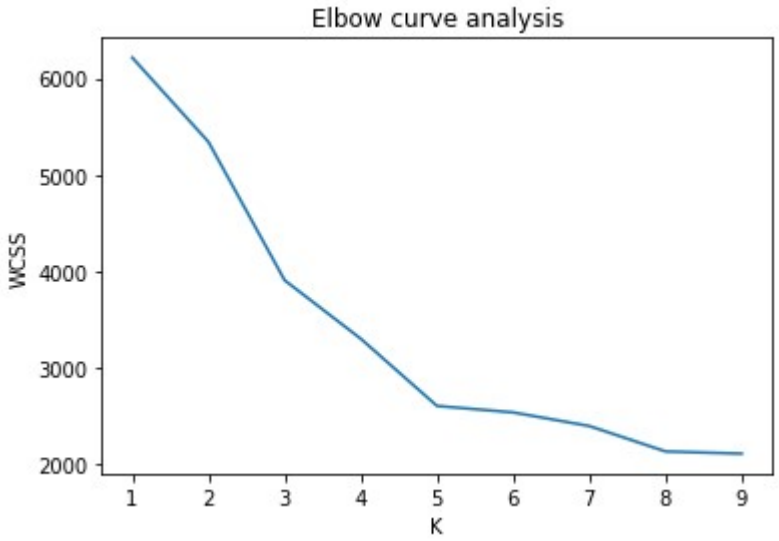
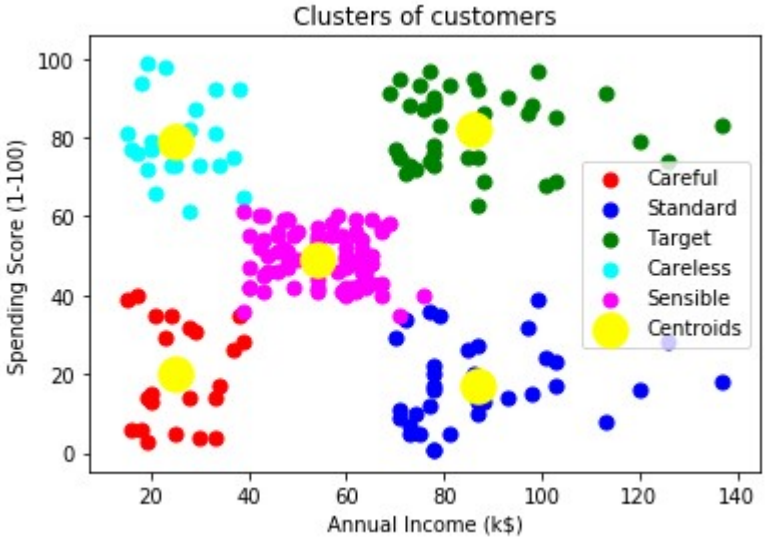
```
Python 3.6.4 |Anaconda custom (64-bit)| (default, Jan 16 2018, 10:22:32) [MSC v.1900 64 bit
(AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.1.0 -- An enhanced Interactive Python.

In [1]:          'C:/Users/Hemanth kumar/Desktop/data_mining/kmeans/Mall_Customers.py'
    ='C:/Users/Hemanth kumar/Desktop/data_mining/kmeans'

Initialization method :k++
Distance measure :Euclidean
K= 1

Converged at iteration 1


Initialization method :k++
Distance measure :Euclidean
K= 2

Converged at iteration 2


Initialization method :k++
Distance measure :Euclidean
K= 3

Converged at iteration 5


Initialization method :k++
Distance measure :Euclidean
K= 4

Converged at iteration 4


Initialization method :k++
Distance measure :Euclidean
K= 5

Converged at iteration 3


Initialization method :k++
Distance measure :Euclidean
K= 6

Converged at iteration 3


Initialization method :k++
Distance measure :Euclidean
K= 7

Converged at iteration 4


Initialization method :k++
```

