HW_01_Gupta_S

Sumit Gupta

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```
Sys.setenv(PATH=paste(Sys.getenv("PATH"),"C:/Program Files/MiKTeX
2.9/miktex/bin/x64/",sep=";"))
```

```
options(stringsAsFactors=F)
```

Question 1

a.

```
v1 <- c(2:6)
v1
```

```
## [1] 2 3 4 5 6
```

```
v2 <- c(5:9)
v2
```

```
## [1] 5 6 7 8 9
```

b.

```
v2-v1
```

```
## [1] 3 3 3 3 3
```

c.

```
v1 %*% v2
```

```
##      [,1]
## [1,]  150
```

d.

```
v3 <- ifelse(v1+v2>10, 0, v1)
```

Question 2

a.

```
m1 <- matrix(1:25, nrow = 5, ncol = 5)
m1
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    6   11   16   21
## [2,]    2    7   12   17   22
## [3,]    3    8   13   18   23
## [4,]    4    9   14   19   24
## [5,]    5   10   15   20   25
```

b.

```
m1%*%v1
```

```
##      [,1]
## [1,]  270
## [2,]  290
## [3,]  310
## [4,]  330
## [5,]  350
```

c.

```
v1%*%m1
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]   70  170  270  370  470
```

d.

```
m1%*%t(m1)
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]  855  910  965 1020 1075
## [2,]  910  970 1030 1090 1150
## [3,]  965 1030 1095 1160 1225
## [4,] 1020 1090 1160 1230 1300
## [5,] 1075 1150 1225 1300 1375
```

Question 3

a.

```
date <- sample(seq(as.Date('2000/01/01'), as.Date('2017/01/01'), by=1), 10)

char <- stringi::stri_rand_strings(10, 1)
numbers <- c(1:10)

dataframe <- data.frame(date, char, numbers)
```

b.

```
str(dataframe)
```

```
## 'data.frame':    10 obs. of  3 variables:
##  $ date   : Date, format: "2002-09-01" "2015-10-17" ...
##  $ char   : chr  "E" "S" "u" "w" ...
##  $ numbers: int  1 2 3 4 5 6 7 8 9 10
```

c.

```
write.csv(dataframe, file = "dataframe_output.csv",row.names=FALSE)
df_input <- read.csv("dataframe_output.csv", header = T, sep = ",")
```

d.

```
dataframe_1 <- dataframe[c(1,3,10),c(1,2)]
```

e.

```
dataframe$numbers <- ifelse(dataframe$numbers %%2==0, 0,dataframe$numbers)
dataframe
```

```
##          date char numbers
## 1  2002-09-01    E       1
## 2  2015-10-17    S       0
## 3  2014-08-05    u       3
## 4  2009-08-22    w       0
## 5  2015-11-28    Z       5
## 6  2000-04-10    K       0
## 7  2002-02-07    g       7
## 8  2000-08-06    w       0
## 9  2002-01-13    I       9
## 10 2007-03-05    4       0
```

f.

```
list <- list(v1=v1, v2=v2, m1=m1, dataframe=dataframe)
list[[3]][2]
```

```
## [1] 2
```

Question 4

a.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$