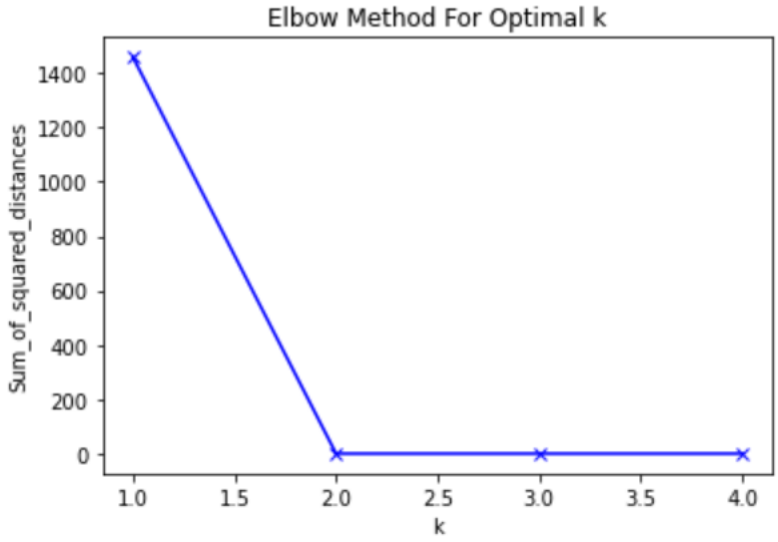
Cmpe58y – Hw6 Affordance Learning Report – Ömer Faruk Özdemir – 03.06.2020

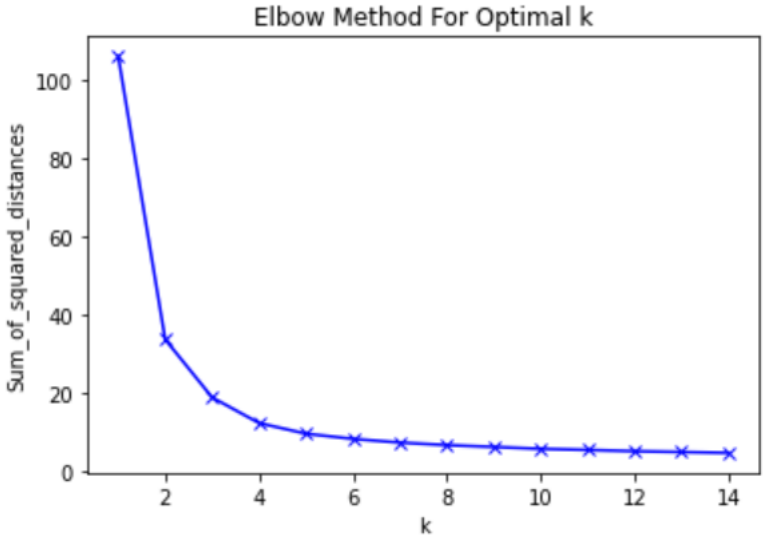
Behaviour0:

Elbow Method Graphs:

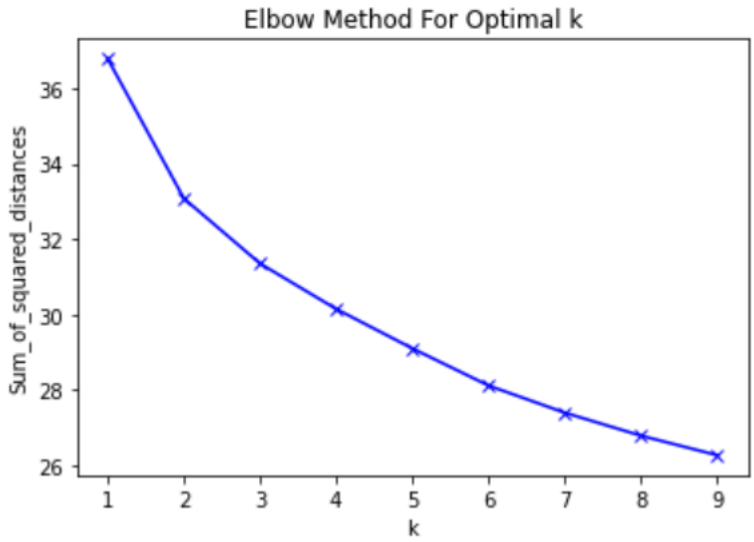
Channel0:



Channel1:



Channel3:



Classification Accuracies:

Selected cluster dimensions as (2,3,3) and (2,4,4) from the elbow method plots.