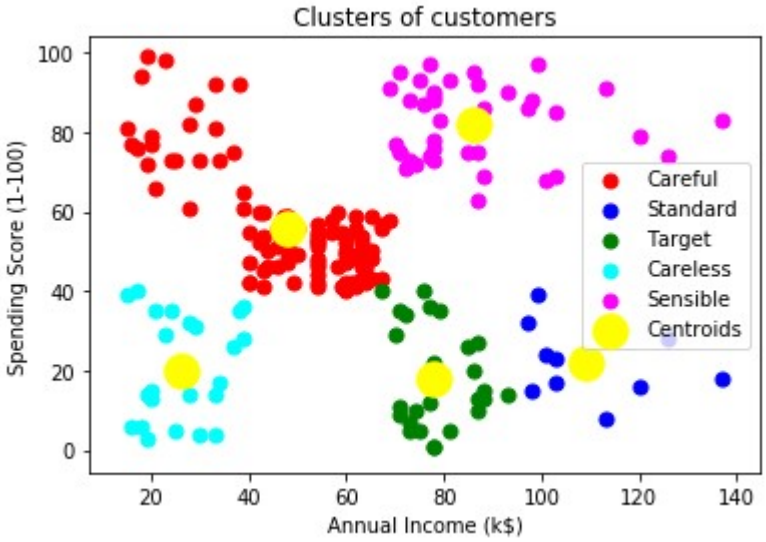
```
Distance measure :Euclidean
K= 8

Converged at iteration 9


Initialization method :k++
Distance measure :Euclidean
K= 9

Converged at iteration 8

######################       Elbow analysis       ##############################
```




```
######################   use different init method   ##############################

Initialization method :K++
Distance measure :Euclidean
K= 5

Converged at iteration 4

centroids :
 [[25 20]
 [87 17]
 [86 82]
 [25 79]
 [54 49]]
cluster member count :
 [22, 36, 39, 22, 81]
WCSS:
 [[2600.421186339183, 5]]
```

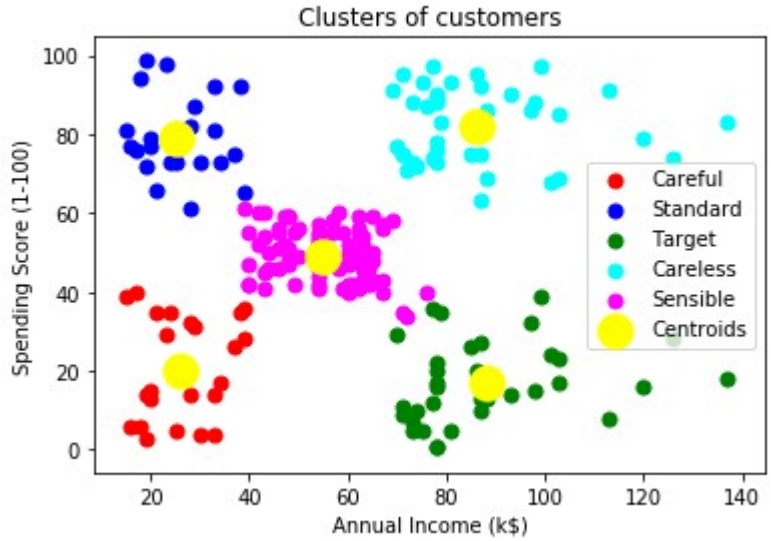


```
Initialization method :random
Distance measure :Euclidean
K= 5

Converged at iteration 7

centroids :
 [[ 48  56]
 [109  22]
 [ 78  18]
 [ 26  20]
 [ 86  82]]
cluster member count :
 [99, 10, 29, 23, 39]
WCSS:
 [[3128.332222366909, 5]]
```

