# DaigleWk3D3Lab.R

*2011home*

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```
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## Wk3D3

# Exercise 1
# Construct the matrices
a <- 1:9
A <- matrix(a**2,3,3, byrow = TRUE)
A
```

```
##      [,1] [,2] [,3]
## [1,]    1    4    9
## [2,]   16   25   36
## [3,]   49   64   81
```

```
At <- matrix(a**2,3,3)
At
```

```
##      [,1] [,2] [,3]
## [1,]    1   16   49
## [2,]    4   25   64
## [3,]    9   36   81
```

```
# Exercise 2
Storrs <- c(365, 489)
Hartford <-  c(426, 387)
Stamford <- c(571, 486)

HP_vector <- c(Storrs, Hartford, Stamford)
HP_vector
```

```
## [1] 365 489 426 387 571 486
```

```
HP_matrix <- matrix(HP_vector, 3, 2, TRUE)
type <- c("House", "Condo")
colnames(HP_matrix) <- type
Area <- c("Storrs", "Hartford", "Stamford")
rownames(HP_matrix) <- Area
HP_matrix
```

```
##          House Condo
## Storrs     365   489
## Hartford   426   387
## Stamford   571   486
```

```
CT_average <- colMeans(HP_matrix)
# CT_av <- c(mean(HP_matrix[,1]),mean(HP_matrix[,2])) Creating a vector of column mea
ns by column selection
HP_matrix.2 <- rbind(HP_matrix,CT_average)
HP_matrix.2
```

```
##            House Condo
## Storrs       365   489
## Hartford     426   387
## Stamford     571   486
## CT_average   454   454
```

```
HC_av <- rowMeans(HP_matrix.2)
HP_matrix.f <- cbind(HP_matrix.2,HC_av)
HP_matrix.f
```

```
##            House Condo HC_av
## Storrs       365   489 427.0
## Hartford     426   387 406.5
## Stamford     571   486 528.5
## CT_average   454   454 454.0
```

```
## Exercise 3
set.seed(1)
Income <- rchisq(100,5)

yrsOfEdu <- sample(7:16,100,TRUE)

CT <- cbind(Income,yrsOfEdu)
CT
```

```
##            Income yrsOfEdu
##   [1,]  2.4243432        8
##   [2,]  8.6454233       11
##   [3,]  8.4085118       16
##   [4,]  5.2587468       14
##   [5,] 10.5785936       16
##   [6,]  6.3608593       11
##   [7,]  5.7943177       13
##   [8,]  3.1828622       11
##   [9,]  2.0592685        8
##  [10,]  2.4358362        9
##  [11,]  3.1984567       11
##  [12,]  3.8739181       10
##  [13,]  1.8750277       16
##  [14,]  6.6599664       12
##  [15,]  5.8561660       10
##  [16,]  7.0215202        9
##  [17,]  6.5180841       14
##  [18,]  4.2136816       14
##  [19,]  0.3520238        8
##  [20,]  5.5512289        7
##  [21,]  7.6604671       14
##  [22,]  2.2843960       13
##  [23,]  2.7619012        8
##  [24,]  3.3611000        7
##  [25,]  3.7145551        8
##  [26,]  2.3739235       10
##  [27,]  1.0532339        8
##  [28,]  7.2984444        9
##  [29,]  2.8773942        8
##  [30,]  7.7163695        9
##  [31,]  6.4498056        8
##  [32,]  3.5481910       11
##  [33,]  2.8218402       14
##  [34,]  5.7294182        7
##  [35,]  2.2890969       12
##  [36,]  0.7996636       15
##  [37,]  6.4690608       10
##  [38,]  3.6885478        7
##  [39,]  4.7881647        8
##  [40,]  3.0054763       10
##  [41,]  5.0230135        8
##  [42,]  1.4434093        8
##  [43,]  4.7387918        9
##  [44,]  5.9397685        9
##  [45,]  3.5266464        8
##  [46,]  5.7737007       16
```

