Matrislerle basit islemler

Vectorlerden Matris Olusturma

```
#Farklı yontemlerle matrix olusturma

v1 <- c(3,4,6,8,5)
v2 <- c(4,8,4,7,1)
v3 <- c(2,2,5,4,6)
v4 <- c(4,7,5,2,5)

cbind(v1,v2,v3,v4)
```

```
##      v1 v2 v3 v4
## [1,]  3  4  2  4
## [2,]  4  8  2  7
## [3,]  6  4  5  5
## [4,]  8  7  4  2
## [5,]  5  1  6  5
```

```
matrix(1:9, nrow = 3, ncol = 3)
```

```
##      [,1] [,2] [,3]
## [1,]    1    4    7
```

```
## [2,]    2    5    8
## [3,]    3    6    9
```

```
matrix(1:9, nrow = 3, ncol = 3, byrow = TRUE)
```

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

```
matrix(c(1,2,3,11,22,33), nrow = 2, ncol = 3)
```

```
##      [,1] [,2] [,3]
## [1,]    1    3   22
## [2,]    2   11   33
```

```
matrix(c(1,2,3,11,22,33,111,222,333), 3, 3)
```

```
##      [,1] [,2] [,3]
## [1,]    1   11  111
## [2,]    2   22  222
## [3,]    3   33  333
```

Matris Boyutları ve Frekans Tablosu

```
m <- matrix(c(1,2,3,11,22,33,111,222,333), 3, 3)

dim(m)
```

```
## [1] 3 3
```

```
m <- matrix(rep(3:5, 3), 3, 3)

table(m)
```

```
## m
## 3 4 5
## 3 3 3
```

Matris Eleman Secimi

```
MA <- rnorm(16)

MA <- matrix(MA, 4, 4)

MB <- rnorm(16,90,10)

MB <- matrix(MB, 4, 4)

cbind(MA,MB)
```

```
##            [,1]      [,2]       [,3]       [,4]     [,5]      [,6]      [,7]
## [1,] -0.8576127 1.7851702 -0.9721130  1.0503095 96.46194  88.70440  87.01729
## [2,] -0.1579299 0.1588572  0.4716849 -1.7850527 83.74522 103.63648 108.18611
## [3,]  0.9842454 0.2537778  0.6041885 -1.4422951 92.71078  98.69635  64.30515
## [4,]  0.7810001 1.5303623  0.9036478 -0.9252162 78.99812  96.21253  91.80516
##           [,8]
## [1,]  85.04823
## [2,] 100.78249
## [3,] 100.36154
## [4,]  79.91936
```

```
cbind(MA[1:2,1:2],MB[3:4,3:4])
```

```
##            [,1]      [,2]     [,3]      [,4]
## [1,] -0.8576127 1.7851702 64.30515 100.36154
## [2,] -0.1579299 0.1588572 91.80516  79.91936
```

Matris Isimlendirme

```
v1 <- c(3,4,6,8,5)
v2 <- c(4,8,4,7,1)
v3 <- c(2,2,5,4,6)
v4 <- c(4,7,5,2,5)

v <- cbind(v1,v2,v3,v4)

colnames(v) <- c("bir", "iki", "uc", "dort")

rownames(v) <- c("bir", "iki", "uc", "dort", "bes")


m <- matrix(1:10000, ncol = 5, nrow = 500)



rownames(m) <- c(paste("person", 1:500, sep = "_" ))



m2 <- matrix(1:1000, 20, 10)


# her kolona kolonun ortalamasını isim olarak atama

colnames(m2) <- as.character(round(sqrt(apply(m2, 2, mean))))
```

Lineer Cebir İslemleri

```
A <- matrix(1:9, 3, 3)

diag(A)  # kosegen elemanlari
```

```
## [1] 1 5 9
```

```
t(A)  #transpozu
```

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

```
det(matrix(c(0,1,1,1), nrow = 2))  #determinant
```

```
## [1] -1
```

```
A %*% A  #matris carpimi
```

```
##      [,1] [,2] [,3]
## [1,]   30   66  102
## [2,]   36   81  126
## [3,]   42   96  150
```

```
A * A #skaler caprim
```

```
##      [,1] [,2] [,3]
## [1,]    1   16   49
```

```
## [2,]    4   25   64
## [3,]    9   36   81
```

```
solve(matrix(c(3,4,5,8), 2, 2)) #tersini alma
```

```
##      [,1]  [,2]
## [1,]    2 -1.25
## [2,]   -1  0.75
```

