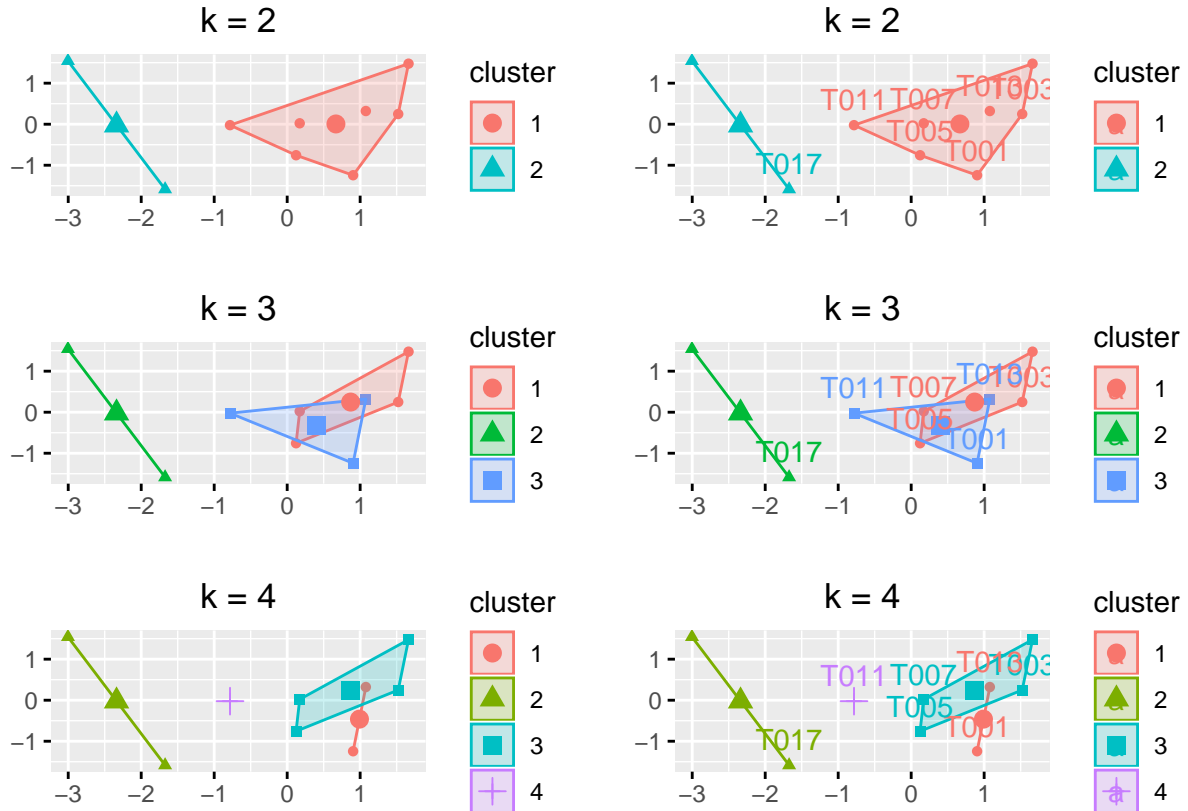


Clustering

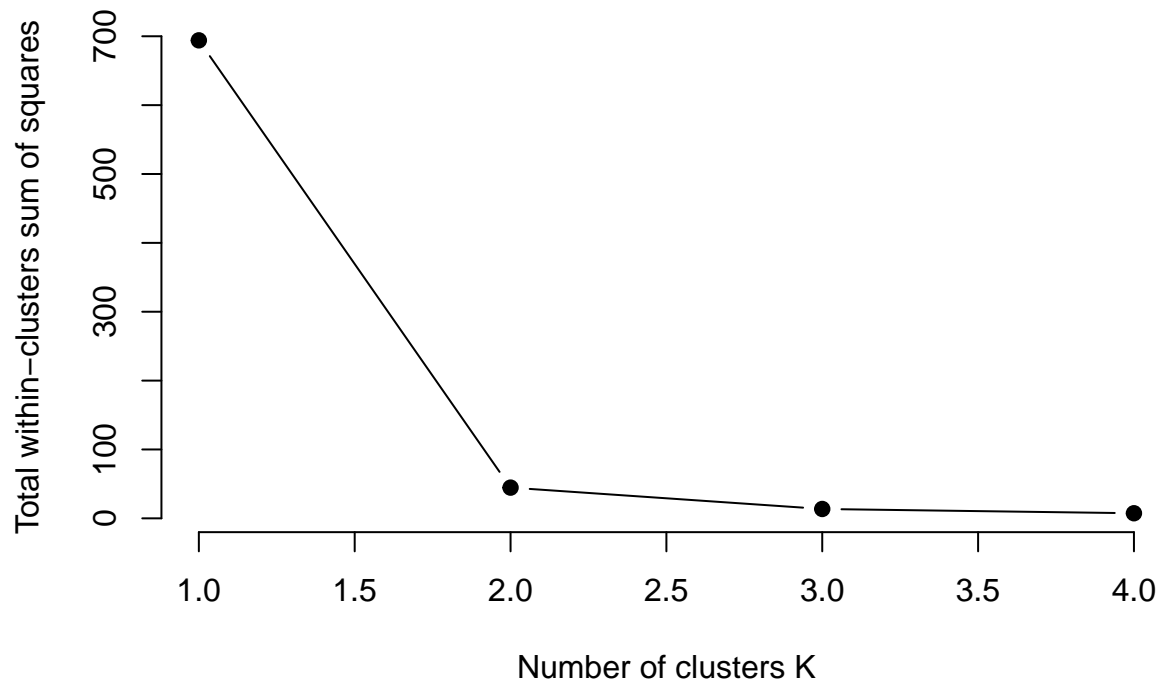
Clustering with PP and Trait Anxiety



Determining Optimal Clusters

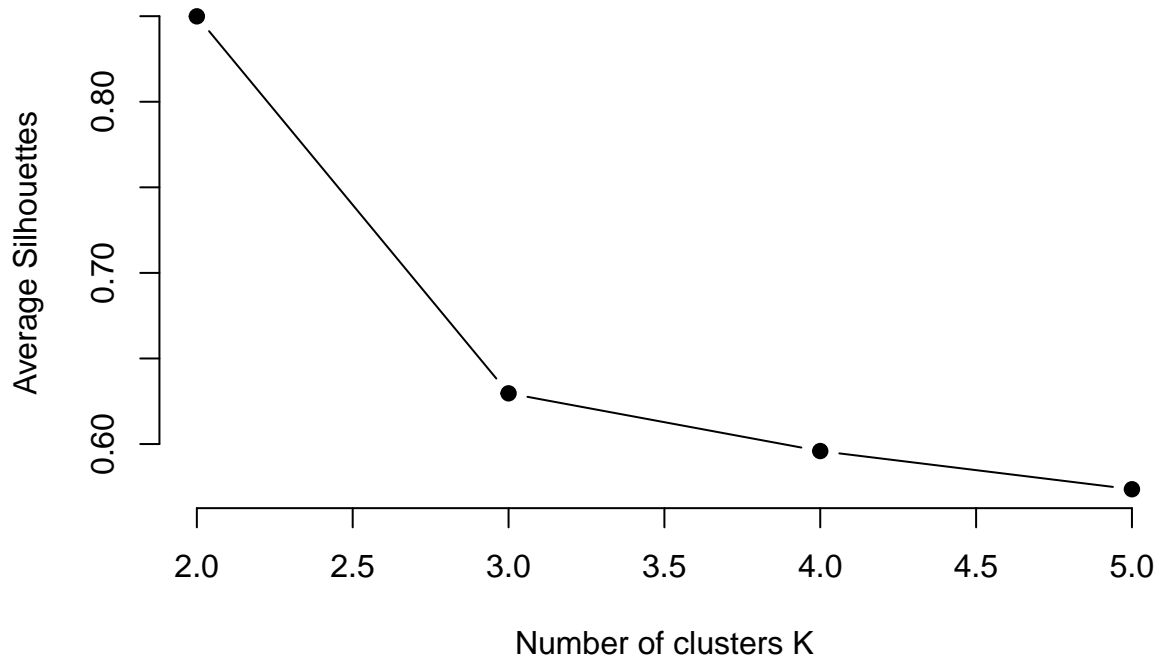
Elbow Method: For each k , calculate the total within-cluster sum of square (wss). Plot the curve of wss according to the number of clusters k . The location of a bend (knee) in the plot is generally considered as an indicator of the appropriate number of clusters.

Optimal Clusters using Elbow Method



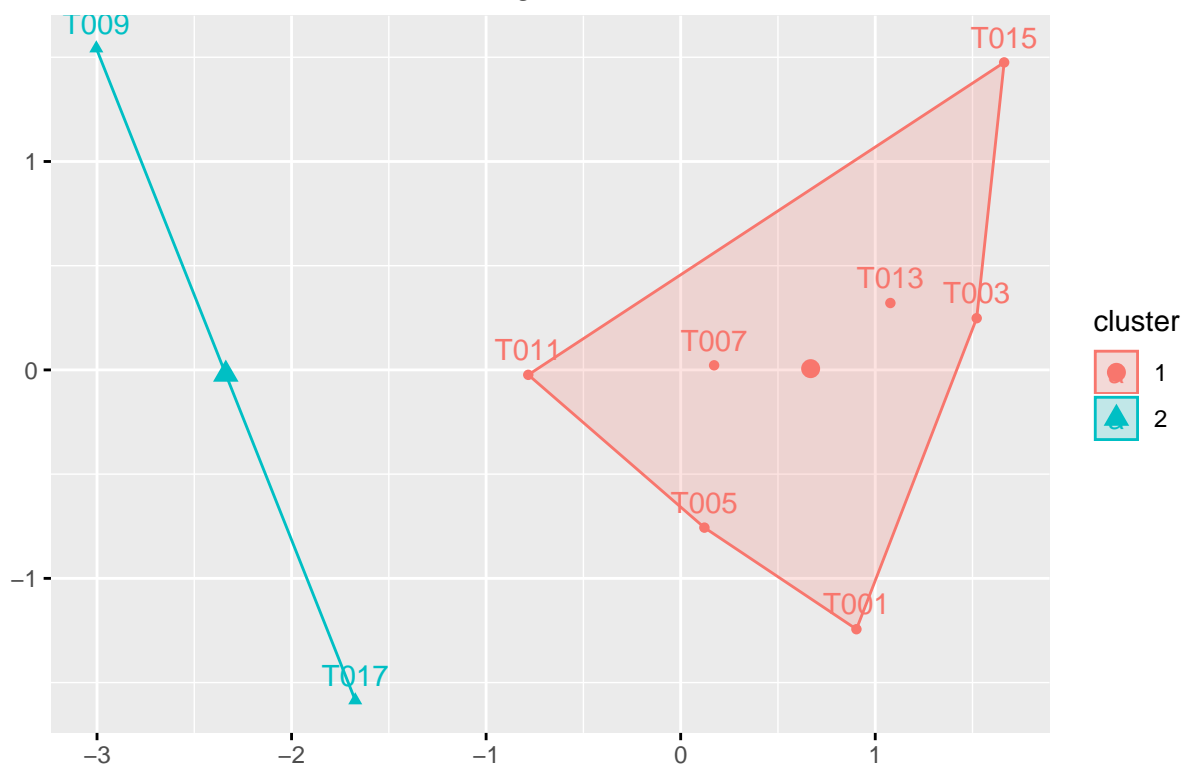
Average Silhouette Method In short, the average silhouette approach measures the quality of a clustering. That is, it determines how well each object lies within its cluster. A high average silhouette width indicates a good clustering. The average silhouette method computes the average silhouette of observations for different values of k . The optimal number of clusters k is the one that maximizes the average silhouette over a range of possible values for k .

