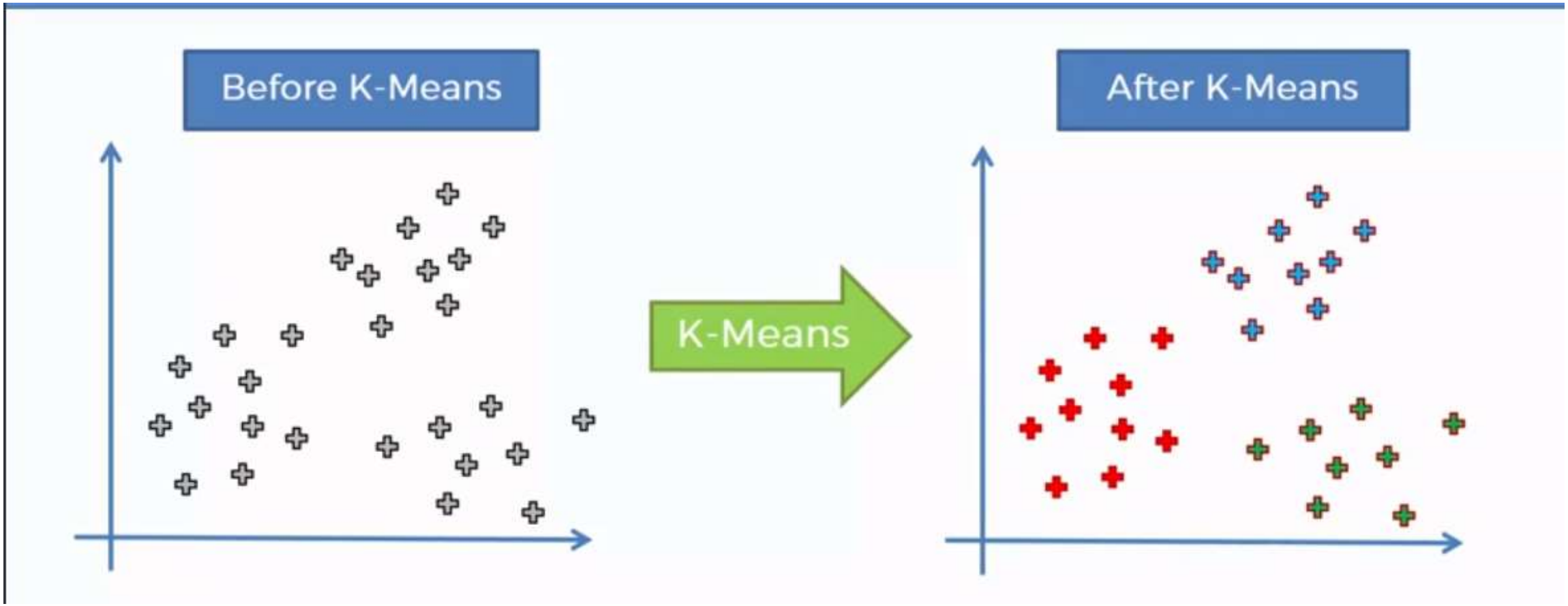
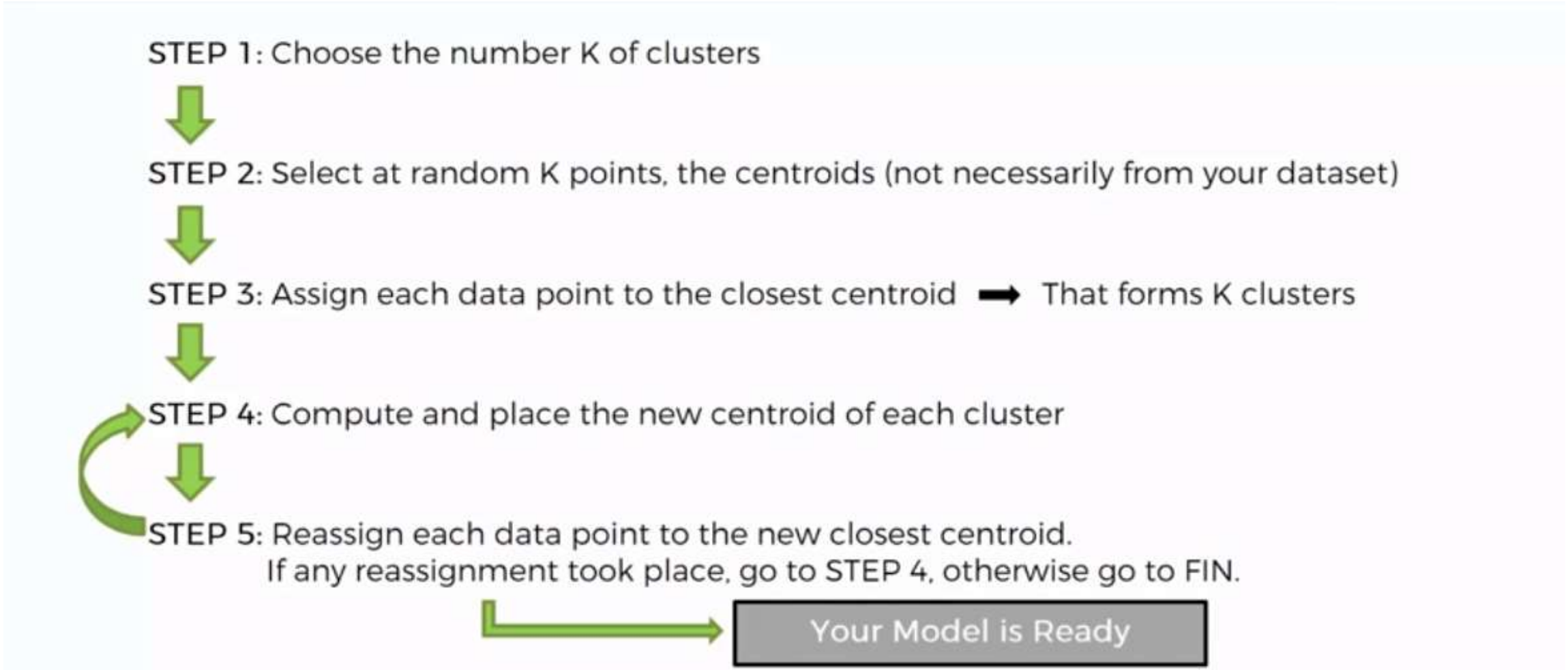
K-Means Clustering