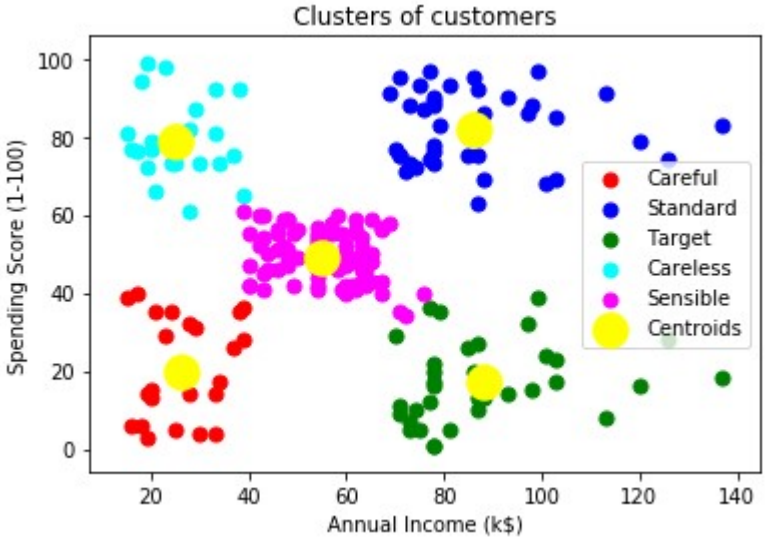


```
Initialization method :1st k
```

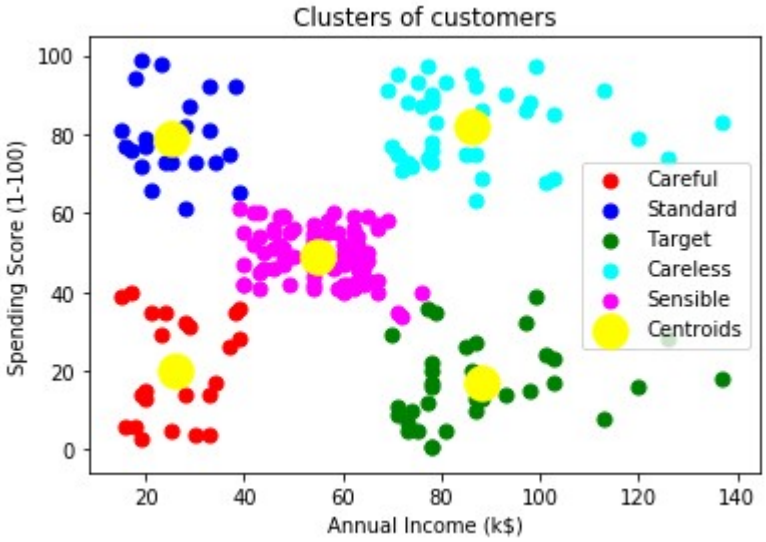
```
Distance measure :Euclidean
K= 5

Converged at iteration 3

centroids :
 [[26 20]
 [25 79]
 [88 17]
 [86 82]
 [55 49]]
cluster member count :
 [23, 22, 35, 39, 81]
WCSS:
 [[2600.012523991302, 5]]
```




```
------------------------------------------------------------
########################    use different distance measure   ########################

Initialization method :k++
Distance measure :Manhattan
K= 5

Converged at iteration 8

centroids :
 [[26 20]
 [86 82]
 [88 17]
 [25 79]
 [55 49]]
cluster member count :
 [23, 39, 35, 22, 81]
WCSS :
 [[3343.0, 5]]
```

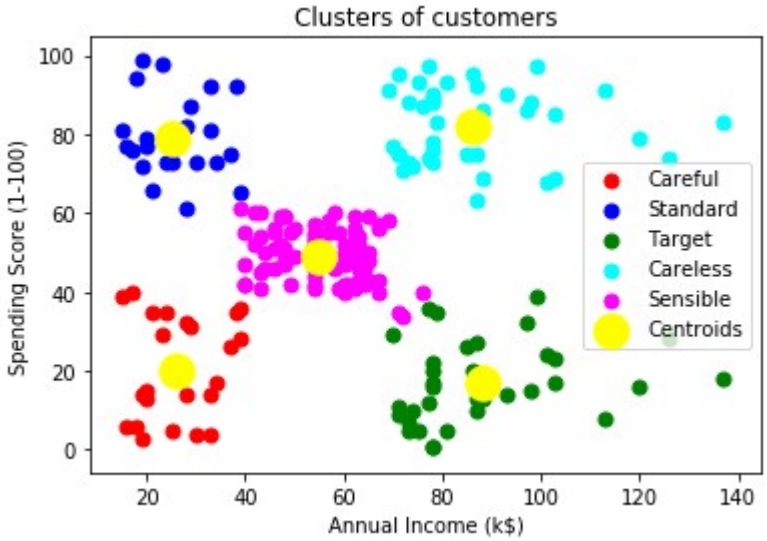


```
Initialization method :k++
Distance measure :Euclidean
K= 5

Converged at iteration 3

centroids :
 [[26 20]
 [25 79]
 [88 17]
 [86 82]
 [55 49]]
cluster member count :
 [23, 22, 35, 39, 81]
WCSS :
 [[2600.012523991302, 5]]
```



```
Initialization method :k++
```

```
Distance measure :Minkowski
K= 5

Converged at iteration 5

centroids :
 [[26 20]
 [25 79]
 [88 17]
 [86 82]
 [55 49]]
cluster member count :
 [23, 22, 35, 39, 81]
WCSS :
 [[2445.0288053334693, 5]]
```



In [2]: