Stat 123 Homework 12

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```
knitr::opts_knit$set(root.dir =
"C:\\Users\\jon\\Documents\\School\\R\\HW\\HW12")
```

Set the random number seed to 2 and create a vector 'rval' containing a random sample of 10 normals with mean 0 and sd 10.

```
set.seed(2)
rval<-rnorm(10, mean=0, sd = 10)
rval

##  [1]  -8.9691455   1.8484918  15.8784533 -11.3037567  -0.8025176
##  [6]   1.3242028   7.0795473  -2.3969802  19.8447394  -1.3878701
```

Use a "for loop" to find the minimum of the 'rval' vector.

```
for(i in 1:10){
  if(i==1){myMin<-rval[i]}
  else{
    if(myMin > rval[i]){
      myMin<-rval[i]
    }
  }
}
myMin

## [1] -11.30376
```

Use the 'min' function to find the minimum of the 'rval' vector.

```
min(rval)

## [1] -11.30376
```

Create a function named 'fun' whose input is a matrix and whose output is the a list of length two containing: 1. a vector giving the number of unique values per row, and 2. the mean of number of unique values. Name the elements of the list returned by this function "unique" and "mean", respectively.

```
fun <- function(M){

  #Create vector giving the number of unique values per row
  unique <- apply(M, 1, unique)
  unique <- lapply(unique,length)
  mean <- unlist(unique, use.names=FALSE)
```

```
  #mean of number of unique values
  mean <- mean(mean)
  result<-list(unique,mean)
  #Give name to elements
  names(result) <- list(unique="unique", mean="mean")

  return(result)
}
```

Use the 'sample' function to draw 1000 samples from a discrete probability distribution on the integers 1,2,...,6 with probabilities c(0.1, 0.2, 0.3, 0.2, 0.1, 0.1).

```
mySample <- sample(1:6,1000,replace=TRUE, prob=c(0.1, 0.2, 0.3, 0.2, 0.1,
0.1))
```

Create a 100x10 matrix names 'M' containing these values and call your function 'fun' using the 'M' matrix as its argument.

```
M <- matrix(mySample, nrow = 100, ncol = 10, byrow = TRUE)
result <- fun(M)
result
```

```
## $unique
## $unique[[1]]
## [1] 5
##
## $unique[[2]]
## [1] 3
##
## $unique[[3]]
## [1] 6
##
## $unique[[4]]
## [1] 5
##
## $unique[[5]]
## [1] 5
##
## $unique[[6]]
## [1] 5
##
## $unique[[7]]
## [1] 6
##
## $unique[[8]]
## [1] 4
##
## $unique[[9]]
## [1] 5
##
## $unique[[10]]
```

```
## [1] 6
##
## $unique[[11]]
## [1] 6
##
## $unique[[12]]
## [1] 5
##
## $unique[[13]]
## [1] 4
##
## $unique[[14]]
## [1] 5
##
## $unique[[15]]
## [1] 5
##
## $unique[[16]]
## [1] 6
##
## $unique[[17]]
## [1] 5
##
## $unique[[18]]
## [1] 4
##
## $unique[[19]]
## [1] 5
##
## $unique[[20]]
## [1] 5
##
## $unique[[21]]
## [1] 6
##
## $unique[[22]]
## [1] 4
##
## $unique[[23]]
## [1] 6
##
## $unique[[24]]
## [1] 3
##
## $unique[[25]]
## [1] 5
##
## $unique[[26]]
## [1] 5
##
```

```
## $unique[[27]]
## [1] 5
##
## $unique[[28]]
## [1] 4
##
## $unique[[29]]
## [1] 5
##
## $unique[[30]]
## [1] 4
##
## $unique[[31]]
## [1] 3
##
## $unique[[32]]
## [1] 5
##
## $unique[[33]]
## [1] 6
##
## $unique[[34]]
## [1] 5
##
## $unique[[35]]
## [1] 3
##
## $unique[[36]]
## [1] 4
##
## $unique[[37]]
## [1] 5
##
## $unique[[38]]
## [1] 5
##
## $unique[[39]]
## [1] 5
##
## $unique[[40]]
## [1] 4
##
## $unique[[41]]
## [1] 4
##
## $unique[[42]]
## [1] 5
##
## $unique[[43]]
## [1] 4
```

```
##
## $unique[[44]]
## [1] 6
##
## $unique[[45]]
## [1] 4
##
## $unique[[46]]
## [1] 5
##
## $unique[[47]]
## [1] 4
##
## $unique[[48]]
## [1] 4
##
## $unique[[49]]
## [1] 5
##
## $unique[[50]]
## [1] 4
##
## $unique[[51]]
## [1] 6
##
## $unique[[52]]
## [1] 6
##
## $unique[[53]]
## [1] 5
##
## $unique[[54]]
## [1] 4
##
## $unique[[55]]
## [1] 6
##
## $unique[[56]]
## [1] 5
##
## $unique[[57]]
## [1] 5
##
## $unique[[58]]
## [1] 4
##
## $unique[[59]]
## [1] 5
##
## $unique[[60]]
```

```
## [1] 6
##
## $unique[[61]]
## [1] 4
##
## $unique[[62]]
## [1] 4
##
## $unique[[63]]
## [1] 6
##
## $unique[[64]]
## [1] 6
##
## $unique[[65]]
## [1] 6
##
## $unique[[66]]
## [1] 6
##
## $unique[[67]]
## [1] 4
##
## $unique[[68]]
## [1] 5
##
## $unique[[69]]
## [1] 6
##
## $unique[[70]]
## [1] 4
##
## $unique[[71]]
## [1] 5
##
## $unique[[72]]
## [1] 5
##
## $unique[[73]]
## [1] 5
##
## $unique[[74]]
## [1] 5
##
## $unique[[75]]
## [1] 4
##
## $unique[[76]]
## [1] 5
##
```

```
## $unique[[77]]
## [1] 5
##
## $unique[[78]]
## [1] 4
##
## $unique[[79]]
## [1] 4
##
## $unique[[80]]
## [1] 4
##
## $unique[[81]]
## [1] 4
##
## $unique[[82]]
## [1] 4
##
## $unique[[83]]
## [1] 6
##
## $unique[[84]]
## [1] 6
##
## $unique[[85]]
## [1] 5
##
## $unique[[86]]
## [1] 4
##
## $unique[[87]]
## [1] 4
##
## $unique[[88]]
## [1] 5
##
## $unique[[89]]
## [1] 5
##
## $unique[[90]]
## [1] 5
##
## $unique[[91]]
## [1] 5
##
## $unique[[92]]
## [1] 5
##
## $unique[[93]]
## [1] 5
```

```
##
## $unique[[94]]
## [1] 5
##
## $unique[[95]]
## [1] 5
##
## $unique[[96]]
## [1] 4
##
## $unique[[97]]
## [1] 6
##
## $unique[[98]]
## [1] 4
##
## $unique[[99]]
## [1] 5
##
## $unique[[100]]
## [1] 4
##
##
## $mean
## [1] 4.82
```