HW2\_key

G3-

# Question 1

v1<- seq(1,17, by=4)  
v1

[1] 1 5 9 13 17

# Question 2

## I)

A<- matrix(data= seq(20,39) , nrow = 4, ncol = 5, byrow = TRUE)  
A

[,1] [,2] [,3] [,4] [,5]  
[1,] 20 21 22 23 24  
[2,] 25 26 27 28 29  
[3,] 30 31 32 33 34  
[4,] 35 36 37 38 39

## II)

colnames(A) <- c('A','B','C','D','E')  
  
A

A B C D E  
[1,] 20 21 22 23 24  
[2,] 25 26 27 28 29  
[3,] 30 31 32 33 34  
[4,] 35 36 37 38 39

## III)

B<- A[c(2,4) , c(2,4) ]  
B

B D  
[1,] 26 28  
[2,] 36 38

## IV)

t(B)

[,1] [,2]  
B 26 36  
D 28 38

## V)

B\_inverse <- solve(B)  
B\_inverse

[,1] [,2]  
B -1.9 1.4  
D 1.8 -1.3

## VI)

B %\*% B\_inverse

[,1] [,2]  
[1,] 1 0  
[2,] 0 1

the name of the above matrix is identity matrix.

# Question 3

## I)

df <- mtcars  
head(df, 10)

mpg cyl disp hp drat wt qsec vs am gear carb  
Mazda RX4 21.0 6 160.0 110 3.90 2.620 16.46 0 1 4 4  
Mazda RX4 Wag 21.0 6 160.0 110 3.90 2.875 17.02 0 1 4 4  
Datsun 710 22.8 4 108.0 93 3.85 2.320 18.61 1 1 4 1  
Hornet 4 Drive 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1  
Hornet Sportabout 18.7 8 360.0 175 3.15 3.440 17.02 0 0 3 2  
Valiant 18.1 6 225.0 105 2.76 3.460 20.22 1 0 3 1  
Duster 360 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4  
Merc 240D 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2  
Merc 230 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2  
Merc 280 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4

## II)

df1<- df %>% select(cyl, hp, wt, vs, am ,gear , mpg) %>% arrange(cyl) %>% head(5)  
   
df1

cyl hp wt vs am gear mpg  
Datsun 710 4 93 2.320 1 1 4 22.8  
Merc 240D 4 62 3.190 1 0 4 24.4  
Merc 230 4 95 3.150 1 0 4 22.8  
Fiat 128 4 66 2.200 1 1 4 32.4  
Honda Civic 4 52 1.615 1 1 4 30.4

## III)

df1 <- mutate(df1, gpm= round(1/mpg, 3))  
head(df1, 5)

cyl hp wt vs am gear mpg gpm  
1 4 93 2.320 1 1 4 22.8 0.044  
2 4 62 3.190 1 0 4 24.4 0.041  
3 4 95 3.150 1 0 4 22.8 0.044  
4 4 66 2.200 1 1 4 32.4 0.031  
5 4 52 1.615 1 1 4 30.4 0.033

## IV)

str(df1)

## 'data.frame': 5 obs. of 8 variables:  
## $ cyl : num 4 4 4 4 4  
## $ hp : num 93 62 95 66 52  
## $ wt : num 2.32 3.19 3.15 2.2 1.61  
## $ vs : num 1 1 1 1 1  
## $ am : num 1 0 0 1 1  
## $ gear: num 4 4 4 4 4  
## $ mpg : num 22.8 24.4 22.8 32.4 30.4  
## $ gpm : num 0.044 0.041 0.044 0.031 0.033

## V)

df1$cyl <- factor(df1$cyl)  
df1$am <- factor(df1$am)  
df1$gear <- factor(df1$gear)  
df1$vs <- factor(df1$vs)  
  
str(df1)

## 'data.frame': 5 obs. of 8 variables:  
## $ cyl : Factor w/ 1 level "4": 1 1 1 1 1  
## $ hp : num 93 62 95 66 52  
## $ wt : num 2.32 3.19 3.15 2.2 1.61  
## $ vs : Factor w/ 1 level "1": 1 1 1 1 1  
## $ am : Factor w/ 2 levels "0","1": 2 1 1 2 2  
## $ gear: Factor w/ 1 level "4": 1 1 1 1 1  
## $ mpg : num 22.8 24.4 22.8 32.4 30.4  
## $ gpm : num 0.044 0.041 0.044 0.031 0.033

# Question 4

## II

df<- alcohol  
df\_filtered <- filter(df, status!=1)  
table(df\_filtered$status)

##   
## 2 3   
## 316 8822