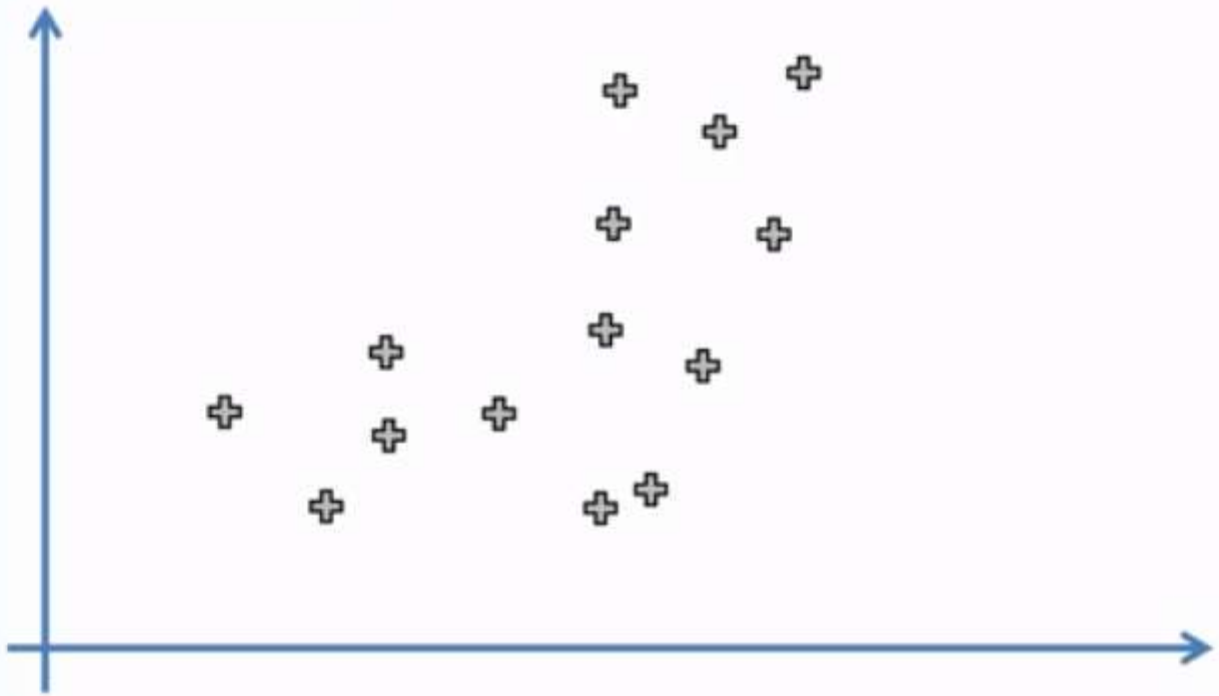


Sensitivity: Internal & Restricted



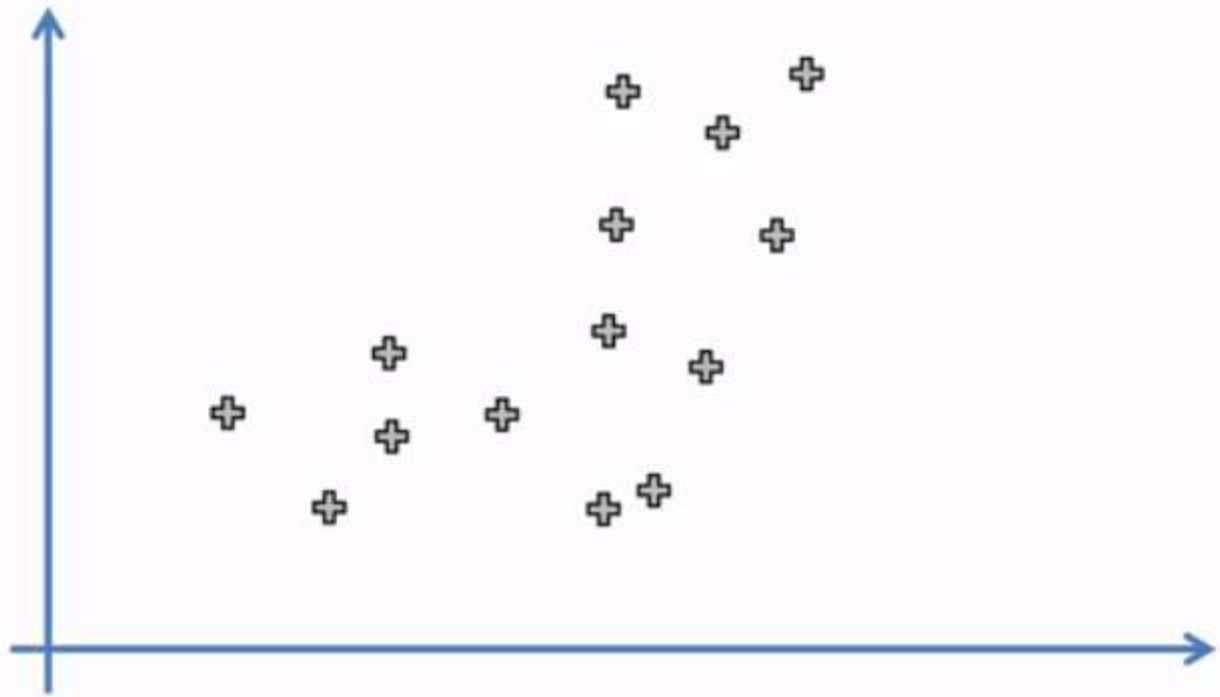
Sensitivity: Internal & Restricted

STEP 1: Choose the number K of clusters: K = 2



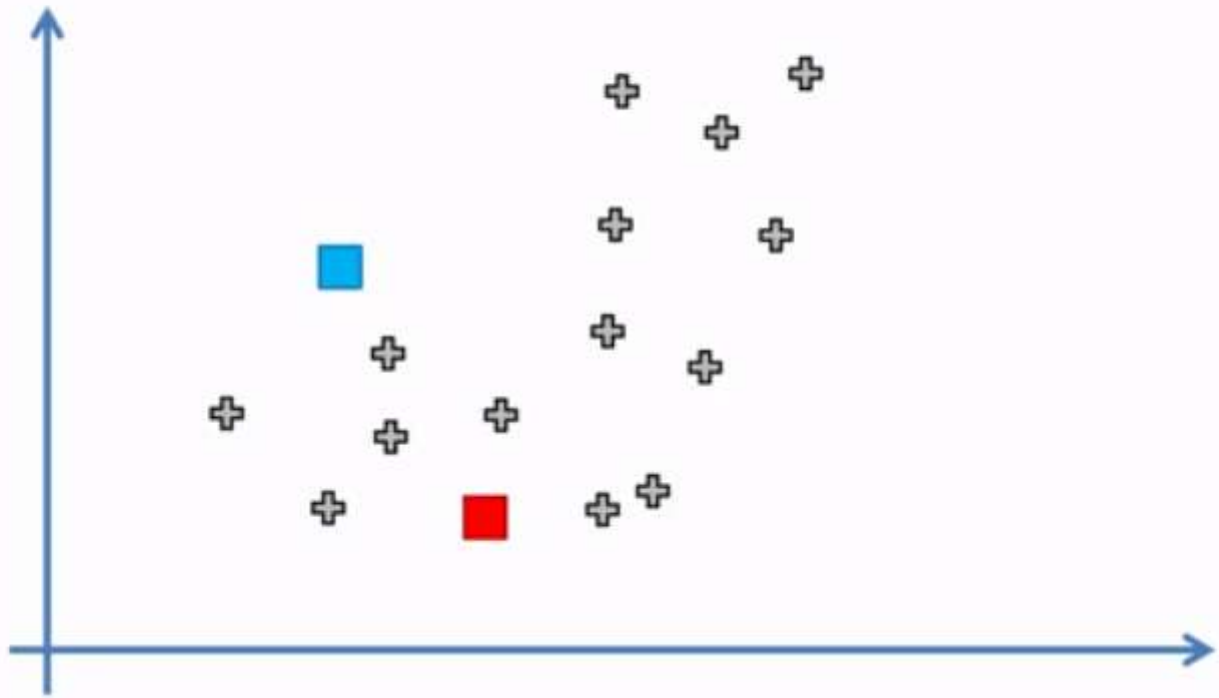
Sensitivity: Internal & Restricted