```
##  [47,]  3.6271278       10
##  [48,]  3.9688197       12
##  [49,]  6.1887477       13
##  [50,]  4.0795941        7
##  [51,]  2.1739334        8
##  [52,]  0.9846658        7
##  [53,]  9.2191406       16
##  [54,]  4.4452092       13
##  [55,] 12.5051945        7
##  [56,]  5.4579987       11
##  [57,]  2.2439802       11
##  [58,]  3.6700404       10
##  [59,]  1.2399876       16
##  [60,]  4.4169823        8
##  [61,]  3.6738755       15
##  [62,]  4.2130323        7
##  [63,]  2.5063504       11
##  [64,]  8.3334449        8
##  [65,]  6.4820497        8
##  [66,]  3.4032096       15
##  [67,]  5.8563195       14
##  [68,]  4.9971538        9
##  [69,]  7.5719910       11
##  [70,]  3.1859019        7
##  [71,]  6.0381653       10
##  [72,]  8.5191164       16
##  [73,]  1.9113351       13
##  [74,]  7.9553813       13
##  [75,]  6.2256529       10
##  [76,]  9.7472630       11
##  [77,]  5.7355917       16
##  [78,]  1.2040958       15
##  [79,]  4.6739902       16
##  [80,]  7.3152018       15
##  [81,]  6.5170836       14
##  [82,]  2.1046349        9
##  [83,]  1.8384136       14
##  [84,]  1.4416722       16
##  [85,] 10.5602954        9
##  [86,]  6.2839897       10
##  [87,]  6.9885700       15
##  [88,]  5.1604395        7
##  [89,] 10.1727706       10
##  [90,]  2.4039462       11
##  [91,]  4.0721157        8
##  [92,]  4.0780894       12
##  [93,]  0.6592326       16
```

```
##  [94,]  2.9661204       16
##  [95,]  5.0055883        8
##  [96,]  5.5219052       12
##  [97,]  4.4000013       10
##  [98,]  3.6710612       13
##  [99,]  8.7005641        9
## [100,]  3.4160999       11
```

```
gender <- sample(c("Male","Female"),100,TRUE)

Female <- c(gender=="Female")
CT1 <- CT*Female
CT1
```

```
##            Income yrsOfEdu
##   [1,]  0.0000000        0
##   [2,]  0.0000000        0
##   [3,]  8.4085118       16
##   [4,]  0.0000000        0
##   [5,]  0.0000000        0
##   [6,]  6.3608593       11
##   [7,]  0.0000000        0
##   [8,]  3.1828622       11
##   [9,]  0.0000000        0
##  [10,]  2.4358362        9
##  [11,]  0.0000000        0
##  [12,]  3.8739181       10
##  [13,]  0.0000000        0
##  [14,]  0.0000000        0
##  [15,]  0.0000000        0
##  [16,]  7.0215202        9
##  [17,]  0.0000000        0
##  [18,]  4.2136816       14
##  [19,]  0.3520238        8
##  [20,]  0.0000000        0
##  [21,]  7.6604671       14
##  [22,]  2.2843960       13
##  [23,]  0.0000000        0
##  [24,]  0.0000000        0
##  [25,]  3.7145551        8
##  [26,]  2.3739235       10
##  [27,]  0.0000000        0
##  [28,]  0.0000000        0
##  [29,]  0.0000000        0
##  [30,]  0.0000000        0
##  [31,]  6.4498056        8
```

```
##  [32,]  0.0000000        0
##  [33,]  0.0000000        0
##  [34,]  0.0000000        0
##  [35,]  2.2890969       12
##  [36,]  0.7996636       15
##  [37,]  6.4690608       10
##  [38,]  0.0000000        0
##  [39,]  0.0000000        0
##  [40,]  3.0054763       10
##  [41,]  5.0230135        8
##  [42,]  0.0000000        0
##  [43,]  4.7387918        9
##  [44,]  0.0000000        0
##  [45,]  0.0000000        0
##  [46,]  5.7737007       16
##  [47,]  3.6271278       10
##  [48,]  0.0000000        0
##  [49,]  0.0000000        0
##  [50,]  4.0795941        7
##  [51,]  0.0000000        0
##  [52,]  0.0000000        0
##  [53,]  0.0000000        0
##  [54,]  4.4452092       13
##  [55,]  0.0000000        0
##  [56,]  5.4579987       11
##  [57,]  2.2439802       11
##  [58,]  3.6700404       10
##  [59,]  1.2399876       16
##  [60,]  0.0000000        0
##  [61,]  3.6738755       15
##  [62,]  0.0000000        0
##  [63,]  2.5063504       11
##  [64,]  8.3334449        8
##  [65,]  0.0000000        0
##  [66,]  3.4032096       15
##  [67,]  5.8563195       14
##  [68,]  4.9971538        9
##  [69,]  0.0000000        0
##  [70,]  0.0000000        0
##  [71,]  0.0000000        0
##  [72,]  8.5191164       16
##  [73,]  1.9113351       13
##  [74,]  0.0000000        0
##  [75,]  6.2256529       10
##  [76,]  9.7472630       11
##  [77,]  0.0000000        0
##  [78,]  0.0000000        0
```

