R PROGRAMMING

Tutorial 12

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Roll No: I081

```
> #Q1
> mat<-matrix(c(12,6,9,15,13,5,19,22,6,3,2,20),nrow = 2,byrow = TRUE)
> print(mat)
     [,1] [,2] [,3] [,4] [,5] [,6]
[1,]   12    6    9   15   13    5
[2,]   19   22    6    3    2   20
> n = 6
> avg1 = sum(mat[1,])/n
> avg2 = sum(mat[2,])/n
> print(avg1)
[1] 10
> print(avg2)
[1] 12
> A<-matrix(c(mat[1,]-avg1,mat[2,]-avg2),nrow = 2,byrow = TRUE)
> print(A)
     [,1] [,2] [,3] [,4] [,5] [,6]
[1,]    2   -4   -1    5    3   -5
[2,]    7   10   -6   -9  -10    8
> S = A%*%t(A)
> print(S)
     [,1] [,2]
[1,]   80 -135
[2,] -135  430
> S = S/(n-1)
> print(S)
     [,1] [,2]
[1,]   16  -27
[2,]  -27   86
> e<-eigen(S)
> print(e$values)
[1] 95.204072  6.795928
> print(e$vectors)
           [,1]       [,2]
[1,] -0.3226591 -0.9465153
[2,]  0.9465153 -0.3226591
> print("First Component Analysis:")
[1] "First Component Analysis:"
> Z1 = e$vectors[1,]%*%mat

> Z1 = e$vectors[1,]%*%mat
> print(Z1)
          [,1]      [,2]      [,3]      [,4]      [,5]     [,6]
[1,] -21.8557 -22.75929 -8.583023 -7.679432 -6.087598 -20.5436
```