STEP 2: Select at random K points, the centroids (not necessarily from your dataset)



Sensitivity: Internal & Restricted

STEP 3: Assign each data point to the closest centroid ➡ That forms K clusters



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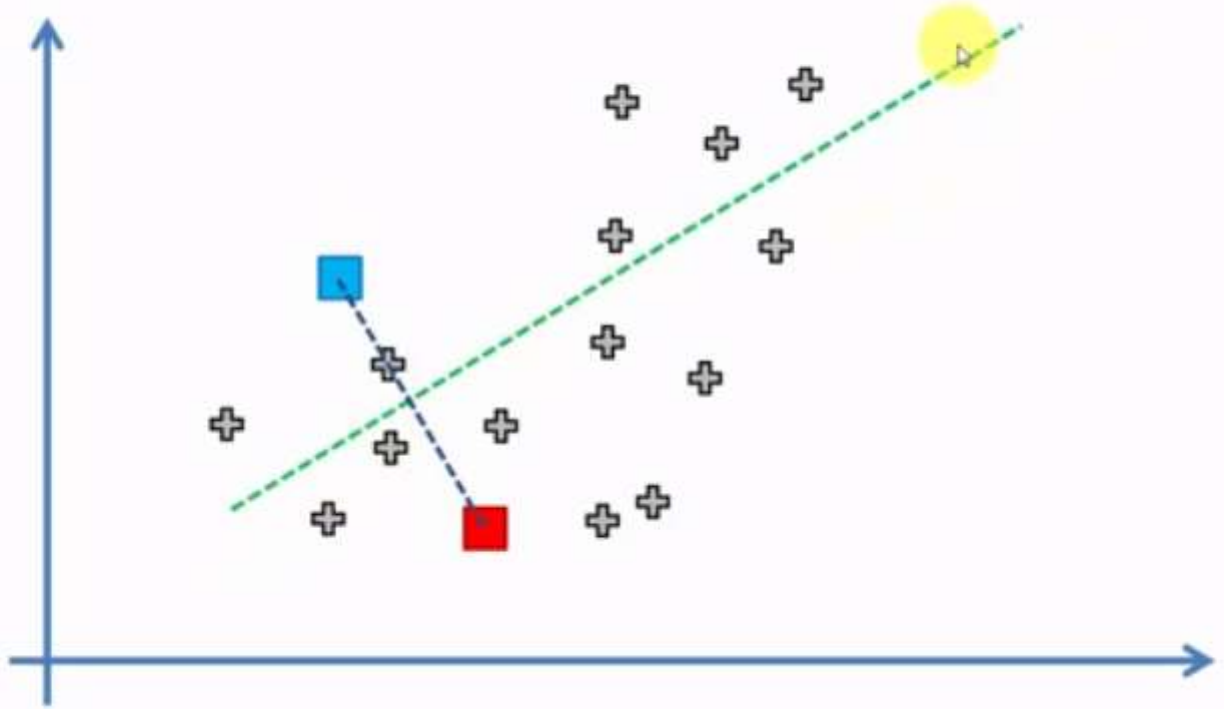

