Simple R Functions

January 26, 2018

1

a

A= matrix(c(1,1,3,5,2,6,-2,-1,-3), nrow=3, ncol=3, byrow=TRUE) A A %% *A* %% A #b A[,3] <- c(A[,2]+A[,3]) A

2

B= matrix(rep(c(10,-10,10),length=45), nrow=15, ncol=3, byrow=TRUE) B crossprod(B)

3

matE <- matrix(rep(0,length=36), nrow=6, ncol=6, byrow=FALSE) matE[row(matE)==col(matE)-1] <- 1 matE[row(matE)==col(matE)+1] <- 1 matE

4

outer(c(0,1,2,3,4),c(0,1,2,3,4),'+')

5

a

outer(c(0,1,2,3,4),c(0,1,2,3,4),'+')%%5 #b outer(c(0,1,2,3,4,5,6,7,8,9),c(0,1,2,3,4,5,6,7,8,9),'+')%%10 #c outer(c(0,1,2,3,4,5,6,7,8),c(9,8,7,6,5,4,3,2,1),'+')%%9

6

BS6 <- matrix(0,ncol=5,nrow=5) BS6 <- 1+ abs(col(BS6)-row(BS6)) solve(BS6,matrix(c(7,-1,-3,5,17),ncol=1))

7

set.seed(75) aMat <- matrix(sample(10, size=60, replace=T), nr=6) aMat #a aMata <- aMat>4 A7 <-aMata %*% c(1,1,1,1,1,1,1,1,1,1) A7 #b row(A7)[A7==2] #c aMatc <- colSums(aMat) aMatc <- outer(aMatc,aMatc,'+')>75 matrix(c(row(aMatc)[aMatc=='TRUE'],col(aMatc)[aMatc=='TRUE']),ncol=2)

8

a

$\sum_{i=1}^{20}\sum_{j=1}^{5}\frac{i^4}{3+j}$ sum(outer((1:20)$^{4,4:8,\text{“/”}))$ #b $\sum_{i=1}^{20}\sum_{j=1}^{5}\frac{i^4}{3+ij}$ sum((1:20)$4/(3+$outer(1:20,1:5,“*“))) #c
$\sum_{i=1}^{10}\sum_{j=1}^{i}\frac{i^4}{3+ij}$ sum(outer(1:10,1:10,function(i,j){ (i>=j)*i^4/(3+*ij) }))