THE SPARK FOUNDATION TASK 2

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TASK : Predict the optimum number of clusters in the given dataset

Loading the data set

```
data("iris")
summary(iris)
```

```
##   Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
##  Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100
##  1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300
##  Median :5.800   Median :3.000   Median :4.350   Median :1.300
##  Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
##  3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
##  Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
##        Species
##  setosa    :50
##  versicolor:50
##  virginica :50
##
##
##
```

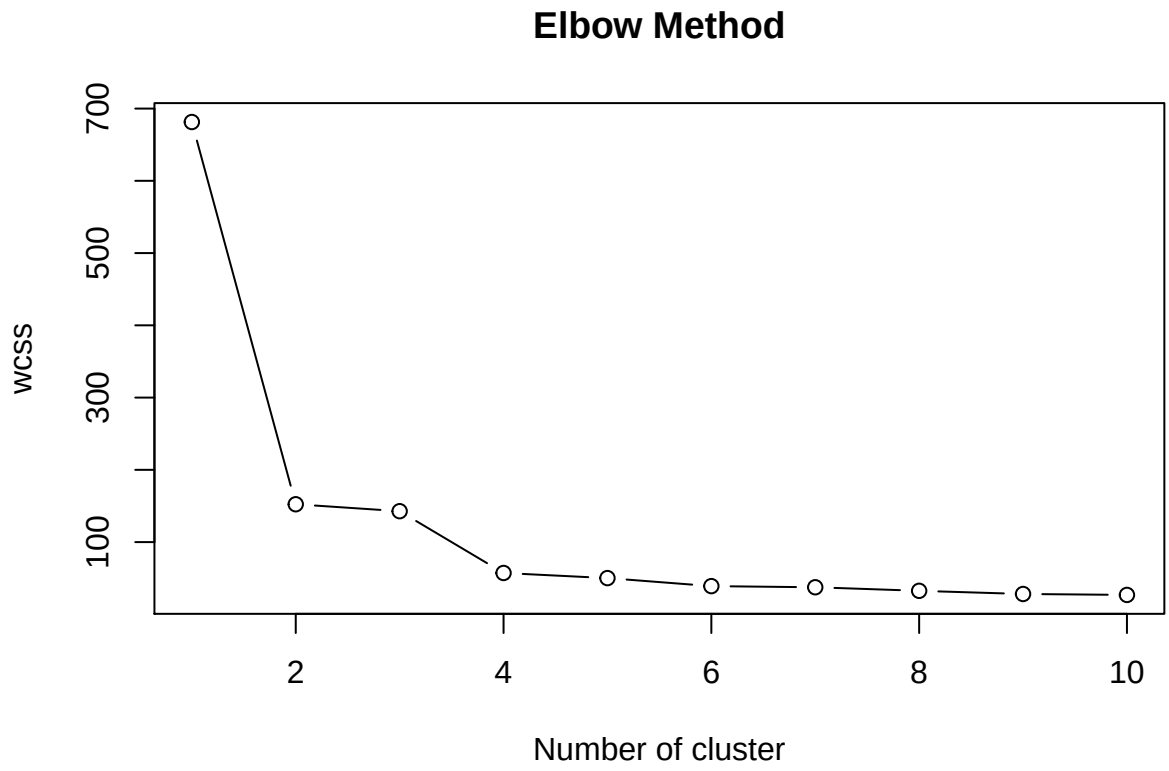
```
head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

Data clustering

```
x = iris[,-5]
y = iris$Species
set.seed(27)
```

```r
#finding the cluster
wcss = vector()
for(i in  1 :10)wcss[i] = sum(kmeans(x,i)$withinss)
plot(1:10,
     wcss,
     type = "b",
     main = "Elbow Method",
     xlab = "Number of cluster",
     ylab = "wcss")
```



Fitting the model

