```r
rm(list = ls())
load('dat_cor.Rdata')
library(compositions)
library(factoextra)
library(data.table)
library(tidyverse)
library(caret)
set.seed(100)


trainIdx = sample(c(TRUE, FALSE), nrow(dat_cor$level1), replace = TRUE, prob = c(.7, .3))
dat = dat_cor$level1 %>% select(-c(rawid,Gender,Age)) %>% acomp() %>%
  prcomp(scale. = T)
dat = as.data.frame(dat$x) %>% mutate(Age = as.factor(dat_cor$level1$Age))

dat.train = dat[trainIdx,]
dat.test = dat[!trainIdx,]

head(dat)
```

```
##          PC1          PC2         PC3          PC4          PC5
## 1 -0.3424159 -0.108281204  0.05959462  0.035628434 -0.018697171
## 2 -0.3750743  0.123439274 -0.03432115 -0.054540872 -0.027461756
## 3 -0.3565372 -0.023725505  0.01419742 -0.058136897 -0.004110037
## 4 -0.3511161  0.040979809  0.06185771  0.025311492  0.003473005
## 5 -0.4106114  0.224633694 -0.17781546  0.003658623  0.059120380
## 6 -0.3455103 -0.000568299  0.07696054  0.011113352 -0.013977395
##            PC6          PC7           PC8   Age
## 1 -0.004487872  0.006536168 -0.0009247566 26-30
## 2 -0.015076900 -0.004827343  0.0061869122 26-30
## 3 -0.011157492 -0.003001797 -0.0064643510 31-35
## 4  0.066950862 -0.011877544  0.0004885213 26-30
## 5 -0.014429554 -0.009561168  0.0032742079 31-35
## 6  0.044316937 -0.015501322 -0.0037126099 22-25
```

```r
# multinomial regression
multinomModel = train(Age~.,data = dat.train,
              method = "multinom",trace = F )
# multinomial.predicted_score = predict (multinomModel, dat.test, "prob")
dat.prediction = predict(multinomModel, dat.test)

print(paste('Accuracy',table(dat.prediction == dat.test$Age)["TRUE"]/length(dat.test$Age)))
```

```
## [1] "Accuracy 0.453571428571429"
```

```r
# SVM
svmModel = train(Age~.,data = dat.train,
                 method = "svmLinear",trace = F)
dat.prediction = predict(svmModel,dat.test)

print(paste('Accuracy',table(dat.prediction == dat.test$Age)["TRUE"]/length(dat.test$Age)))
```

```
## [1] "Accuracy 0.460714285714286"
```

```r
# Multi-Layer Perceptron
neuralModel = train(Age~.,data = dat.train,
```

```
                    method = "mlp",trace = F)
dat.prediction = predict(neuralModel,dat.test)

print(paste('Accuracy',table(dat.prediction == dat.test$Age)["TRUE"]/length(dat.test$Age)))
```

```
## [1] "Accuracy 0.460714285714286"
```