```
##  [79,]  0.0000000        0
##  [80,]  0.0000000        0
##  [81,]  6.5170836       14
##  [82,]  2.1046349        9
##  [83,]  1.8384136       14
##  [84,]  1.4416722       16
##  [85,]  0.0000000        0
##  [86,]  0.0000000        0
##  [87,]  6.9885700       15
##  [88,]  0.0000000        0
##  [89,] 10.1727706       10
##  [90,]  2.4039462       11
##  [91,]  0.0000000        0
##  [92,]  0.0000000        0
##  [93,]  0.6592326       16
##  [94,]  0.0000000        0
##  [95,]  0.0000000        0
##  [96,]  5.5219052       12
##  [97,]  4.4000013       10
##  [98,]  0.0000000        0
##  [99,]  0.0000000        0
## [100,]  0.0000000        0
```

```
high_Ed <- yrsOfEdu>12
CT2 <- CT*high_Ed
CT2
```

```
##            Income yrsOfEdu
##   [1,]  0.0000000        0
##   [2,]  0.0000000        0
##   [3,]  8.4085118       16
##   [4,]  5.2587468       14
##   [5,] 10.5785936       16
##   [6,]  0.0000000        0
##   [7,]  5.7943177       13
##   [8,]  0.0000000        0
##   [9,]  0.0000000        0
##  [10,]  0.0000000        0
##  [11,]  0.0000000        0
##  [12,]  0.0000000        0
##  [13,]  1.8750277       16
##  [14,]  0.0000000        0
##  [15,]  0.0000000        0
##  [16,]  0.0000000        0
##  [17,]  6.5180841       14
##  [18,]  4.2136816       14
```

```
##  [19,]  0.0000000        0
##  [20,]  0.0000000        0
##  [21,]  7.6604671       14
##  [22,]  2.2843960       13
##  [23,]  0.0000000        0
##  [24,]  0.0000000        0
##  [25,]  0.0000000        0
##  [26,]  0.0000000        0
##  [27,]  0.0000000        0
##  [28,]  0.0000000        0
##  [29,]  0.0000000        0
##  [30,]  0.0000000        0
##  [31,]  0.0000000        0
##  [32,]  0.0000000        0
##  [33,]  2.8218402       14
##  [34,]  0.0000000        0
##  [35,]  0.0000000        0
##  [36,]  0.7996636       15
##  [37,]  0.0000000        0
##  [38,]  0.0000000        0
##  [39,]  0.0000000        0
##  [40,]  0.0000000        0
##  [41,]  0.0000000        0
##  [42,]  0.0000000        0
##  [43,]  0.0000000        0
##  [44,]  0.0000000        0
##  [45,]  0.0000000        0
##  [46,]  5.7737007       16
##  [47,]  0.0000000        0
##  [48,]  0.0000000        0
##  [49,]  6.1887477       13
##  [50,]  0.0000000        0
##  [51,]  0.0000000        0
##  [52,]  0.0000000        0
##  [53,]  9.2191406       16
##  [54,]  4.4452092       13
##  [55,]  0.0000000        0
##  [56,]  0.0000000        0
##  [57,]  0.0000000        0
##  [58,]  0.0000000        0
##  [59,]  1.2399876       16
##  [60,]  0.0000000        0
##  [61,]  3.6738755       15
##  [62,]  0.0000000        0
##  [63,]  0.0000000        0
##  [64,]  0.0000000        0
##  [65,]  0.0000000        0
```

```
##  [66,]  3.4032096       15
##  [67,]  5.8563195       14
##  [68,]  0.0000000        0
##  [69,]  0.0000000        0
##  [70,]  0.0000000        0
##  [71,]  0.0000000        0
##  [72,]  8.5191164       16
##  [73,]  1.9113351       13
##  [74,]  7.9553813       13
##  [75,]  0.0000000        0
##  [76,]  0.0000000        0
##  [77,]  5.7355917       16
##  [78,]  1.2040958       15
##  [79,]  4.6739902       16
##  [80,]  7.3152018       15
##  [81,]  6.5170836       14
##  [82,]  0.0000000        0
##  [83,]  1.8384136       14
##  [84,]  1.4416722       16
##  [85,]  0.0000000        0
##  [86,]  0.0000000        0
##  [87,]  6.9885700       15
##  [88,]  0.0000000        0
##  [89,]  0.0000000        0
##  [90,]  0.0000000        0
##  [91,]  0.0000000        0
##  [92,]  0.0000000        0
##  [93,]  0.6592326       16
##  [94,]  2.9661204       16
##  [95,]  0.0000000        0
##  [96,]  0.0000000        0
##  [97,]  0.0000000        0
##  [98,]  3.6710612       13
##  [99,]  0.0000000        0
## [100,]  0.0000000        0
```

```
av_Female_Inc <- mean(CT1[,1])
av_HighEd_Inc <- mean(CT2[,1])
exp_Inc <- c(av_Female_Inc, av_HighEd_Inc)
names(exp_Inc) <- c("av_Female_Inc", "av_HighEd_Inc")
exp_Inc
```

```
## av_Female_Inc av_HighEd_Inc
##      2.084171      1.574104
```