Optimal Clusters using Average silhouette Method

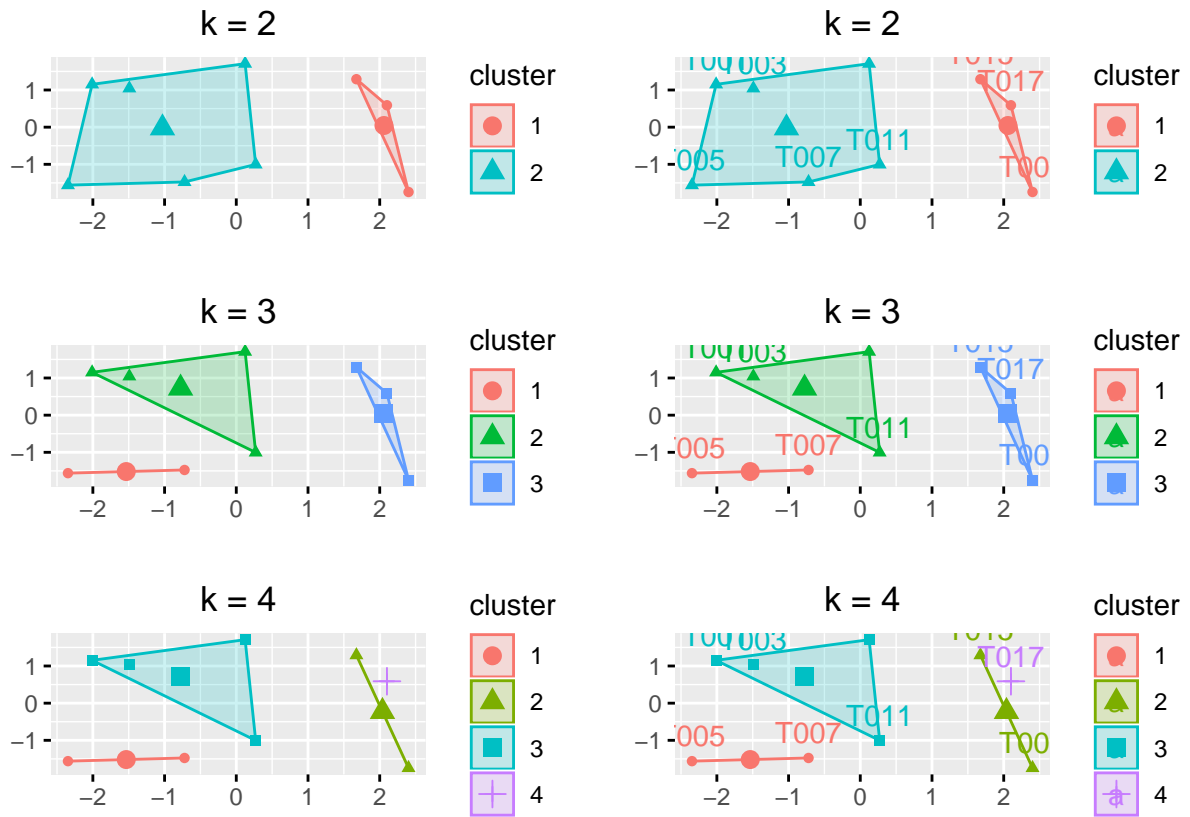


```
## K-means clustering with 2 clusters of sizes 7, 2
##
## Cluster means:
##      Day1      Day2      Day3      Day4 Trait_anxiety
## 1 0.0533592 0.1004286 0.09814956 0.07895523      36.57143
## 2 0.1836038 0.1896380 0.18426456 0.45276027      57.00000
##
## Clustering vector:
## T001 T003 T005 T007 T009 T011 T013 T015 T017
##    1    1    1    1    2    1    1    1    2
##
## Within cluster sum of squares by cluster:
## [1] 42.328493 2.292059
## (between_SS / total_SS = 93.6 %)
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"
## [5] "tot.withinss" "betweenss"    "size"         "iter"
## [9] "ifault"
```

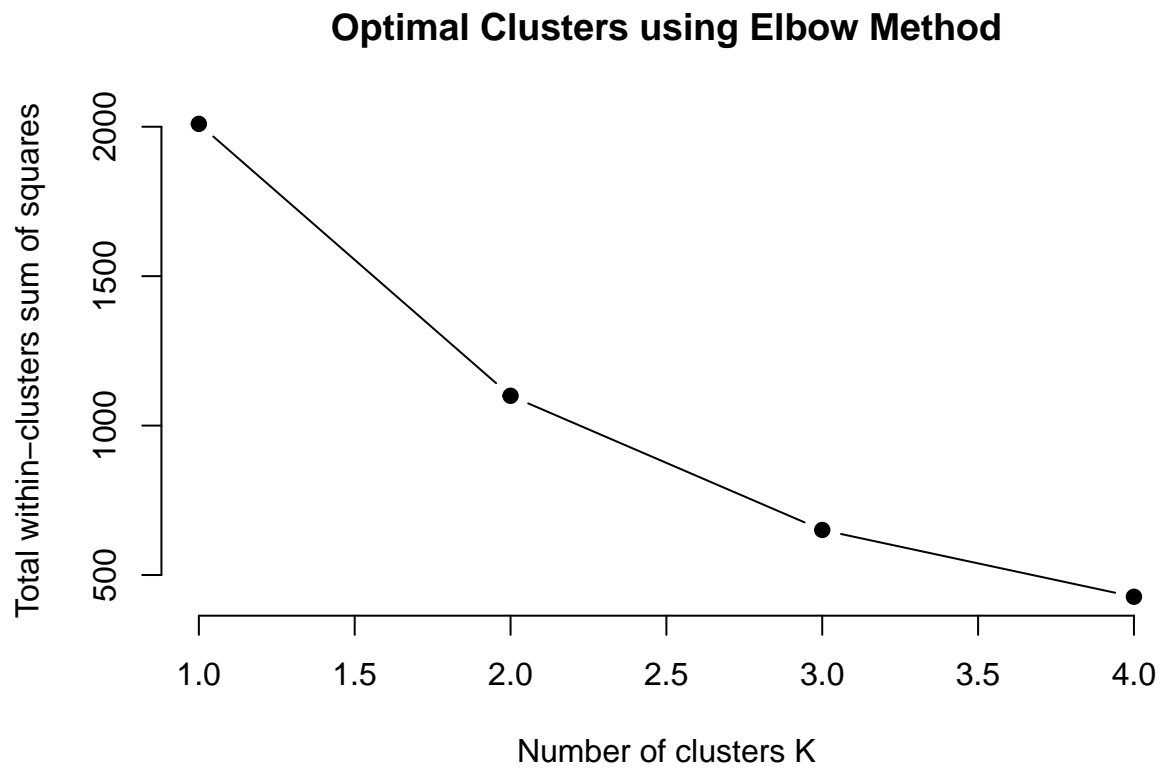
Cluster using PP-Trait; k = 2



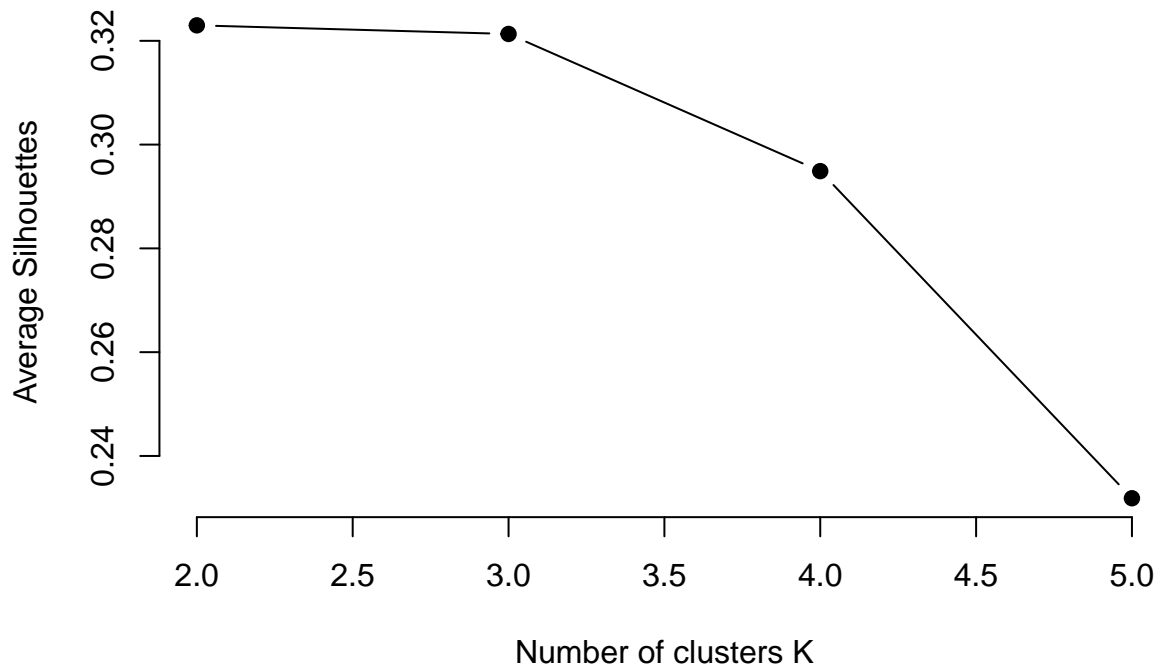
Clustering with PP and BFI



Determining Optimal Clusters

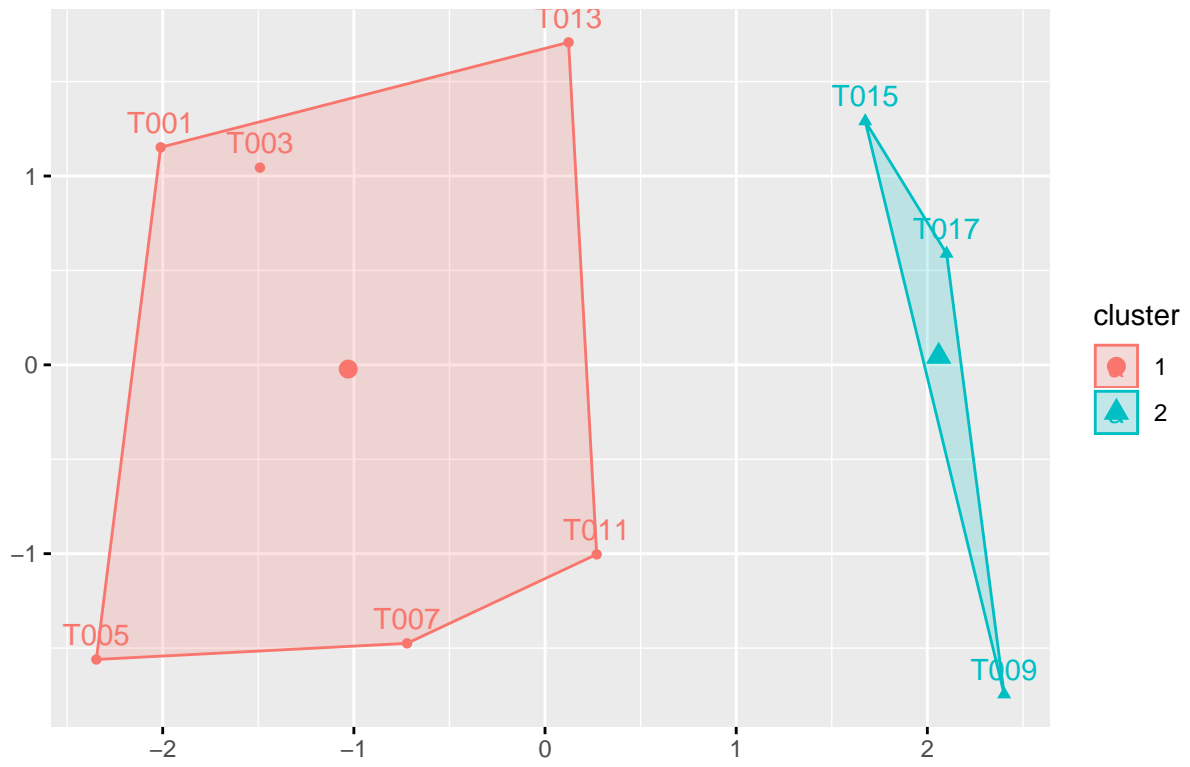


Optimal Clusters using Average silhouette Method

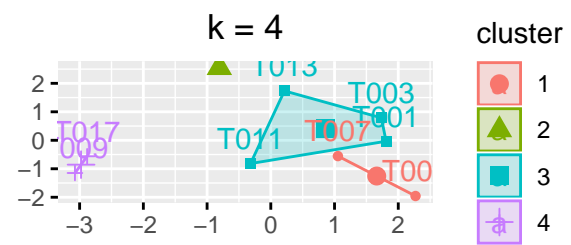
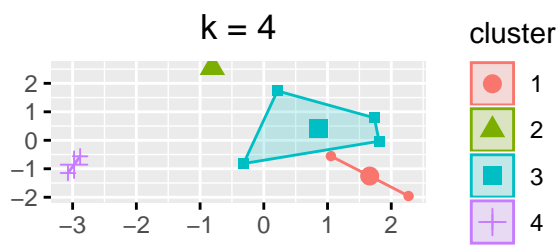
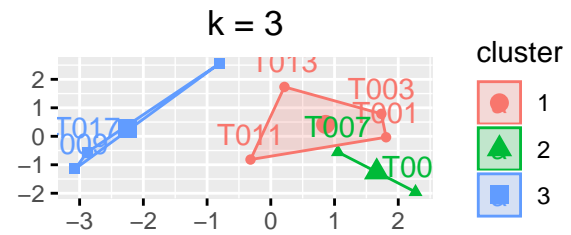
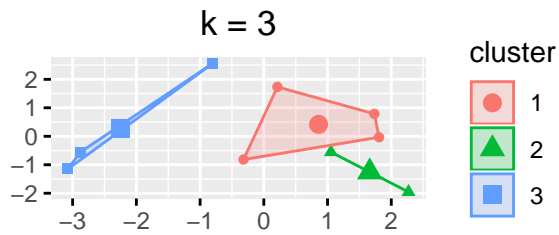
