computer screen with several sections of code missing.
Fill in the missing sections of code: (2 marks each; 6 marks in total)

```
Sub stockprice()  
Dim i As Integer  
Dim j As Integer  
Sheets("Sheet1").Select  
For i = 1 To 3  
    For j = 1 To 100  
        If ActiveSheet.Cells(*).Value >= 0.5 Then                (i)  
            (*)                                                    (ii)  
        Else  
            (*)                                                    (iii)  
        End If  
    Next j  
Next i  
End Sub
```

- b) Once you finish filling in the blanks in the code, you immediately notice that you've neglected to follow one of the Generally Accepted Programming Practices that you learned about in the ASOC VBA course you undertook while at university.

How would you modify your code to address this problem? (1 mark)

- c) Now that you've simulated the stock prices, you want to consider the average of these simulated stock prices. You decide to store the averages of the three columns of stock prices in the cells C103, F103 and I103. (3 marks in total)
- i. What EXCEL formula would you enter into cell C103 to calculate the average of the 101 stock prices in column C? (1 mark)
 - ii. How can you use an EXCEL formula to calculate the average of the three columns without previously storing the individual column averages in cells? (1 mark)
 - iii. Will you invest in the stock? (1 mark)

If you require clarification on any part of this question, send an email to vba@asoc.unsw.edu.au

If the question is unclear in any way, the relevant sections will be rewritten to clarify those points.

The required answers will not change.