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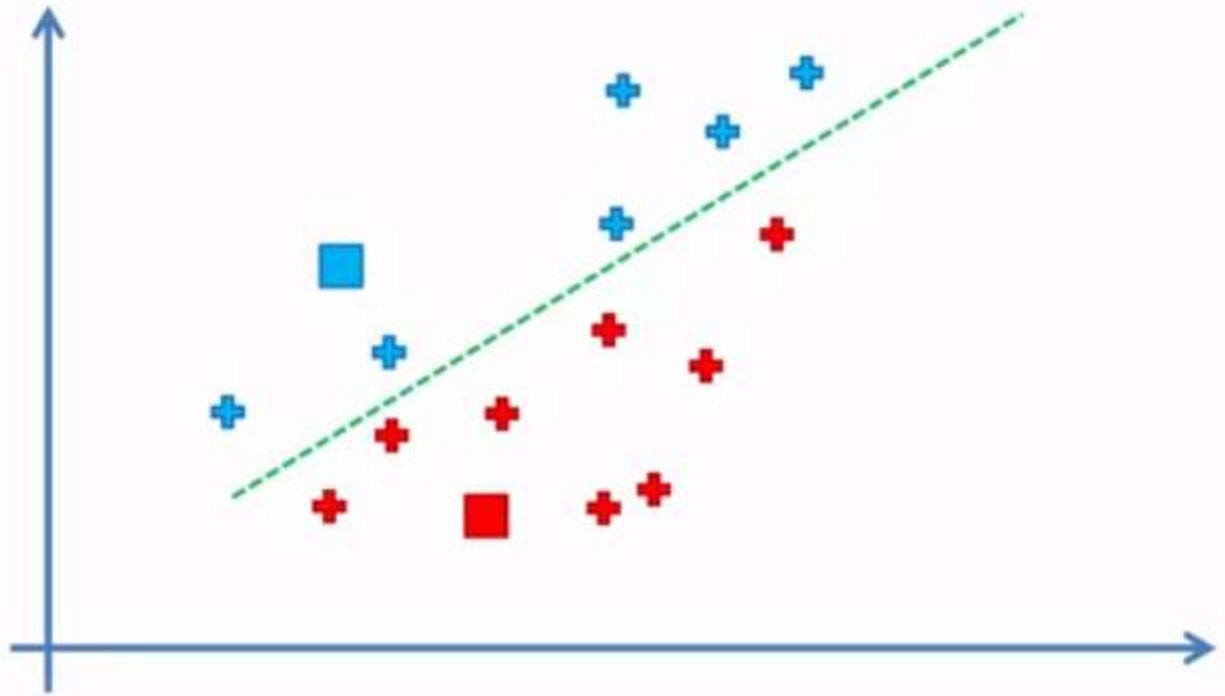
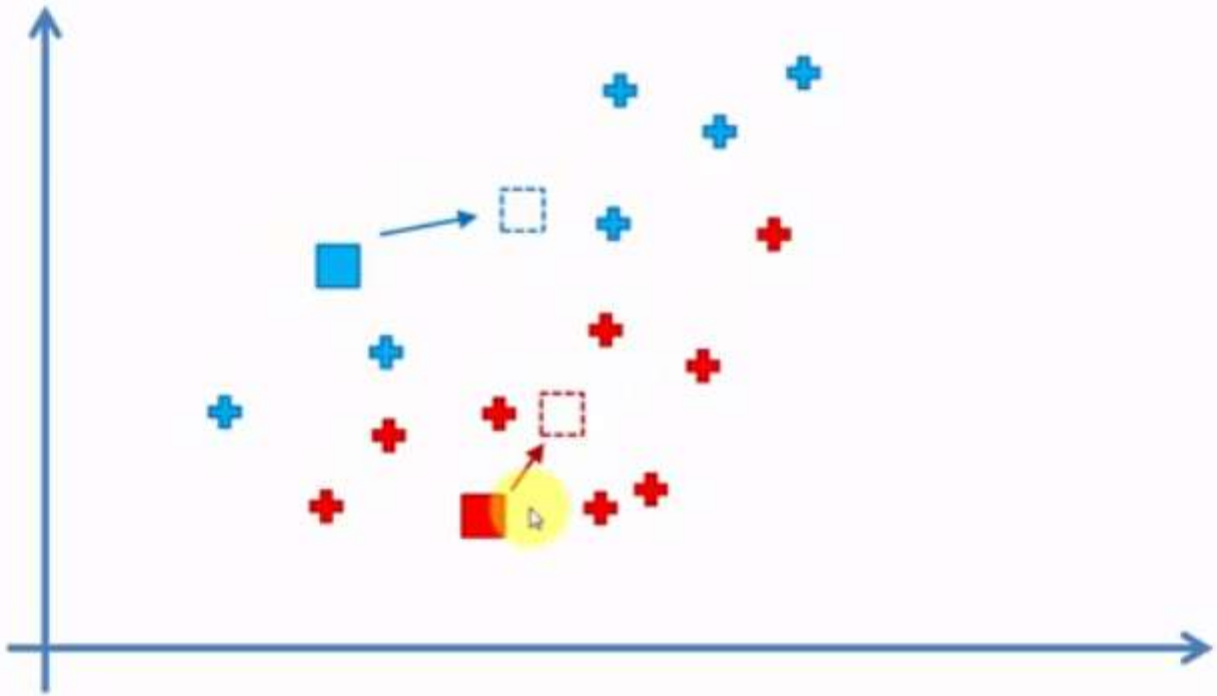