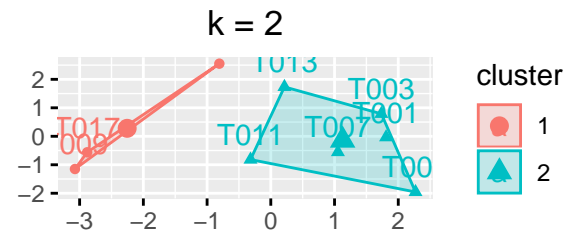
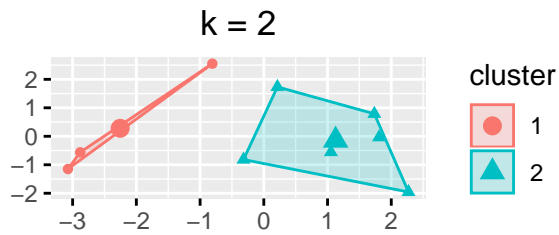


```
## K-means clustering with 2 clusters of sizes 6, 3
##
## Cluster means:
##      Day1      Day2      Day3      Day4 Agreeableness
## 1 0.07637643 0.15183982 0.08174166 0.09751064      35.5
## 2 0.09415449 0.05707908 0.18837536 0.29104778      31.0
##   Conscientiousness Extraversion Neuroticism Openness
## 1      40.83333      28.66667      20.16667 38.50000
## 2      25.33333      21.66667      29.33333 30.66667
##
## Clustering vector:
## T001 T003 T005 T007 T009 T011 T013 T015 T017
##    1    1    1    1    2    1    1    2    2
##
## Within cluster sum of squares by cluster:
## [1] 820.4552 279.2692
## (between_SS / total_SS =  45.3 %)
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"
## [5] "tot.withinss" "betweenss"    "size"         "iter"
## [9] "ifault"
```

