Experiment -5

1. **Use Factor analysis for the given data set for the dimension reduction.**
2. **For the given data, based on the scree plot, find out the number of factors in factor analysis.**
3. **Plot Factor Analysis output and explain the visualization part of the dimension reduction techniques.**

Program:

```
require(MASS)
require(clusterGeneration)
set.seed(2)
num.vars<-15
num.obs<-200
cov.mat<-genPositiveDefMat(num.vars, covMethod="unifcorrmat")$Sigma
rand.vars<-mvrnorm(num.obs,rep(0,num.vars),Sigma=cov.mat)
cov.mat
rand.vars

parms<-runif(num.vars,-10,10)

y<-rand.vars %*% matrix(parms) + rnorm(num.obs,sd=20)
lm.dat<-data<-data.frame(y,rand.vars)
form.in<-paste('y~', paste(names(lm.dat)[-1], collapse='+'))
mod1<-lm(form.in,data=lm.dat)
summary(mod1)
vif_func(in_frame=rand.vars, thresh=5,trace=T)

keep.dat<-vif_func(in_frame=rand.vars, thresh=5, trace=F)
form.in<-paste('y~', paste(keep.dat, collapse='+'))
mod2<-lm(form.in,data=lm.dat)
```

```
summary(mod2)
```

Output: