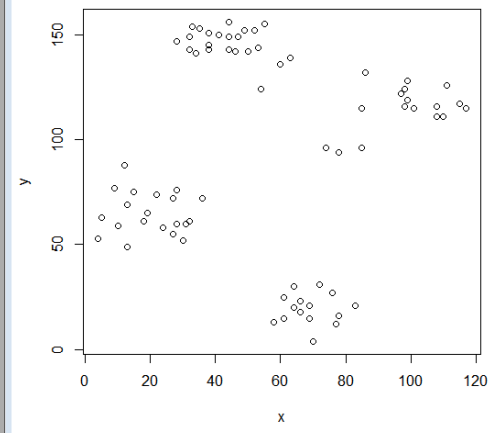
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
+ cl2
Error: unexpected symbol in:
"clusplot(ruspini_scaled, km$cluster)
cl2"
> cl2 = kcca(Nclus, k=4, family=kccaFamily("kmedians"),
+  control=list(initcent="kmeanspp"))
Error in .class1(object) : object 'Nclus' not found
> cl2 = kcca(ruspini, k=4, family=kccaFamily("kmedians"),
+  control=list(initcent="kmeanspp"))
> cl2
Error: object 'cl2' not found
> cl2
kcca object of family 'kmedians'

call:
kcca(x = ruspini, k = 4, family = kccaFamily("kmedians"), control = list(initcent = "kmea$

cluster sizes:

 1  2  3  4
15 12 40  8

> plot(cl2)
> image(cl2)
> points(cl2)
Error in as.double(y) :
  cannot coerce type 'S4' to vector of type 'double'
> points(cl2)
Error in as.double(y) :
  cannot coerce type 'S4' to vector of type 'double'
> barplot(cl2)
> data(ruspini, package="cluster")
> ruspini <- ruspini[sample(1:nrow(ruspini)),]
> plot(ruspini)
>
```

R Graphics: Device 2 (ACTIVE)



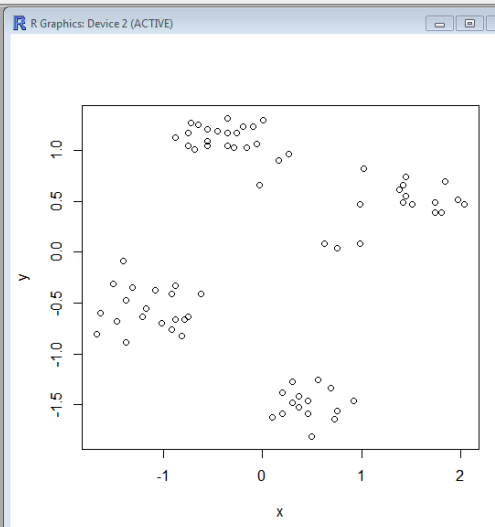
RGui (64-bit)

File Edit View Misc Packages Windows Help

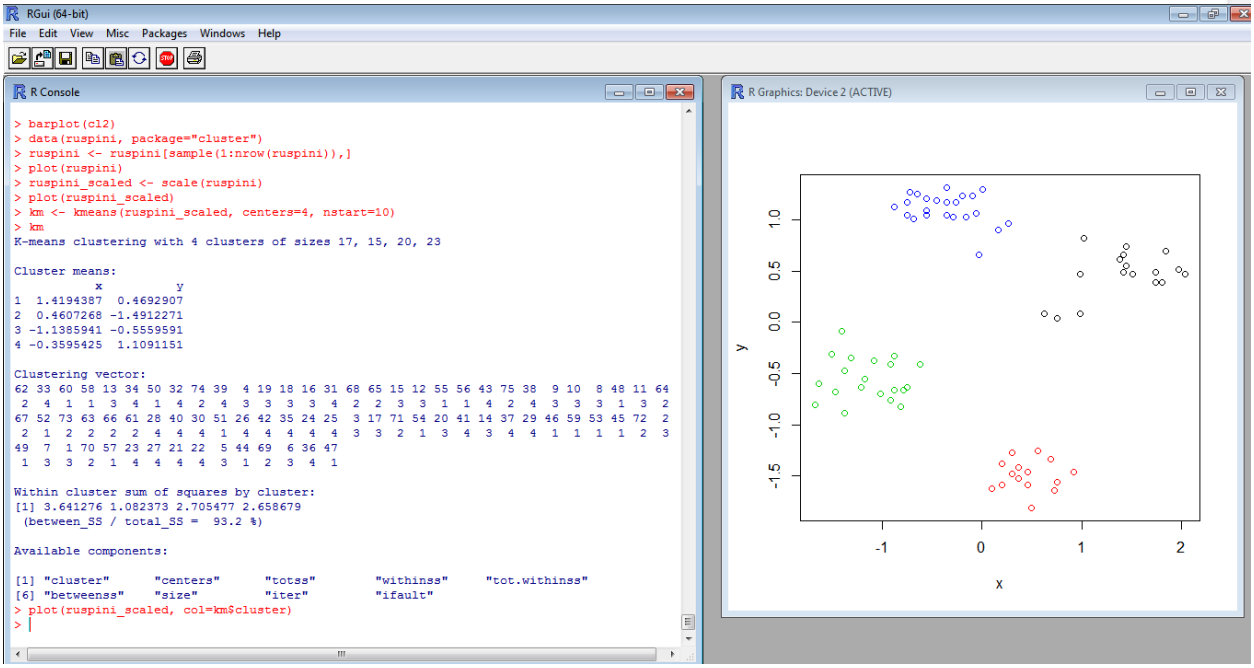
R Console

