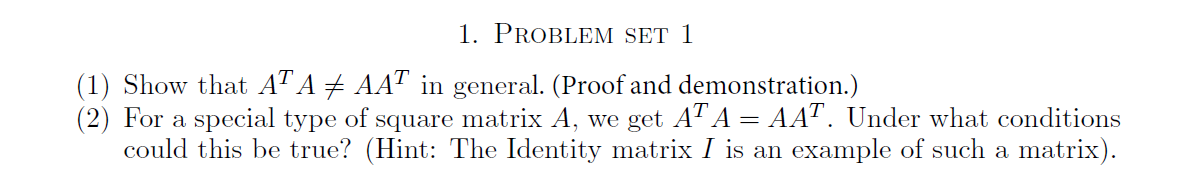
HMW 2-Problem Set 1

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### Question 1 :

A = matrix(seq(1, 9), nrow=3, byrow = T)  
AT = matrix(seq(1, 9), nrow=3, byrow = F)

A %\*% AT

## [,1] [,2] [,3]  
## [1,] 14 32 50  
## [2,] 32 77 122  
## [3,] 50 122 194

AT %\*% A

## [,1] [,2] [,3]  
## [1,] 66 78 90  
## [2,] 78 93 108  
## [3,] 90 108 126

(AT %\*% A) == (A %\*% AT)

## [,1] [,2] [,3]  
## [1,] FALSE FALSE FALSE  
## [2,] FALSE FALSE FALSE  
## [3,] FALSE FALSE FALSE

### Question 2 :

is true if is a diagonal matrix.So An identity matrix when transposed and multiplied to itself, are equal to each other.

Let then therefore:

This gives a case when is true.

A = matrix(c(1, 0, 0, 1), nrow=2, byrow = T)  
AT = t(A)  
(A %\*% AT) == (A %\*% AT)

## [,1] [,2]  
## [1,] TRUE TRUE  
## [2,] TRUE TRUE