**Problem Set 1**

**R for Probability Matrices**

1. > library(expm)

> mat1<-matrix(c(1,2,3,4),2,byrow = T)

> mat2<-matrix(c(5,6,7,8),2,byrow = T)

> matresults=mat1%\*%mat2

> matresults

[,1] [,2]

[1,] 19 22

[2,] 43 50

1. > library(expm)

> mat1<-matrix(c(.5,.5,.25,.75),2,byrow = T)

> mat2<-matrix(c(.33,.67,.67,.33),2,byrow = T)

> matresults=mat1%\*%mat2

> matresults

[,1] [,2]

[1,] 0.500 0.500

[2,] 0.585 0.415

**3.**  > library(expm)

> mat1<-matrix(c(.5,.5,.25,.75),2,byrow = T)

> matresults=mat1%^%2

> matresults

[,1] [,2]

[1,] 0.3750 0.6250

[2,] 0.3125 0.6875

**4.** >

> library(expm)

> mat1<-matrix(c(.5,.5,.25,.75),2,byrow = T)

> matresults=mat1%^%3

> matresults

[,1] [,2]

[1,] 0.343750 0.656250

[2,] 0.328125 0.671875

**5.**

|  |
| --- |
| > library(expm)  > mat1<-matrix(c(.15,.85,.001,.999),2,byrow = T)  > mat2<-matrix(c(.02,.98,.19,.81),2,byrow = T)  > matresults=(mat1%^%4)+(mat2%^%7)  > matresults  [,1] [,2]  [1,] 0.1640571 1.835943  [2,] 0.1635683 1.836432 |
| |  | | --- | | > | |
|  |

**6.** >

> library(expm)

> mat1<-matrix(c(1,2),1,byrow = T)

> mat2<-matrix(c(5,6,7,8),2,byrow = T)

> matresults=mat1%\*%mat2

> matresults

[,1] [,2]

[1,] 19 22

>

**7.**

|  |
| --- |
| >  > library(expm)  > mat1<-matrix(c(.08,.92),1,byrow = T)  > mat2<-matrix(c(.375,.625,.399,.601),2,byrow = T)  > matresults=mat1%\*%mat2  > matresults  [,1] [,2]  [1,] 0.39708 0.60292 |
| |  | | --- | | > | |
|  |

**8.** >

> library(expm)

> mat1<-matrix(c(.08,.92),1,byrow = T)

> mat2<-matrix(c(.375,.625,.399,.601),2,byrow = T)

> matresults=mat1%\*%(mat2%^%2)

> matresults

[,1] [,2]

[1,] 0.3894701 0.6105299

>

**9.**  >

> library(expm)

> mat1<-matrix(c(.5,.5),1,byrow = T)

> mat2<-matrix(c(.5,.5,.5,.5),2,byrow = T)

> matresults=mat1%\*%(mat2%^%2)

> matresults

[,1] [,2]

[1,] 0.5 0.5

**10.** >

> library(expm)

> mat1<-matrix(c(.014,.986),1,byrow = T)

> mat2<-matrix(c(.135,.865,.501,.499),2,byrow = T)

> matresults=mat1%\*%(mat2%^%7)

> matresults

[,1] [,2]

[1,] 0.3670746 0.6329254

>