```
"clusplot(ruspini_scaled, km$cluster)
cl2"
> cl2 = kcca(Nclus, k=4, family=kccaFamily("kmedians"),
+  control=list(initcent="kmeanspp"))
Error in .class1(object) : object 'Nclus' not found
> cl2 = kcca(ruspini, k=4, family=kccaFamily("kmedians"),
+  control=list(initcent="kmeanspp"))
> cl2
Error: object 'cl2' not found
> cl2
kcca object of family 'kmedians'

call:
kcca(x = ruspini, k = 4, family = kccaFamily("kmedians"), control = list(initcent = "kmea$

cluster sizes:

 1  2  3  4
15 12 40  8

> plot(cl2)
> image(cl2)
> points(cl2)
Error in as.double(y) :
  cannot coerce type 'S4' to vector of type 'double'
> points(cl2)
Error in as.double(y) :
  cannot coerce type 'S4' to vector of type 'double'
> barplot(cl2)
> data(ruspini, package="cluster")
> ruspini <- ruspini[sample(1:nrow(ruspini)),]
> plot(ruspini)
> ruspini_scaled <- scale(ruspini)
> plot(ruspini_scaled)
>
```

R Graphics: Device 2 (ACTIVE)



```
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
           x          y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> 
```



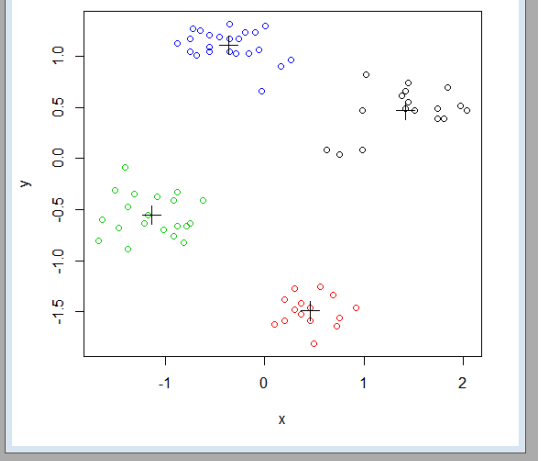
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
> data(ruspini, package="cluster")
> ruspini <- ruspini[sample(1:nrow(ruspini)),]
> plot(ruspini)
> ruspini_scaled <- scale(ruspini)
> plot(ruspini_scaled)
> km <- kmeans(ruspini_scaled, centers=4, nstart=10)
> km
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
          x          y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
>
```

R Graphics: Device 2 (ACTIVE)



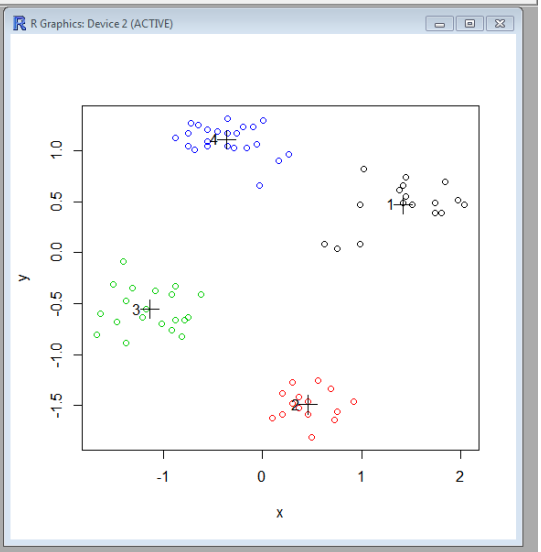
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
> ruspini <- ruspini[sample(1:nrow(ruspini)),]
> plot(ruspini)
> ruspini_scaled <- scale(ruspini)
> plot(ruspini_scaled)
> km <- kmeans(ruspini_scaled, centers=4, nstart=10)
> km
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
          x          y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
> text(km$centers, labels=1:4, pos=2)
>
```

R Graphics: Device 2 (ACTIVE)



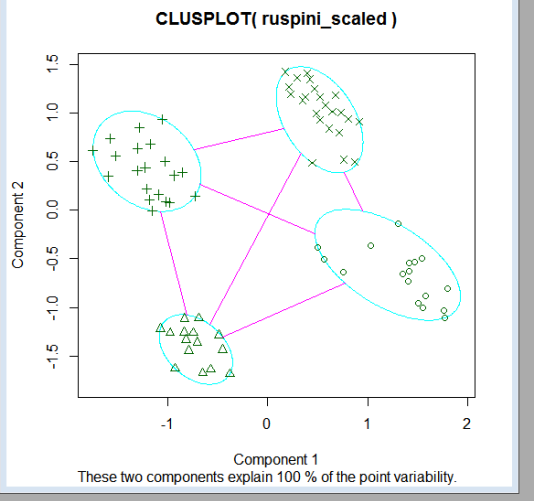
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
> ruspini_scaled <- scale(ruspini)
> plot(ruspini_scaled)
> km <- kmeans(ruspini_scaled, centers=4, nstart=10)
> km
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
          x          y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
> text(km$centers, labels=1:4, pos=2)
> library(cluster)
> clusplot(ruspini_scaled, km$cluster)
>
```

R Graphics: Device 2 (ACTIVE)



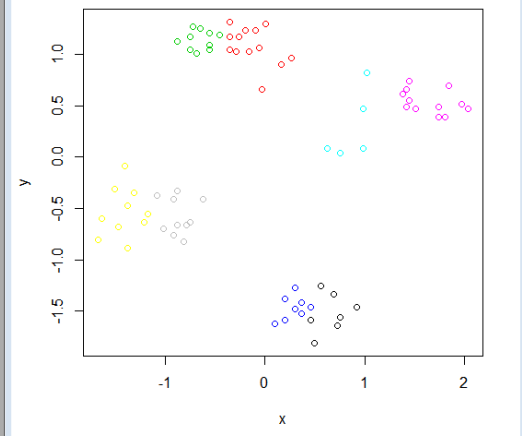
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
> plot(ruspini_scaled)
> km <- kmeans(ruspini_scaled, centers=4, nstart=10)
> km
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
          x          y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
> text(km$centers, labels=1:4, pos=2)
> library(cluster)
> clusplot(ruspini_scaled, km$cluster)
> plot(ruspini_scaled, col=kmeans(ruspini_scaled, centers=10)$cluster)
>
```

R Graphics: Device 2 (ACTIVE)



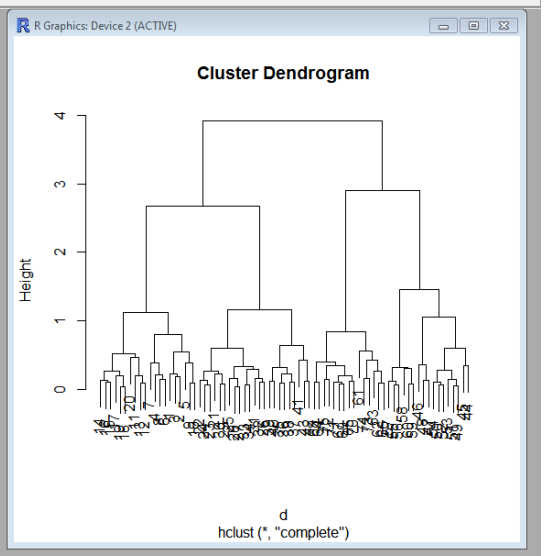
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
K-means clustering with 4 clusters of sizes 17, 15, 20, 23

Cluster means:
          x         y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
> text(km$centers, labels=1:4, pos=2)
> library(cluster)
> clusplot(ruspini_scaled, km$cluster)
> plot(ruspini_scaled, col=kmeans(ruspini_scaled, centers=10)$cluster)
> d <- dist(ruspini_scaled)
> hc <- hclust(d, method="complete")
> plot(hc)
>
```

R Graphics: Device 2 (ACTIVE)