Matris Formunda regresyon

```
library(readr)

hsb <- read_table2("hsb.txt")
```

```
## Warning: Missing column names filled in: 'X11' [11]
```

```
## Parsed with column specification:
## cols(
##   female = col_double(),
##   race = col_double(),
##   ses = col_double(),
##   schtyp = col_double(),
##   prog = col_double(),
##   read = col_double(),
##   write = col_double(),
##   math = col_double(),
##   science = col_double(),
##   socst = col_double(),
##   X11 = col_double()
## )
```

```
## Warning: 200 parsing failures.
## row col   expected     actual      file
##   1  -- 11 columns 12 columns 'hsb.txt'
##   2  -- 11 columns 12 columns 'hsb.txt'
##   3  -- 11 columns 12 columns 'hsb.txt'
##   4  -- 11 columns 12 columns 'hsb.txt'
##   5  -- 11 columns 12 columns 'hsb.txt'
## ... ... .......... .......... .........
## See problems(...) for more details.
```

```
hsb <- na.omit(hsb)  #eksik ozlem gordugunde satiri siler


y <- matrix(hsb$write, ncol = 1)

y
```

```
##       [,1]
##  [1,]   57
##  [2,]   68
##  [3,]   44
##  [4,]   63
##  [5,]   47
##  [6,]   44
##  [7,]   50
##  [8,]   34
##  [9,]   63
## [10,]   57
## [11,]   60
## [12,]   57
## [13,]   73
## [14,]   54
## [15,]   45
## [16,]   42
## [17,]   47
```

```
##  [18,]   57
##  [19,]   68
##  [20,]   55
##  [21,]   63
##  [22,]   63
##  [23,]   50
##  [24,]   60
##  [25,]   37
##  [26,]   34
##  [27,]   65
##  [28,]   47
##  [29,]   44
##  [30,]   52
##  [31,]   42
##  [32,]   76
##  [33,]   65
##  [34,]   42
##  [35,]   52
##  [36,]   60
##  [37,]   68
##  [38,]   65
##  [39,]   47
##  [40,]   39
##  [41,]   47
##  [42,]   55
##  [43,]   52
##  [44,]   42
##  [45,]   65
##  [46,]   55
##  [47,]   50
##  [48,]   65
##  [49,]   47
##  [50,]   57
##  [51,]   53
##  [52,]   39
##  [53,]   44
##  [54,]   63
```

```
##  [55,]   73
##  [56,]   39
##  [57,]   37
##  [58,]   42
##  [59,]   63
##  [60,]   48
##  [61,]   50
##  [62,]   47
##  [63,]   44
##  [64,]   34
##  [65,]   50
##  [66,]   44
##  [67,]   60
##  [68,]   47
##  [69,]   63
##  [70,]   50
##  [71,]   44
##  [72,]   60
##  [73,]   73
##  [74,]   68
##  [75,]   55
##  [76,]   47
##  [77,]   55
##  [78,]   68
##  [79,]   31
##  [80,]   47
##  [81,]   63
##  [82,]   36
##  [83,]   68
##  [84,]   63
##  [85,]   55
##  [86,]   55
##  [87,]   52
##  [88,]   34
##  [89,]   50
##  [90,]   55
##  [91,]   52
```

```
##  [92,]   63
##  [93,]   68
##  [94,]   39
##  [95,]   44
##  [96,]   50
##  [97,]   71
##  [98,]   63
##  [99,]   34
## [100,]   63
## [101,]   68
## [102,]   47
## [103,]   47
## [104,]   63
## [105,]   52
## [106,]   55
## [107,]   60
## [108,]   35
## [109,]   47
## [110,]   71
## [111,]   57
## [112,]   44
## [113,]   65
## [114,]   68
## [115,]   73
## [116,]   36
## [117,]   43
## [118,]   73
## [119,]   52
## [120,]   41
## [121,]   60
## [122,]   50
## [123,]   50
## [124,]   47
## [125,]   47
## [126,]   55
## [127,]   50
## [128,]   39
```

```
## [129,]   50
## [130,]   34
## [131,]   57
## [132,]   57
## [133,]   68
## [134,]   42
## [135,]   61
## [136,]   76
## [137,]   47
## [138,]   46
## [139,]   39
## [140,]   52
## [141,]   28
## [142,]   42
## [143,]   47
## [144,]   47
## [145,]   52
## [146,]   47
## [147,]   50
## [148,]   44
## [149,]   47
## [150,]   45
## [151,]   47
## [152,]   65
## [153,]   43
## [154,]   47
## [155,]   57
## [156,]   68
## [157,]   52
## [158,]   42
## [159,]   42
## [160,]   66
## [161,]   47
## [162,]   57
## [163,]   47
## [164,]   57
## [165,]   52
```

```
## [166,]   44
## [167,]   50
## [168,]   39
## [169,]   57
## [170,]   57
## [171,]   42
## [172,]   47
## [173,]   42
## [174,]   60
## [175,]   44
## [176,]   63
## [177,]   65
## [178,]   39
## [179,]   50
## [180,]   52
## [181,]   60
## [182,]   44
## [183,]   52
## [184,]   55
## [185,]   50
## [186,]   65
## [187,]   52
## [188,]   47
## [189,]   63
## [190,]   50
## [191,]   42
## [192,]   36
## [193,]   50
## [194,]   41
## [195,]   47
## [196,]   55
## [197,]   42
## [198,]   57
## [199,]   55
## [200,]   63
```

```r
#  $ isareti icindeki degiskenlere erisimi saglar


x <- as.matrix(cbind(hsb$math, hsb$science, hsb$socst, hsb$female))



n <- nrow(x)  #row sayisi

p <- ncol(x)  # col sayisi


solve(t(x) %*% x ) %*% t(x) %*% y
```

```
##             [,1]
## [1,]  0.26824903
## [2,]  0.41010461
## [3,]  0.33901939
## [4,] -0.01192999
```

```r
# r kendi regresyon islemi

summary(lm(write ~ math + science + socst + female, hsb))
```

```
##
## Call:
## lm(formula = write ~ math + science + socst + female, data = hsb)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -17.9931  -4.6542   0.3242   4.2075  15.7945
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)  4.37005    3.20272   1.364  0.17399
## math         0.23719    0.06956   3.410  0.00079 ***
## science      0.38063    0.07451   5.108 7.71e-07 ***
## socst        0.31828    0.06942   4.585 8.10e-06 ***
## female      -0.01193    0.00904  -1.320  0.18847
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.988 on 195 degrees of freedom
## Multiple R-squared:  0.5449, Adjusted R-squared:  0.5355
## F-statistic: 58.36 on 4 and 195 DF,  p-value: < 2.2e-16
```