Sensitivity: Internal & Restricted

STEP 4: Compute and place the new centroid of each cluster



Sensitivity: Internal & Restricted

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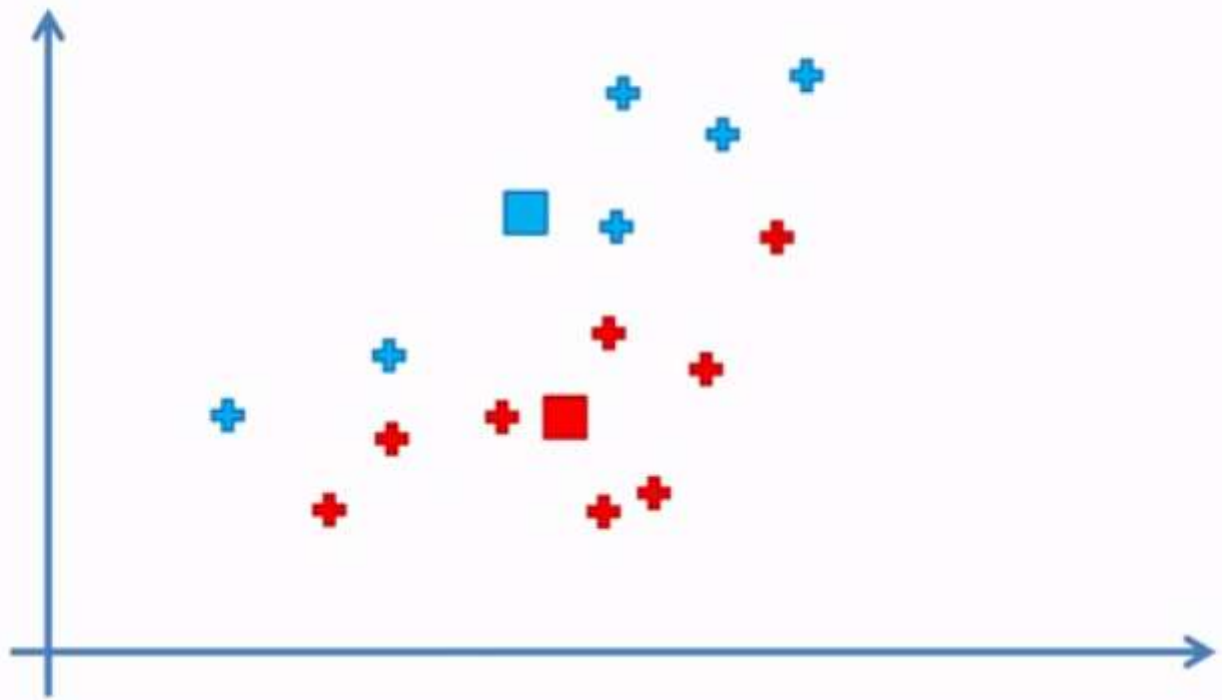
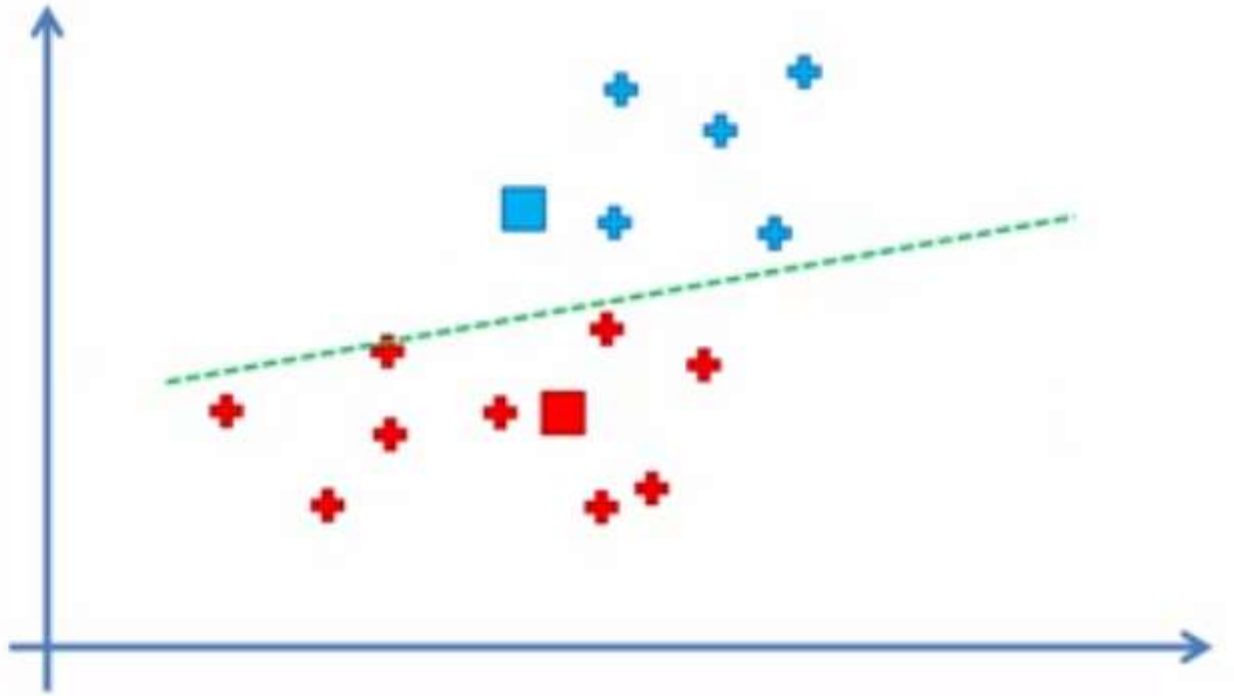


Sensitivity: Internal & Restricted

STEP 5: Reassign each data point to the new closest centroid.
If any reassignment took place, go to STEP 4, otherwise go to FIN.



Sensitivity: Internal & Restricted

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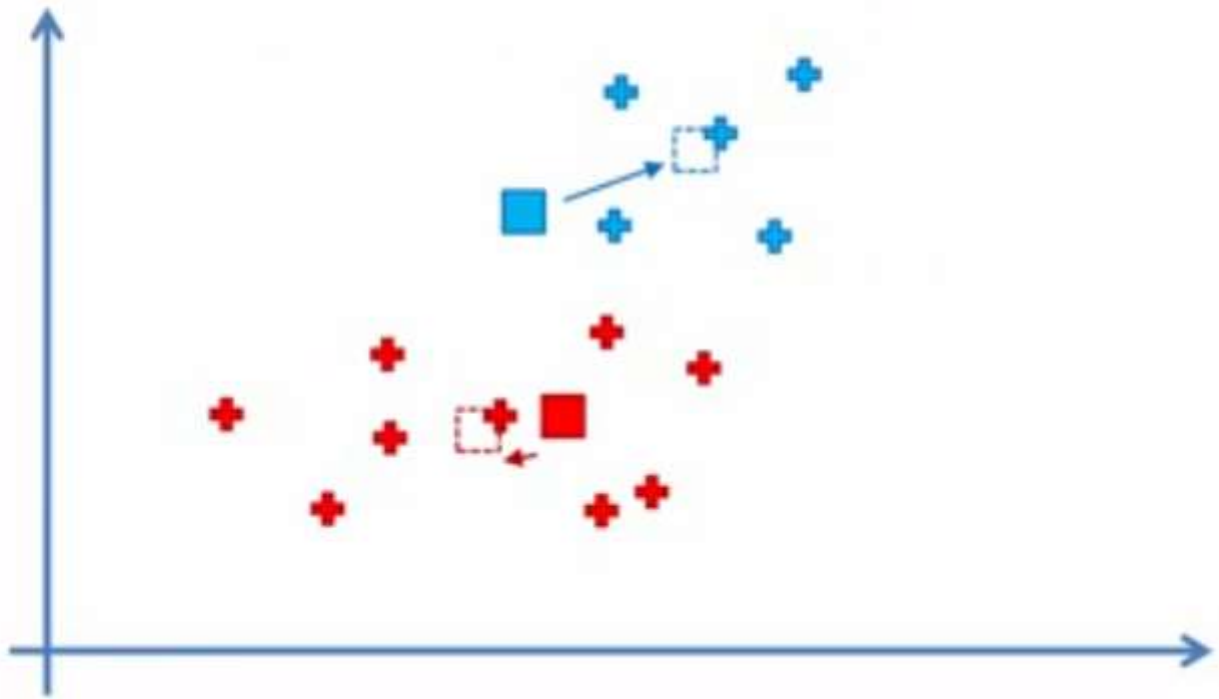

