Exercise-1.R

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### Exercise 1  
  
remove(list = ls())  
  
A = matrix(c(13,-4,2,-4,13,-2,2,-2,10),3,3)  
  
# a) Correlation matrix C  
  
C = cov2cor(A)  
C

## [,1] [,2] [,3]  
## [1,] 1.0000000 -0.3076923 0.1754116  
## [2,] -0.3076923 1.0000000 -0.1754116  
## [3,] 0.1754116 -0.1754116 1.0000000

# b)  
  
CE = eigen(C)  
CE

## eigen() decomposition  
## $values  
## [1] 1.4457487 0.8619436 0.6923077  
##   
## $vectors  
## [,1] [,2] [,3]  
## [1,] 0.6178686 -0.3438582 7.071068e-01  
## [2,] -0.6178686 0.3438582 7.071068e-01  
## [3,] 0.4862889 0.8737981 -1.110223e-16

### Die Eigenwerte und die Eigenvektoren der Korrelationsmatrix sind nicht die gleichen, wie die der Kovarianzmatrix A