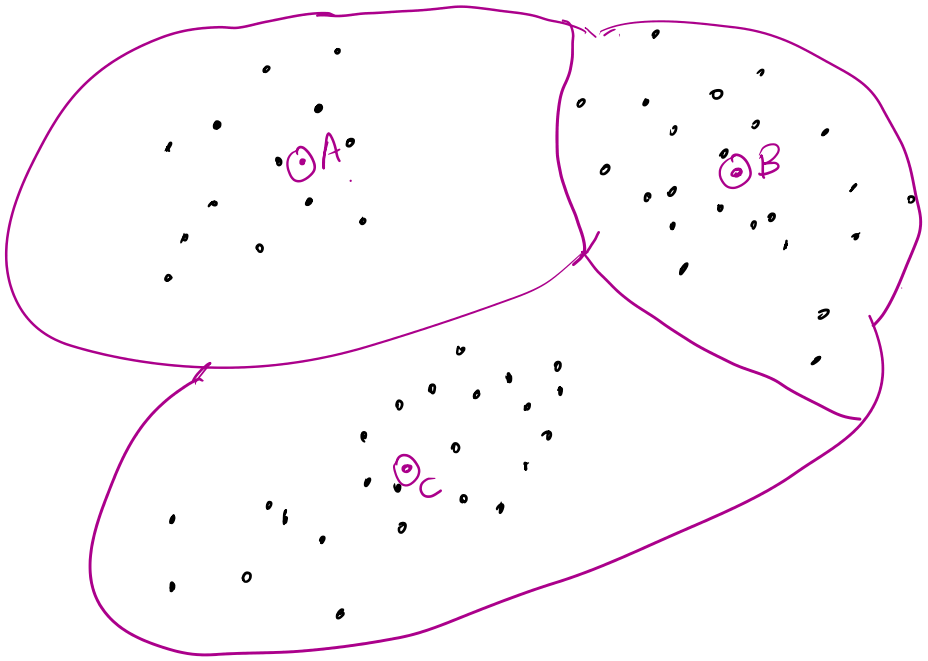
K-Means

Monday, June 5, 2023 10:30 AM

S.No.	X1	X2	X3
1	100	234	20
2	203	450	60
3	95	250	24
4	240	500	70

$A(x_1, y_1)$ $B(x_2, y_2)$

$$d(A,B) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$



X_1	X_2

$k = 3$

$x_1 y_1$ $x_2 y_2$ $x_3 y_3$ $x_4 y_4$

Centroid C

$$\left(\frac{x_1 + x_2 + x_3 + x_4}{4}, \frac{y_1 + y_2 + y_3 + y_4}{4} \right)$$

S.No.	X1	X2	X3

```
In [46]:
    ...: scaler = MinMaxScaler()
```

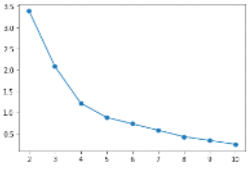
S.No.	X1	X2	X3
1	100	78	0.3
2	90	87	1.4
3	200	90	0.4
4	190	100	1.9