Sensitivity: Internal & Restricted

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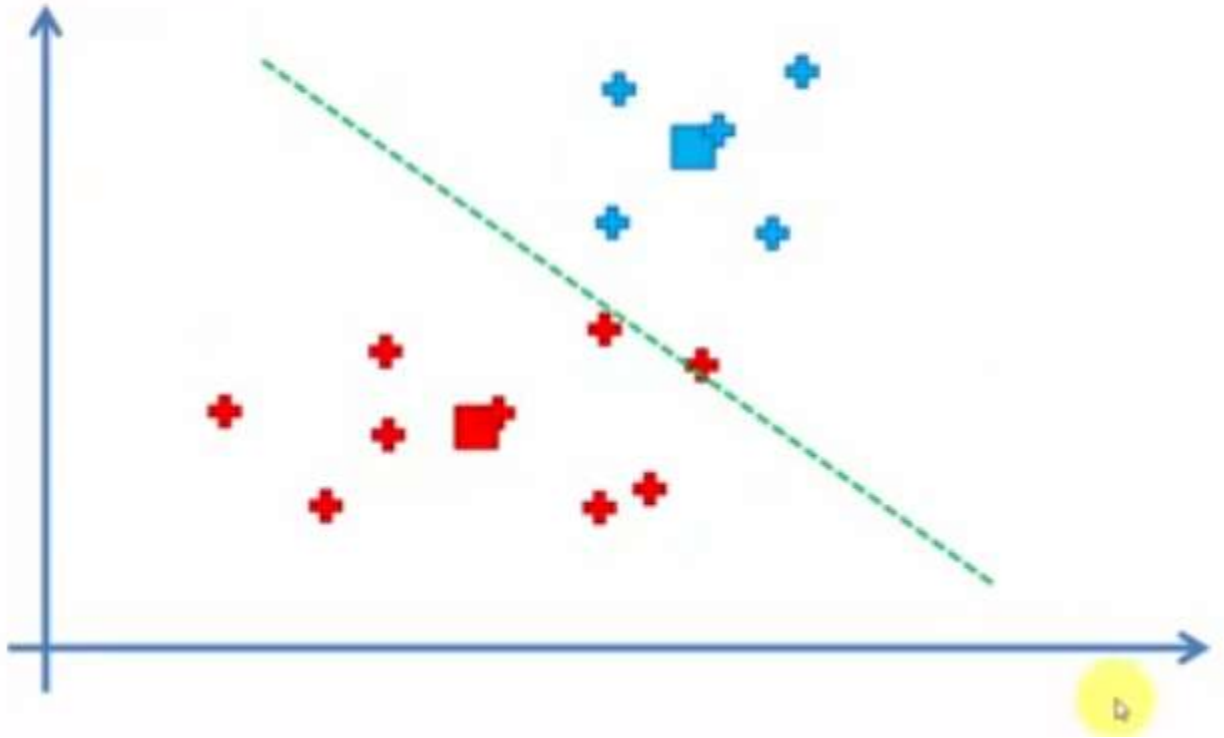

Sensitivity: Internal & Restricted

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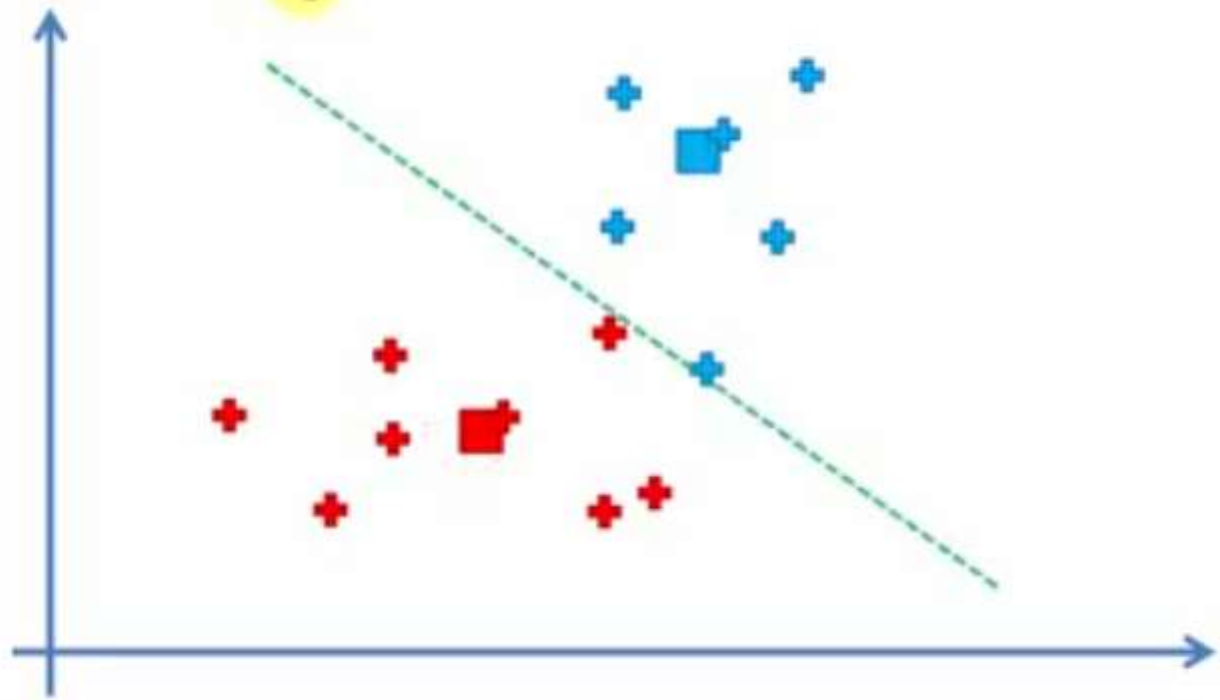

Sensitivity: Internal & Restricted

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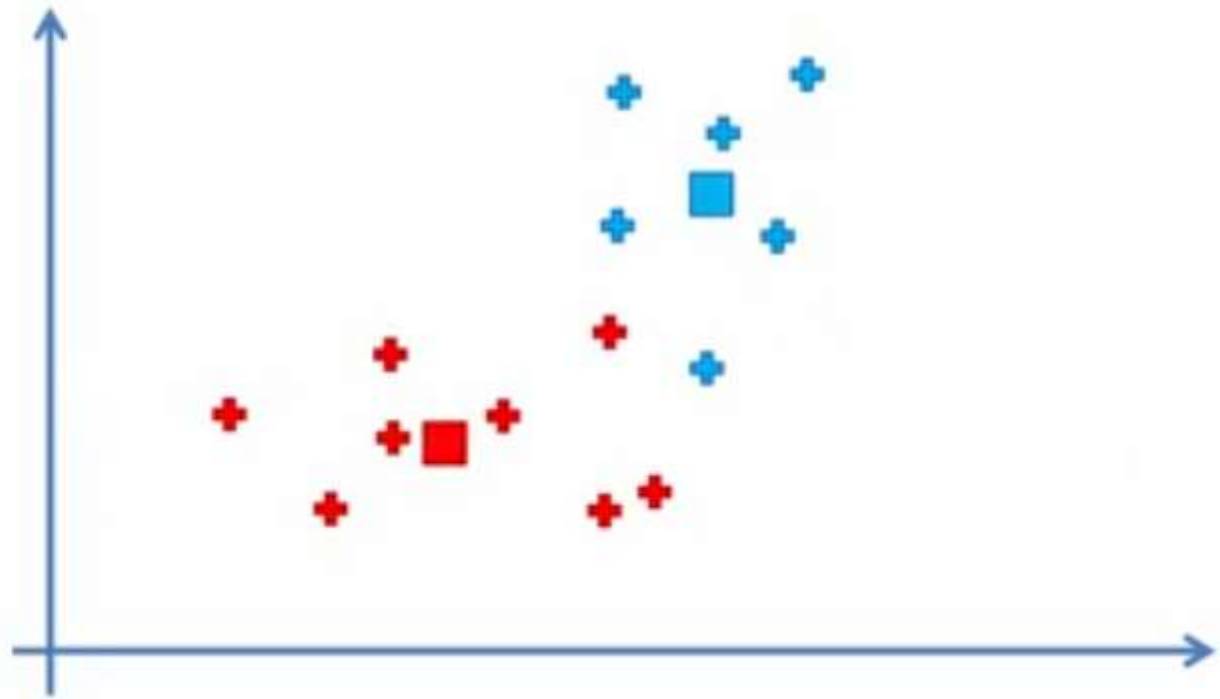

