(Part II) Solutions Lab-session 8

1)
```
Sub Determinant()
    Dim MA As Variant
    MA = Range("A11:C13").Value
    det = MA(1, 1) * (MA(2, 2) * MA(3, 3) - MA(2, 3) * MA(3, 2))
    det = det - MA(1, 2) * (MA(2, 1) * MA(3, 3) - MA(3, 1) * MA(2, 3))
    det = det + MA(1, 3) * (MA(2, 1) * MA(3, 2) - MA(2, 2) * MA(3, 1))
    Range("A15").Value = "Det A:"
    Range("B15").Value = det
    MsgBox ("The determinant of A is:" & det)
End Sub
```

2)
```
Sub Transpose()
    Dim MA As Variant
    Dim MB(1 To 3, 1 To 3)
    MA = Range("A11:C13").Value
    For i = 1 To 3
        For j = 1 To 3
            MB(i, j) = MA(j, i)
        Next j
    Next i
    Range("A19").Value = "The transposed of the Matrix B:"
    Range("A20:C22").Value = MB
End Sub
```

3)
```
Sub MatrixMult()
    Dim MA, MB As Variant
    Dim MC(1 To 3, 1 To 3)
    MA = Range("A11:C13").Value
    MB = Range("E11:G13").Value
    For i = 1 To 3
        For j = 1 To 3
            MC(i, j) = MA(i, 1) * MB(1, j) + MA(i, 2) * MB(2, j) + MA(i, 3) * MB(3, j)
        Next j
    Next i
    Range("I11:K13").Value = MC
End Sub
```

$$A \cdot B = \begin{pmatrix} 53 & 18 & 52 \\ 103 & 49 & 187 \\ 96 & 45 & 113 \end{pmatrix}$$

4)
```
Sub Search()
    Dim MA As Variant
    MA = Range("A1:Z30").Value
    For i = 1 To 30
        For j = 1 To 26
            If MA(i, j) = "City" Then
                Range("A1").Value = "City is written in row " & i & " column " & j
                GoTo fin
            Else
                Range("A1").Value = "Can not find City on the worksheet."
            End If
        Next j
    Next i
fin:
End Sub
```