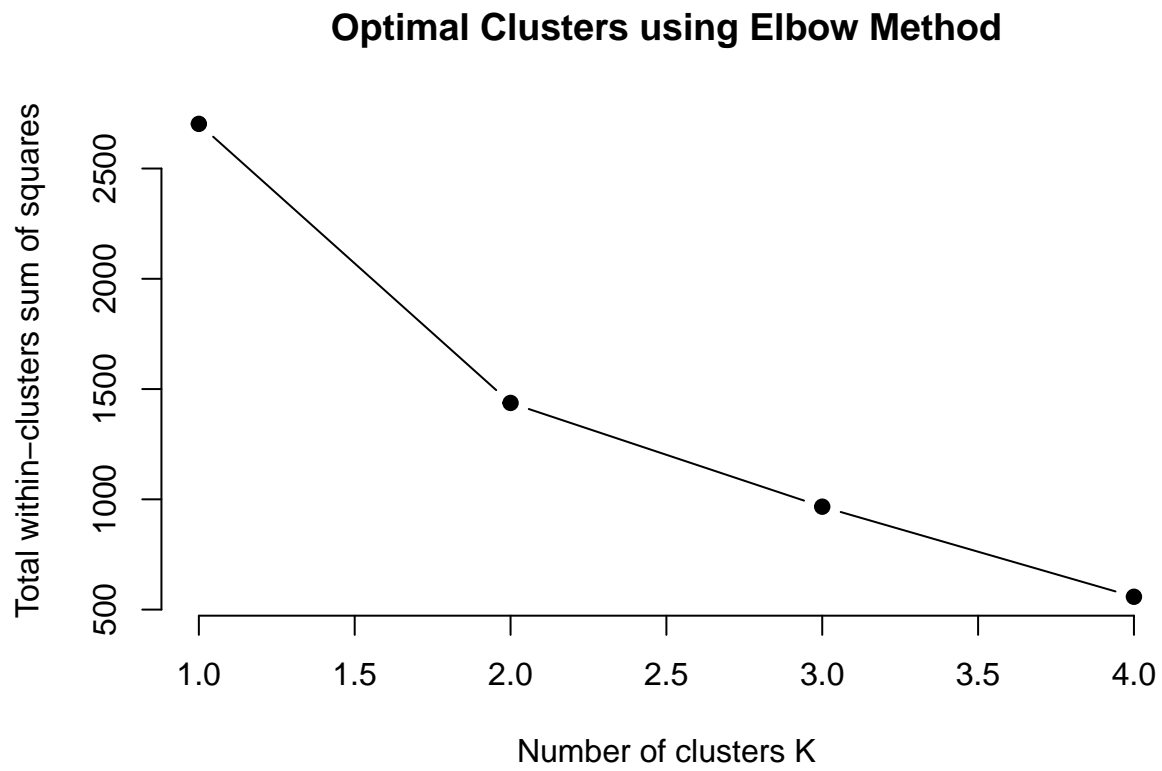
Cluster using PP-BFI; $k = 2$



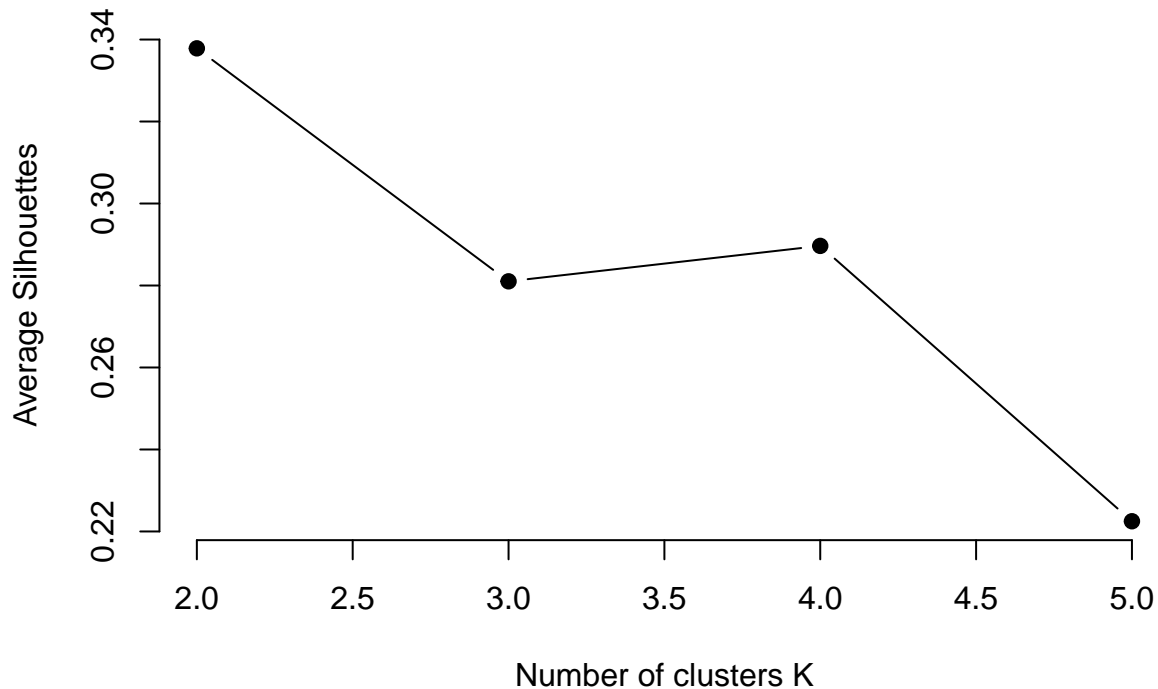
Clustering with PP, Trait Anxiety and BFI



Determining Optimal Clusters



Optimal Clusters using Average silhouette Method



```
## K-means clustering with 2 clusters of sizes 6, 3
##
## Cluster means:
##      Day1      Day2      Day3      Day4 Agreeableness
## 1 0.07637643 0.15183982 0.08174166 0.09751064      35.5
## 2 0.09415449 0.05707908 0.18837536 0.29104778      31.0
##   Conscientiousness Extraversion Neuroticism Openness Trait_anxiety
## 1      40.83333      28.66667      20.16667 38.50000      36.66667
## 2      25.33333      21.66667      29.33333 30.66667      50.00000
##
## Clustering vector:
## T001 T003 T005 T007 T009 T011 T013 T015 T017
##    1    1    1    1    2    1    1    2    2
##
## Within cluster sum of squares by cluster:
## [1] 861.7885 575.2692
## (between_SS / total_SS = 46.8 %)
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"
## [5] "tot.withinss" "betweenss"    "size"         "iter"
## [9] "ifault"
```

Cluster using PP-Trait-BFI; $k = 2$