Sensitivity: Internal & Restricted

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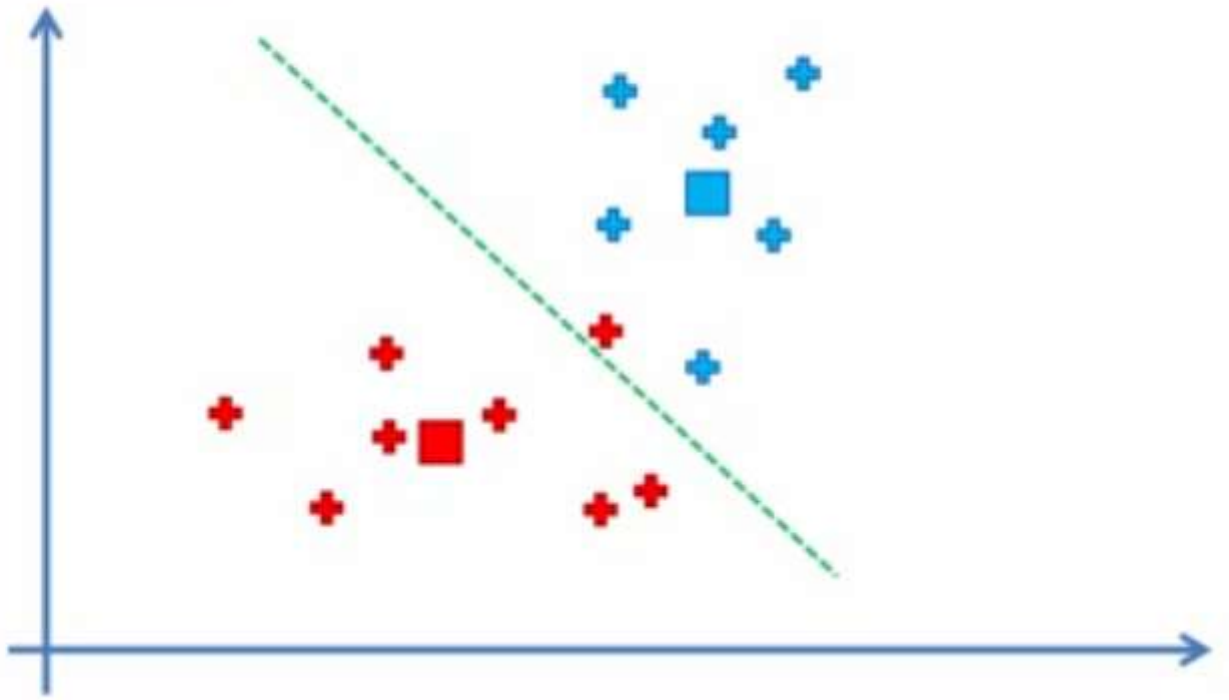

Sensitivity: Internal & Restricted

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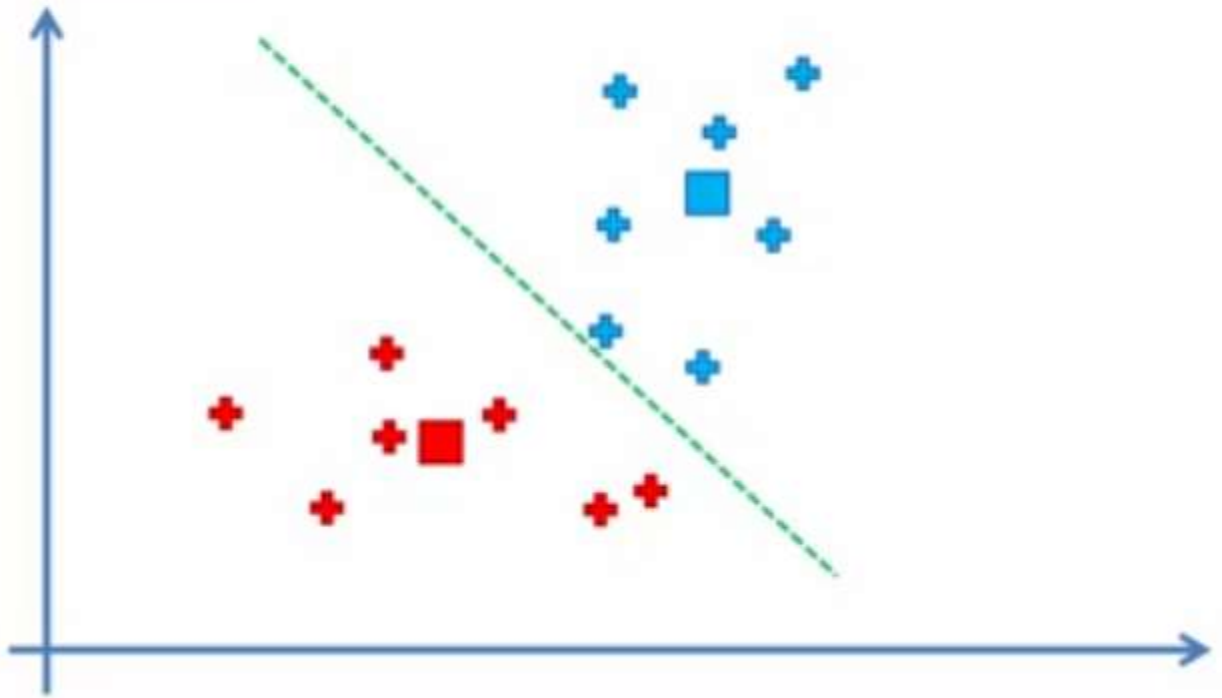

