ISLR Lab 10.5.1

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October 16, 2025

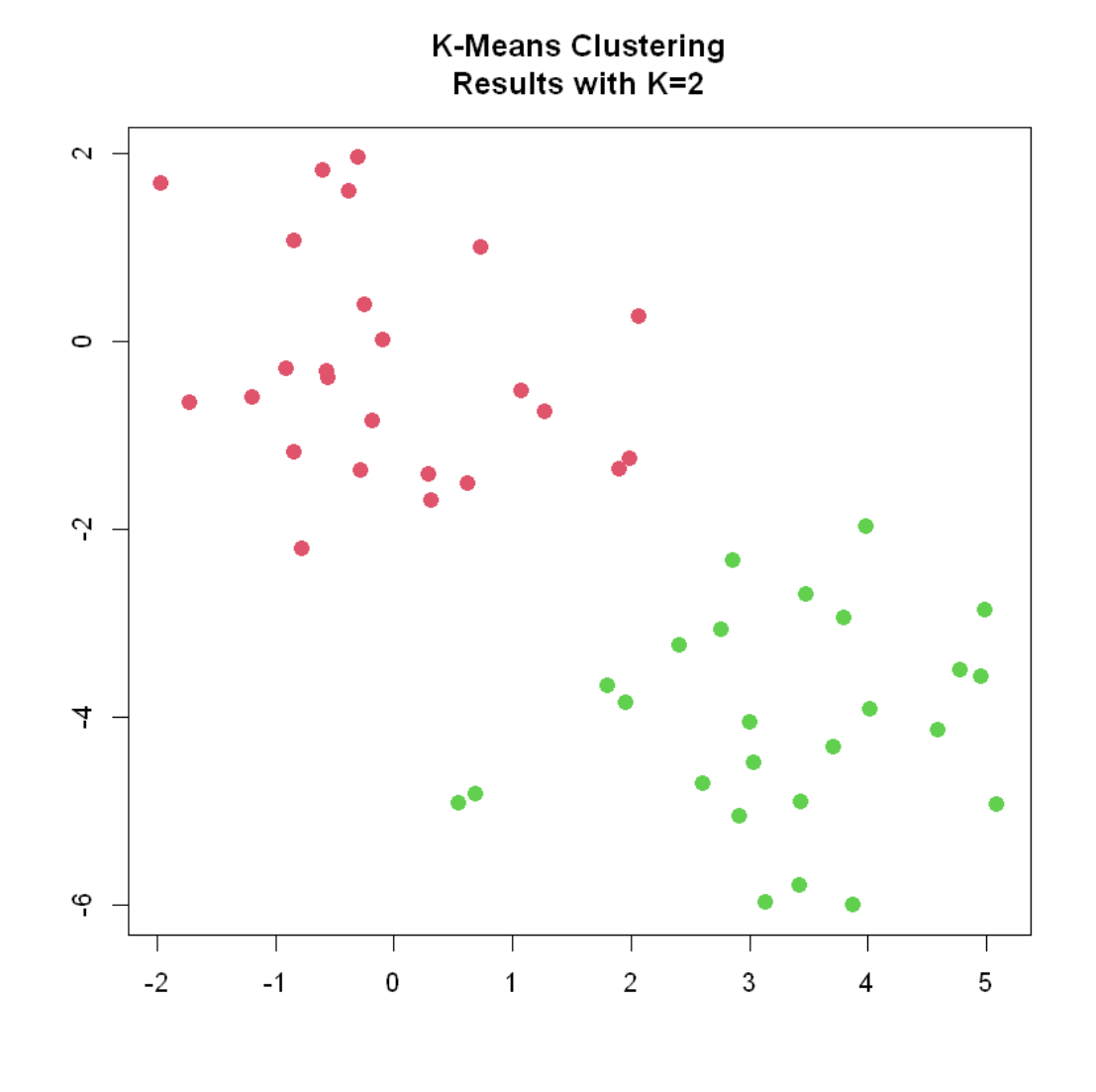
[1]:
```
set.seed(2)
```

[2]:
```
x=matrix(rnorm (50*2), ncol=2)
x[1:25,1]=x[1:25,1]+3
x[1:25,2]=x[1:25,2]-4
```

[3]:
```
km.out=kmeans (x,2, nstart =20)
print(km.out$cluster)
```

```
 [1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1
[39] 1 1 1 1 1 1 1 1 1 1 1 1
```

[4]:
```
plot(x, col=(km.out$cluster +1), main="K-Means Clustering
Results with K=2", xlab="", ylab="", pch=20, cex=2)
```



[5]:
```
set.seed(4)
km.out=kmeans(x,3, nstart =20)
km.out
```

```
K-means clustering with 3 clusters of sizes 12, 13, 25

Cluster means:
        [,1]       [,2]
1  0.6214201 -1.1549043
2 -0.6637831  0.5605657
3  3.2730045 -4.0650217

Clustering vector:
 [1] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 2 1 1 1 1 2 2 2 2 2 2 2
```

