Factor Analyzing a Pearson Correlation Matrix

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This post includes the **R** code for conducting exploratory factor analysis using a Pearson correlation matrix within the `psych` package. This post only includes the code and output.

1 Read in the data

```
efa<-read.table("C:\\Users\\grant_morgan\\Box Sync\\Teaching\\EDP 6365 - Latent Variable Models
```

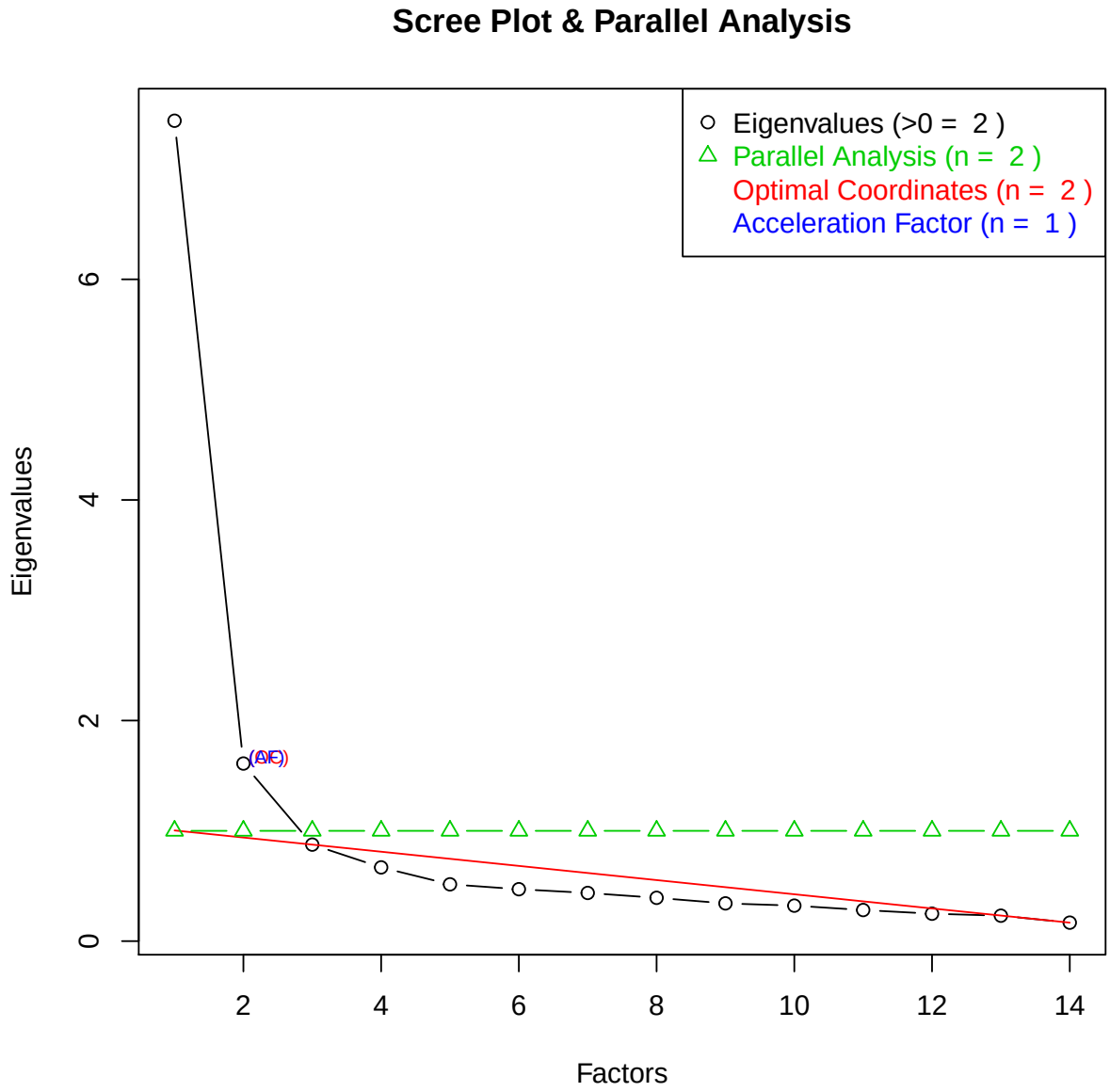
2 Obtain eigenvalues

```
evalues<-eigen(cor(efa))$values
evalues

##  [1] 7.4378 1.6100 0.8750 0.6687 0.5150 0.4708 0.4369 0.3928 0.3423 0.3217
## [11] 0.2819 0.2487 0.2307 0.1677
```

3 Generate screen plot & Conduct parallel analysis

```
library(nFactors)
plotnScree(nScree(evalues, model="factors"), main="Scree Plot & Parallel Analysis")
```



4 Extract factors using principal axis factoring

I will extract two factors for the reasons we discussed in class.

```
efa.out<-fa(r=efa, fm="pa", nfactors=2, rotate="promax", residual=TRUE)
print(efa.out$loadings, cutoff=0)

##
## Loadings:
##     PA1    PA2
## v1   0.787  0.049
## v2   0.720 -0.098
```

```
## v3   0.899 -0.227
## v4   0.595  0.236
## v5   0.580  0.289
## v6   0.607  0.125
## v7   0.481  0.119
## v8   0.644  0.157
## v9   0.783 -0.104
## v10  0.056  0.792
## v11 -0.029  0.847
## v12 -0.024  0.875
## v13 -0.016  0.789
## v14  0.029  0.831
##
##                  PA1   PA2
## SS loadings    4.269 3.692
## Proportion Var 0.305 0.264
## Cumulative Var 0.305 0.569
```

```
efa.out$Phi
```

```
##        [,1]   [,2]
## [1,] 1.0000 0.6698
## [2,] 0.6698 1.0000
```