(2,3,3) gave %60 accuracy

(2,4,4) gave %45 accuracy

Note that my code is dynamic, and cluster nos can be changed from this part:

```
In [8]: numberOfClusterList[0]=2
        numberOfClusterList[1]=3
        numberOfClusterList[2]=3
        print("Cluster dimensions:",numberOfClusterList)
```

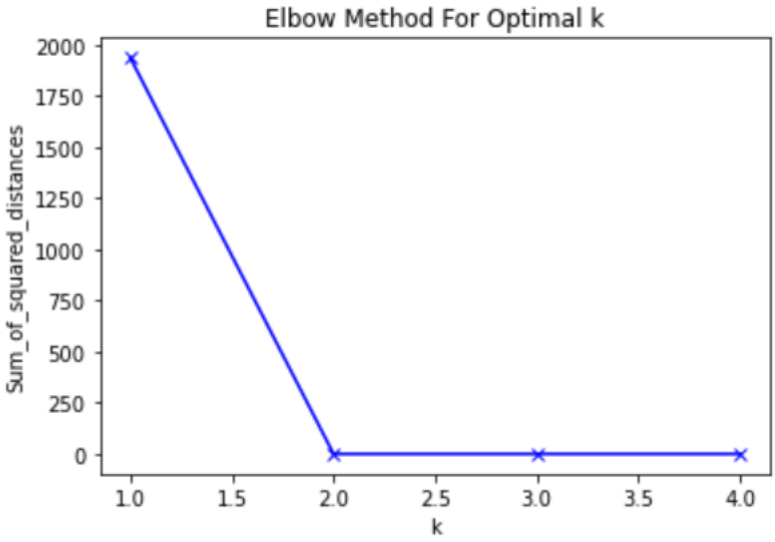
Best Cluster Dimension: (2,3,3)

```
Channel 0 Cluster Centers:
 [[ 1.16018306e-14]
 [-1.00000000e+00]]

Channel 1 Cluster Centers:
 [[-5.05590059e-04 -3.64283271e-04 -9.13859300e-04  1.94587440e-03
   1.28412121e-01  1.23480904e-01]
 [-3.69663531e-04 -2.48359986e-04  1.63737337e-04  1.67542692e-04
   1.27715991e-04  1.40485528e-04]
 [-2.03870210e-01 -1.55984124e-01  1.15240676e-01  1.16283124e-01
  -1.64803790e-01 -1.64762857e-01]]

Channel 2 Cluster Centers:
 [[ 1.47419587e-02 -1.39740812e-03 -6.33482012e-03 -4.25519439e-03
    9.92533849e-04  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00 -4.18151515e-04 -1.57691038e-03
   -1.47424113e-03 -2.77772727e-04  6.69529207e-03  6.73251838e-03
   -1.27564729e-02 -8.52267376e-03  5.18290200e-03  4.97364958e-03
   -8.20722115e-04  4.61062540e-04 -9.95239845e-04 -9.50294649e-04
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]
 [-1.83525619e-03  1.28689293e-03 -1.38232701e-03 -1.39574258e-03
    1.47607128e-03  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00 -4.27459162e-04 -6.47493117e-04
   -2.77977975e-05  2.95312603e-03 -8.59050474e-04 -2.72821673e-03
    3.69389324e-03  2.27717161e-03 -1.53922040e-03 -1.54030743e-03
    5.33687519e-04  1.27644387e-03 -5.47944173e-04 -5.66456562e-04
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]
 [ 2.17985554e-03  7.23488079e-04 -2.90100421e-03  9.96475456e-04
    2.11975877e-03  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  5.84455820e-04  2.04978962e-04
   -1.32546844e-03 -2.58252454e-03  2.57852875e-03 -1.56208906e-02
   -3.90171627e-02 -2.92228934e-02  8.44102525e-03  4.58996858e-02
    2.35868359e-02  4.47351192e-03 -3.67513324e-04 -7.51124825e-04
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
    0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]]

3d labels:
 [[1. 1. 1.]
 [1. 1. 1.]
 [0. 0. 1.]
 ...
 [0. 0. 1.]
 [0. 0. 0.]
 [0. 0. 1.]]

1d Labels:
 [13. 13.  1. ...  1.  0.  1.]
```

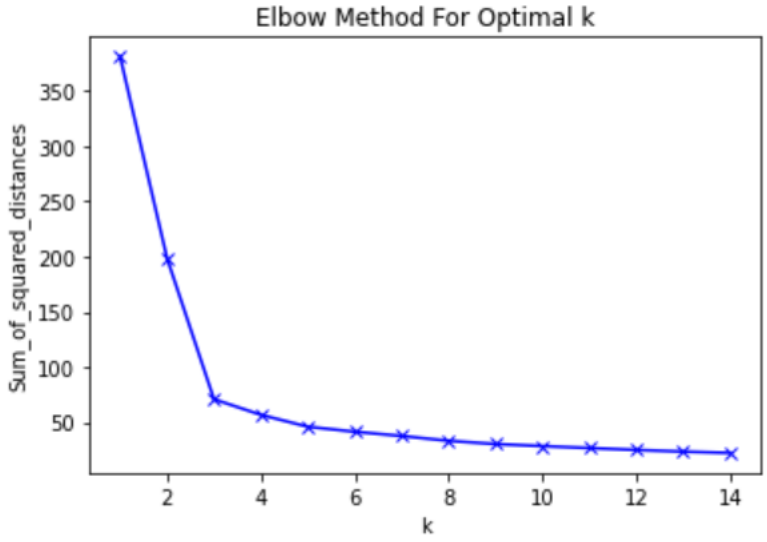
Behaviour1:

Elbow Method Graphs:

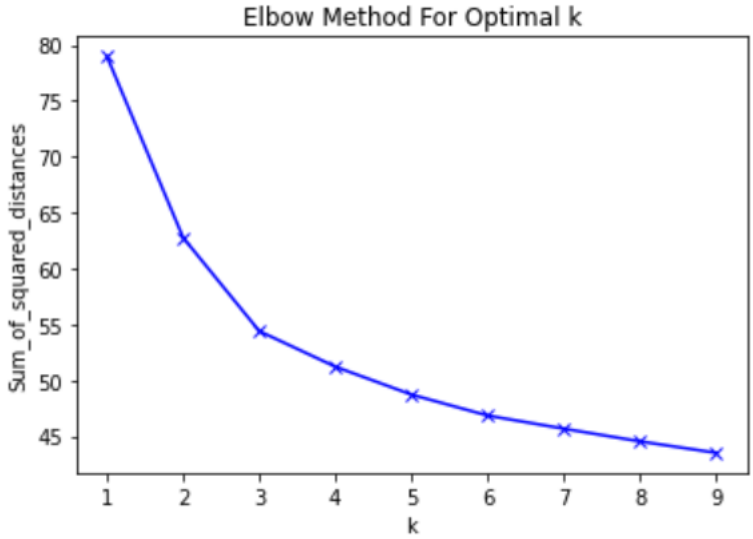
Channel0:



Channel1:



Channel3:



Classification Accuracies:

Selected cluster dimensions as (2,3,3) and (2,4,4) from the elbow method plots.

(2,3,3) gave %71 accuracy

(2,4,4) gave %64 accuracy

Note that my code is dynamic, and cluster nos can be changed from this part:

```
In [8]: numberOfClusterList[0]=2
        numberOfClusterList[1]=3
        numberOfClusterList[2]=3
        print("Cluster dimensions:",numberOfClusterList)
```

Best Cluster Dimension: (2,3,3)

```
Channel 0 Cluster Centers:
 [[-2.97539771e-14]
 [-1.00000000e+00]]

Channel 1 Cluster Centers:
 [[ 1.89944079e-01  2.00557069e-01  6.22461059e-02  6.64604100e-02
   7.01228412e-02  7.49659103e-02]
 [-4.69761881e-03 -3.44176764e-03  5.03887153e-04  3.03903475e-04
  -1.98760670e-03 -1.12494314e-03]
 [-2.84552550e-03  1.15466289e-04  1.75454176e-01  1.84447906e-01
   9.88061405e-02  1.00553120e-01]]

Channel 2 Cluster Centers:
 [[ 6.15223841e-03 -1.23379236e-02 -1.33183743e-02 -2.86602861e-02
  -2.74650914e-02  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  1.96973873e-03  1.37598570e-02
   3.00232371e-02  2.98765820e-02  8.61510124e-03  2.32805859e-02
   1.93529530e-02  4.13101176e-03 -1.49416904e-02 -2.19099641e-02
  -1.48485872e-02 -4.72371457e-03  1.34859569e-05  1.03080274e-03
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]
 [-3.82522478e-02 -1.92074076e-02  1.34068772e-02  5.32590902e-02
   3.69405207e-02  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  1.78258370e-03 -7.23358696e-04
  -1.49805207e-02 -3.22255554e-02 -3.84162152e-02 -6.30526880e-02
  -3.16089793e-02 -7.32095761e-03  1.31240141e-02  3.12271891e-02
   4.03320196e-02  3.25667228e-02  1.81060185e-02  5.04287391e-03
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]
 [-2.87967200e-03 -1.62127260e-03  9.71386185e-04  2.48687541e-03
  -7.00374247e-04  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  4.17190079e-04  1.37906595e-03
   1.21744981e-03 -1.27065172e-03 -1.47912181e-03 -3.49424699e-03
  -2.71403755e-03 -2.15569854e-03 -8.93007302e-04  8.50998261e-04
   2.86138468e-03  3.81372937e-03  2.45844240e-03  7.51571511e-04
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00
   0.00000000e+00  0.00000000e+00  0.00000000e+00  0.00000000e+00]]

3d labels:
 [[0. 0. 0.]
 [0. 2. 2.]
 [0. 1. 2.]
 ...
 [0. 1. 2.]
 [0. 2. 2.]
 [1. 1. 2.]]

1d Labels:
 [ 0.  8.  5. ...  5.  8. 14.]
```