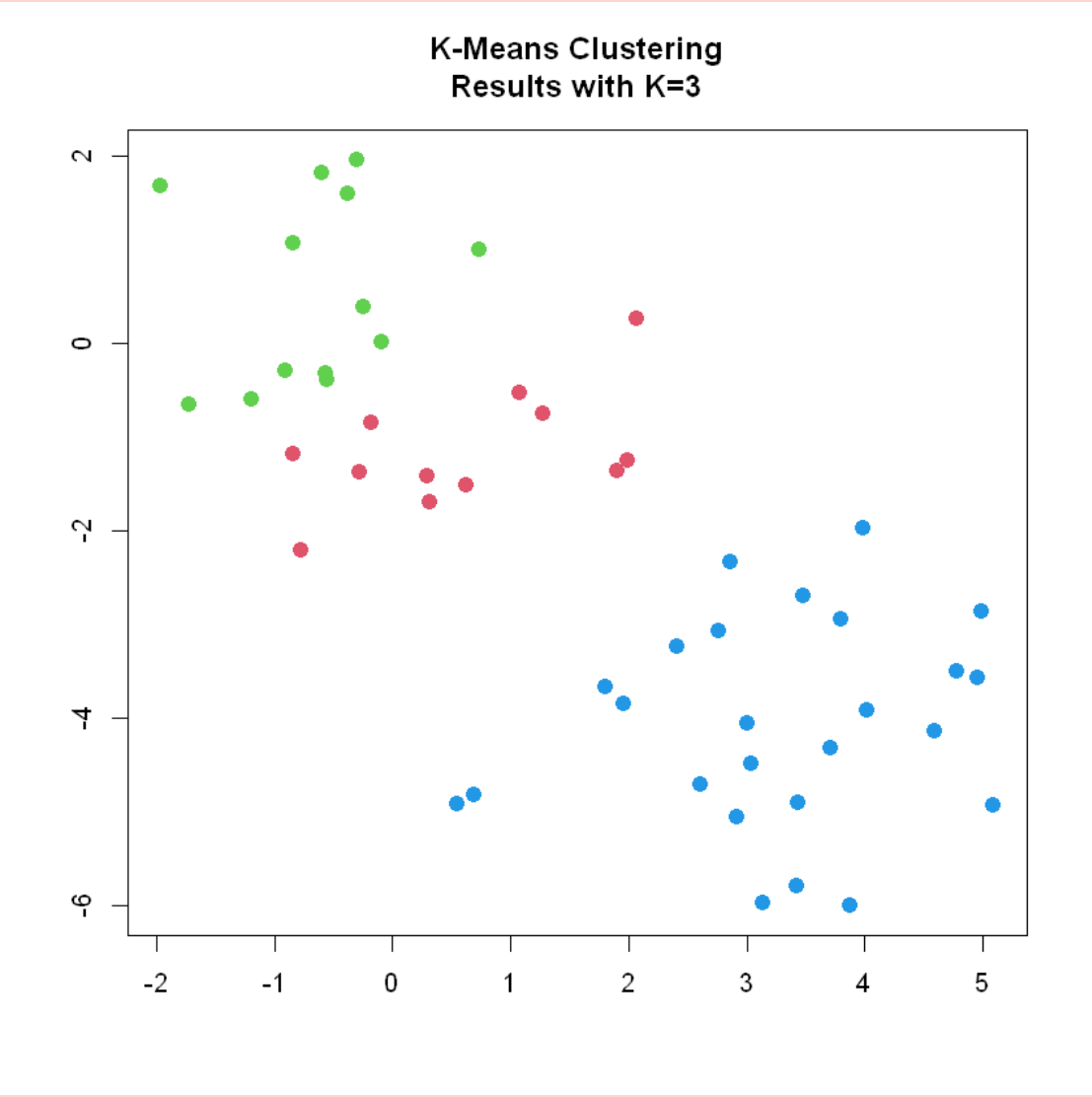
```
[39] 1 1 1 1 2 2 1 2 2 1 2 1

Within cluster sum of squares by cluster:
[1] 16.35329 17.75821 64.06458
 (between_SS / total_SS =  78.0 %)

Available components:

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

[6]:
```
plot(x, col=(km.out$cluster +1), main="K-Means Clustering
Results with K=3", xlab="", ylab="", pch=20, cex=2)
```



[11]:
```
set.seed(3)
km.out=kmeans (x,3, nstart =1)
print(km.out$tot.withinss)
km.out=kmeans (x,3, nstart =20)
print(km.out$tot.withinss)
```

```
[1] 99.98283
[1] 98.17608
```