DB_Sept-21_1

Srijan Kundu

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```
library(ISLR)
```

Question 1:

(i)

```
A11 = diag(10)
A11
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]    1    0    0    0    0    0    0    0    0     0
##  [2,]    0    1    0    0    0    0    0    0    0     0
##  [3,]    0    0    1    0    0    0    0    0    0     0
##  [4,]    0    0    0    1    0    0    0    0    0     0
##  [5,]    0    0    0    0    1    0    0    0    0     0
##  [6,]    0    0    0    0    0    1    0    0    0     0
##  [7,]    0    0    0    0    0    0    1    0    0     0
##  [8,]    0    0    0    0    0    0    0    1    0     0
##  [9,]    0    0    0    0    0    0    0    0    1     0
## [10,]    0    0    0    0    0    0    0    0    0     1
```

(ii)

```
A12 = matrix(0, nrow = 4, ncol = 3)
A12
```

```
##      [,1] [,2] [,3]
## [1,]    0    0    0
## [2,]    0    0    0
## [3,]    0    0    0
## [4,]    0    0    0
```

(iii)

```
A13 = matrix(c(1:18), nrow = 3, byrow = TRUE)
A13
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6]
## [1,]    1    2    3    4    5    6
## [2,]    7    8    9   10   11   12
## [3,]   13   14   15   16   17   18
```

Question 2:

```
data(Smarket)
```

(a)

```
dim(Smarket)
```

```
## [1] 1250    9
```

(b)

```
Smarket[2, ]
```

```
##   Year  Lag1  Lag2   Lag3   Lag4   Lag5 Volume Today Direction
## 2 2001 0.959 0.381 -0.192 -2.624 -1.055 1.2965 1.032        Up
```

(c)

```
obs = Smarket$Lag3
```

(d)

```
A21 = matrix(c(Smarket[3, ], Smarket[4, ], Smarket[7, ], Smarket[9, ], Smarket[10, ]), nrow = 5, byrow =
A21
```

```
##      [,1] [,2]   [,3]   [,4]   [,5]   [,6]   [,7]   [,8]   [,9]
## [1,] 2001 1.032  0.959  0.381  -0.192 -2.624 1.4112 -0.623 Down
## [2,] 2001 -0.623 1.032  0.959  0.381  -0.192 1.276  0.614  Up
## [3,] 2001 1.392  0.213  0.614  -0.623 1.032  1.445  -0.403 Down
## [4,] 2001 0.027  -0.403 1.392  0.213  0.614  1.164  1.303  Up
## [5,] 2001 1.303  0.027  -0.403 1.392  0.213  1.2326 0.287  Up
```

```
A22 = as.matrix(Smarket[c(3,4,7,9,10), ])
A22
```

```
##    Year   Lag1     Lag2     Lag3     Lag4     Lag5     Volume   Today
## 3  "2001" " 1.032" " 0.959" " 0.381" "-0.192" "-2.624" "1.4112" "-0.623"
## 4  "2001" "-0.623" " 1.032" " 0.959" " 0.381" "-0.192" "1.2760" " 0.614"
## 7  "2001" " 1.392" " 0.213" " 0.614" "-0.623" " 1.032" "1.4450" "-0.403"
## 9  "2001" " 0.027" "-0.403" " 1.392" " 0.213" " 0.614" "1.1640" " 1.303"
## 10 "2001" " 1.303" " 0.027" "-0.403" " 1.392" " 0.213" "1.2326" " 0.287"
##    Direction
## 3  "Down"
## 4  "Up"
## 7  "Down"
## 9  "Up"
## 10 "Up"
```

Question 3:

```
V1 = rpois(16, 3)
V1
```

```
##  [1] 1 3 2 1 5 4 2 2 2 3 2 2 2 5 2 6
```

(a)

```
A31 = matrix(V1, nrow = 4, ncol = 4, byrow = TRUE)
A31
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    2    1
## [2,]    5    4    2    2
## [3,]    2    3    2    2
## [4,]    2    5    2    6
```

(b)

```
b1 = matrix(c(1,2,0,3), nrow = 4, ncol = 1, byrow = T)
b1
```

```
##      [,1]
## [1,]    1
## [2,]    2
## [3,]    0
## [4,]    3
```

```
b2 = c(1,2,0,3)
A31*b2
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    2    1
## [2,]   10    8    4    4
## [3,]    0    0    0    0
## [4,]    6   15    6   18
```

```
A31%*%b1
```

```
##      [,1]
## [1,]   10
## [2,]   19
## [3,]   14
## [4,]   30
```

(c)

```
I = diag(4)
A31*I
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    0    0    0
## [2,]    0    4    0    0
## [3,]    0    0    2    0
## [4,]    0    0    0    6
```

```
A31%*%I
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    2    1
## [2,]    5    4    2    2
## [3,]    2    3    2    2
## [4,]    2    5    2    6
```

(d)

```
solve(A31)
```

```
##      [,1] [,2]  [,3]  [,4]
## [1,] -0.4  0.2  0.30 -0.10
## [2,]  1.2  0.4 -1.90  0.30
## [3,] -0.8 -0.6  2.35 -0.45
## [4,] -0.6 -0.2  0.70  0.10
```