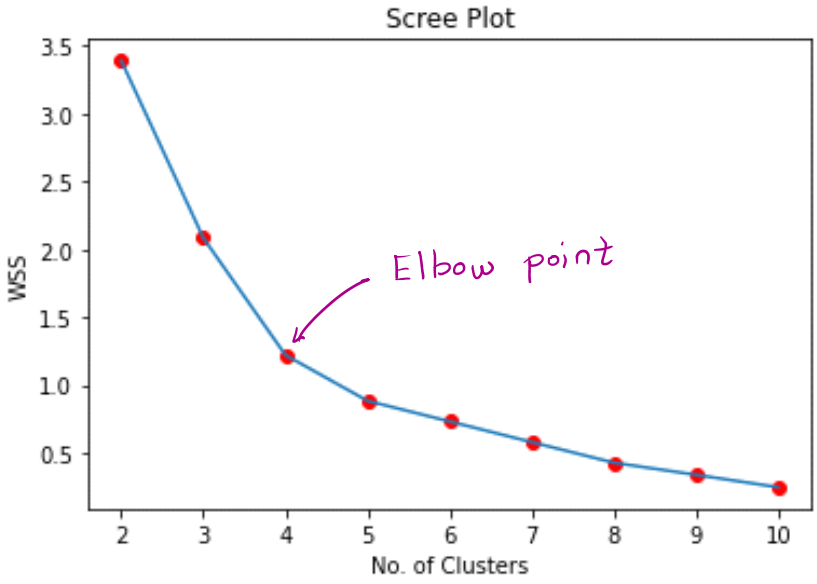
```
In [46]:
    ...: scaler = MinMaxScaler()
    ...: scaler.fit_transform(data)
Out[46]:
array([[0.09090909, 0.        , 0.        ],
       [0.        , 0.40909091, 0.6875    ],
       [1.        , 0.54545455, 0.0625    ],
       [0.90909091, 1.        , 1.        ]])
```

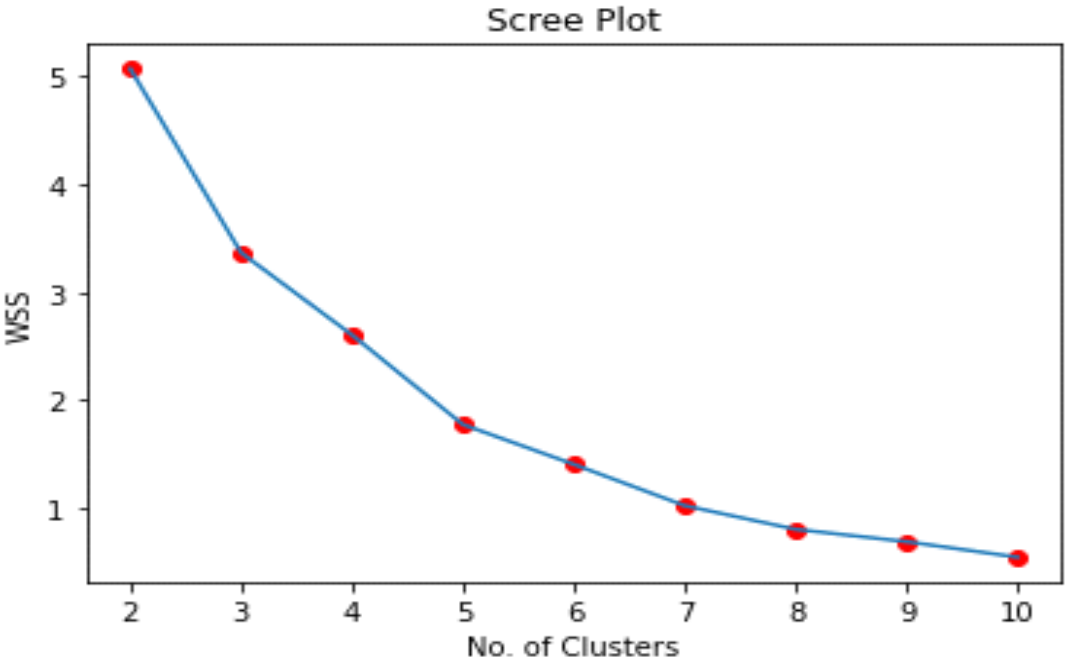
$$d(1,3) = \sqrt{(100-90)^2 + (78-87)^2 + (0.3-1.4)^2}$$

$(X-min)/(max-min)$

100	$(100-90)/(200-90)$	$= 10/110$
90	$(90-90)/(200-90)$	$= 0$
200	$(200-90)/(200-90)$	$= 1$
190	$(190-90)/(200-90)$	$= 100/110$
min	90	
max	200	






Scree Plot
WSS
No. of Clusters
1
2
3
4
5
2
3
4
5
6
7
8
9
10