```r
set.seed(27)
kmeans = kmeans(x,centers = 3)
kmeans
```

```
## K-means clustering with 3 clusters of sizes 62, 50, 38
##
## Cluster means:
##   Sepal.Length Sepal.Width Petal.Length Petal.Width
## 1     5.901613    2.748387     4.393548    1.433871
## 2     5.006000    3.428000     1.462000    0.246000
## 3     6.850000    3.073684     5.742105    2.071053
##
## Clustering vector:
##   [1] 2 2 2
```

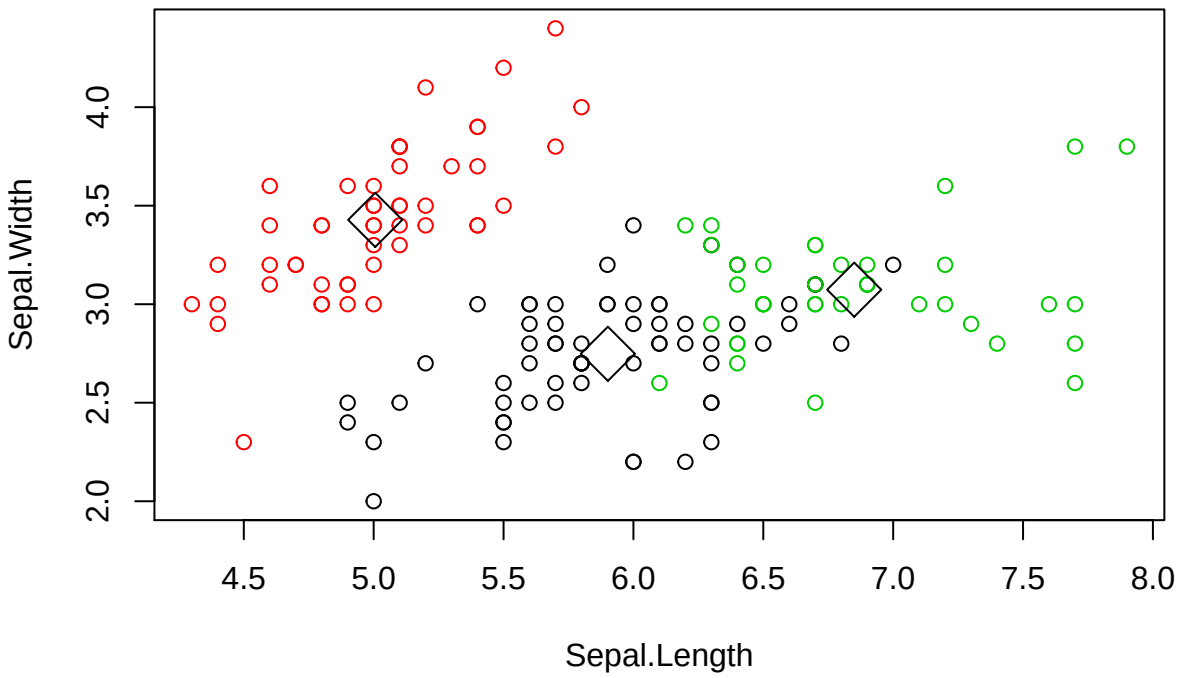
```
##  [38] 2 2 2 2 2 2 2 2 2 2 2 2 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
##  [75] 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 3 1 3 3 3 3 1 3 3 3 3
## [112] 3 3 1 1 3 3 3 3 1 3 1 3 1 3 3 1 1 3 3 3 3 3 1 3 3 3 3 1 3 3 3 1 3 3 3 1 3
## [149] 3 1
##
## Within cluster sum of squares by cluster:
## [1] 39.82097 15.15100 23.87947
##  (between_SS / total_SS =  88.4 %)
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
## [6] "betweenss"    "size"         "iter"         "ifault"
```

```
table(y,kmeans$cluster)
```

```
##
## y             1  2  3
##   setosa      0 50  0
##   versicolor 48  0  2
##   virginica  14  0 36
```

Visualising the cluster

```
plot(x[c("Sepal.Length","Sepal.Width")], col = kmeans$cluster )
points(kmeans$centers[,c("Sepal.Length","Sepal.Width")],col = 1,pch = 23, cex = 3)
```



Concluding , There are 3 cluster in the graph. . .