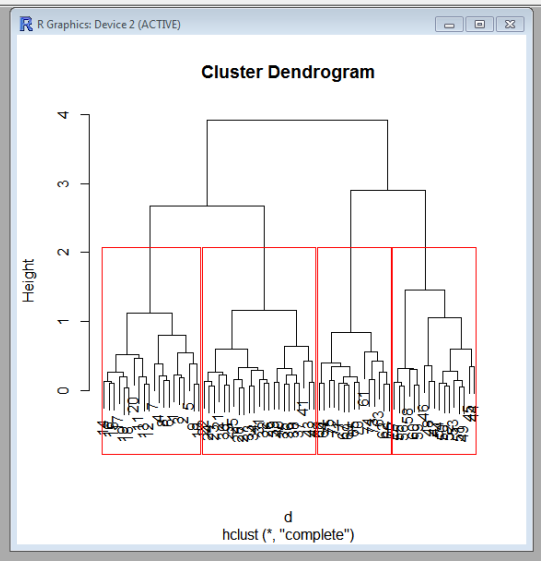
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
Cluster means:
          x         y
1  1.4194387  0.4692907
2  0.4607268 -1.4912271
3 -1.1385941 -0.5559591
4 -0.3595425  1.1091151

Clustering vector:
62 33 60 58 13 34 50 32 74 39  4 19 18 16 31 68 65 15 12 55 56 43 75 38  9 10  8 48 11 64
 2  4  1  1  3  4  1  4  2  4  3  3  3  3  4  2  2  3  3  1  1  4  2  4  3  3  3  1  3  2
67 52 73 63 66 61 28 40 30 51 26 42 35 24 25  3 17 71 54 20 41 14 37 29 46 59 53 45 72  2
 2  1  2  2  2  2  4  4  4  1  4  4  4  4  4  3  3  2  1  3  4  3  4  4  1  1  1  1  2  3
49  7  1 70 57 23 27 21 22  5 44 69  6 36 47
 1  3  3  2  1  4  4  4  4  3  1  2  3  4  1

Within cluster sum of squares by cluster:
[1] 3.641276 1.082373 2.705477 2.658679
 (between_SS / total_SS =  93.2 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> plot(ruspini_scaled, col=km$cluster)
> points(km$centers, pch=3, cex=2)
> text(km$centers, labels=1:4, pos=2)
> library(cluster)
> clusplot(ruspini_scaled, km$cluster)
> plot(ruspini_scaled, col=kmeans(ruspini_scaled, centers=10)$cluster)
> d <- dist(ruspini_scaled)
> hc <- hclust(d, method="complete")
> plot(hc)
> rect.hclust(hc, k=4)
>
```

R Graphics: Device 2 (ACTIVE)



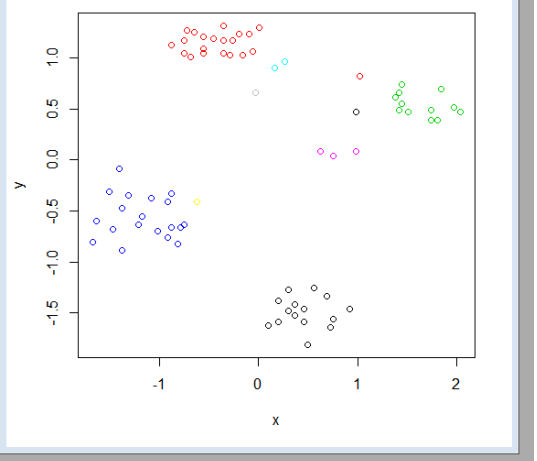
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
37  50 142
29  32 143
46  85  96
59 115 117
53  99 128
45  85 115
72  61  25
2    5  63
49  97 122
7   12  88
1    4  53
70  69  21
57 108 116
23  35 153
27  38 145
21  28 147
22  32 149
5   13  49
44  86 132
69  64  20
6   13  69
36  49 152
47  78  94
> plot(ruspini_scaled, col=cutree(hc_single, k=10))
Error in nrow(tree$merge) : object 'hc_single' not found
> plot(ruspini_scaled, col=cutree(hc_single, k=10))
Error in nrow(tree$merge) : object 'hc_single' not found
>
> plot(ruspini_scaled, col=cutree(hc_single, k=10))
Error in nrow(tree$merge) : object 'hc_single' not found
> hc_single <- hclust(d, method="single")
> cluster_single <- cutree(hc_single, k=4)
> plot(ruspini_scaled, col=cluster_single)
> plot(ruspini_scaled, col=cutree(hc_single, k=10))
>
```

R Graphics: Device 2 (ACTIVE)



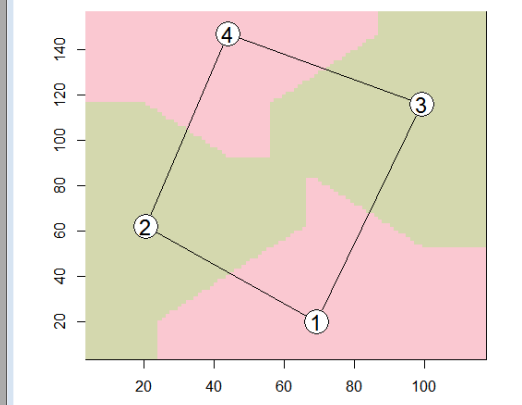
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
59 115 117
53  99 128
45  85 115
72  61  25
2    5  63
49  97 122
7   12  88
1    4  53
70  69  21
57 108 116
23  35 153
27  38 145
21  28 147
22  32 149
5   13  49
44  86 132
69  64  20
6   13  69
36  49 152
47  78  94
> cl2 = kcca(ruspini, k=4, family=kccaFamily("kmedians"),
+             control=list(initcent="kmeanspp"))
> cl2
kcca object of family 'kmedians'

call:
kcca(x = ruspini, k = 4, family = kccaFamily("kmedians"), control = list(initcent = "kmea$

cluster sizes:

 1  2  3  4
15 20 17 23

> image(cl2)
```

R Graphics: Device 2 (ACTIVE)



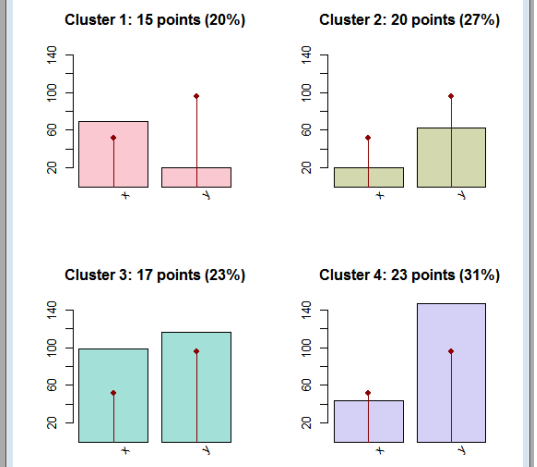
RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
45  85 115
72  61  25
2    5  63
49  97 122
7   12  88
1    4  53
70  69  21
57 108 116
23  35 153
27  38 145
21  28 147
22  32 149
5   13  49
44  86 132
69  64  20
6   13  69
36  49 152
47  78  94
> cl2 = kcca(ruspini, k=4, family=kccaFamily("kmedians"),
+            control=list(initcent="kmeanspp"))
> cl2
kcca object of family 'kmedians'

call:
kcca(x = ruspini, k = 4, family = kccaFamily("kmedians"), control = list(initcent = "kmea$

cluster sizes:

 1  2  3  4
15 20 17 23

> image(cl2)
> points(ruspini)
> barplot(cl2)
>
```

R Graphics: Device 2 (ACTIVE)



RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
kcca object of family 'kmedians'

call:
kcca(x = ruspini, k = 4, family = kccaFamily("kmedians"), control = list(initcent = "kmea$

cluster sizes:

 1  2  3  4
15 20 17 23

> image(cl2)
> points(ruspini)
> barplot(cl2)
> set.seed(101)
> xs1 <- sample(seq(-2,2,len=201), 40)
> ys1 <- intercept1 + slope1*xs1 + rnorm(length(xs1),0,.15)
Error: object 'intercept1' not found
> slope1 <- -.3; intercept1 <- 1.5
> ys1 <- intercept1 + slope1*xs1 + rnorm(length(xs1),0,.15)
> slope2 <- 1.2; intercept2 <- -.4
> xs2 <- sample(seq(-2,2,len=201), 40)
> ys2 <- intercept2 + slope2*xs2 + rnorm(length(xs1),0,.15)
>
> mydata <- rbind( cbind(xs1,ys1), cbind(xs2,ys2)
+ plot(mydata, pch=19, xlab="X", ylab="Y")
Error: unexpected symbol in:
"mydata <- rbind( cbind(xs1,ys1), cbind(xs2,ys2)
plot"
> plot(mydata, pch=19, xlab="X", ylab="Y") )
Error: unexpected ')' in "plot(mydata, pch=19, xlab="X", ylab="Y") )"
> mydata <- rbind( cbind(xs1,ys1), cbind(xs2,ys2))
> plot(mydata, pch=19, xlab="X", ylab="Y") )
Error: unexpected ')' in "plot(mydata, pch=19, xlab="X", ylab="Y") )"
> plot(mydata, pch=19, xlab="X", ylab="Y")
>
```

R Graphics: Device 2 (ACTIVE)