Sensitivity: Internal & Restricted

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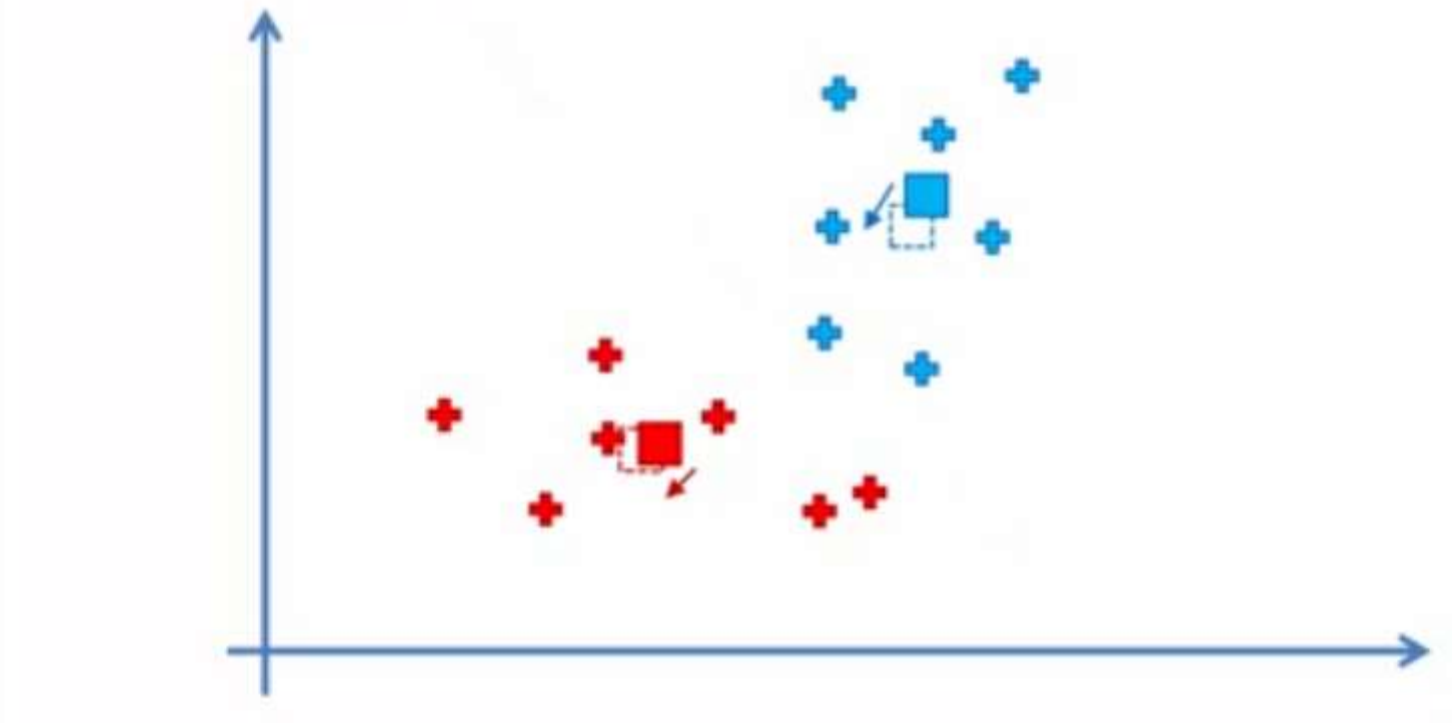

Sensitivity: Internal & Restricted

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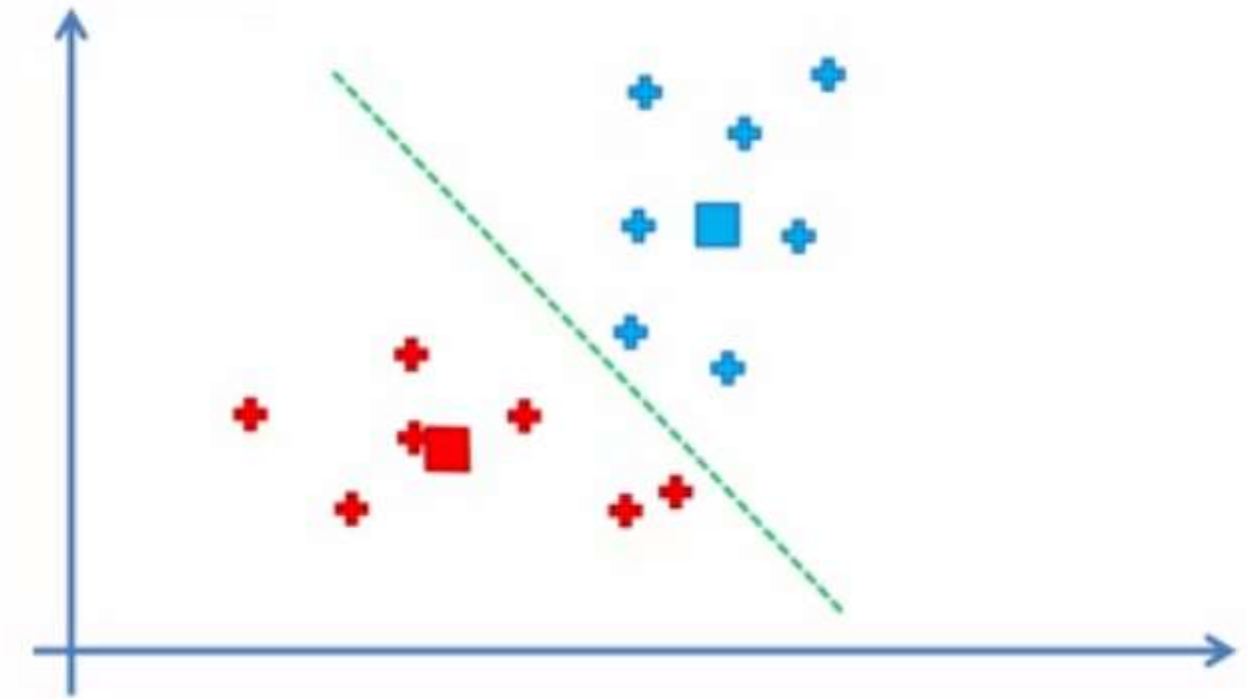
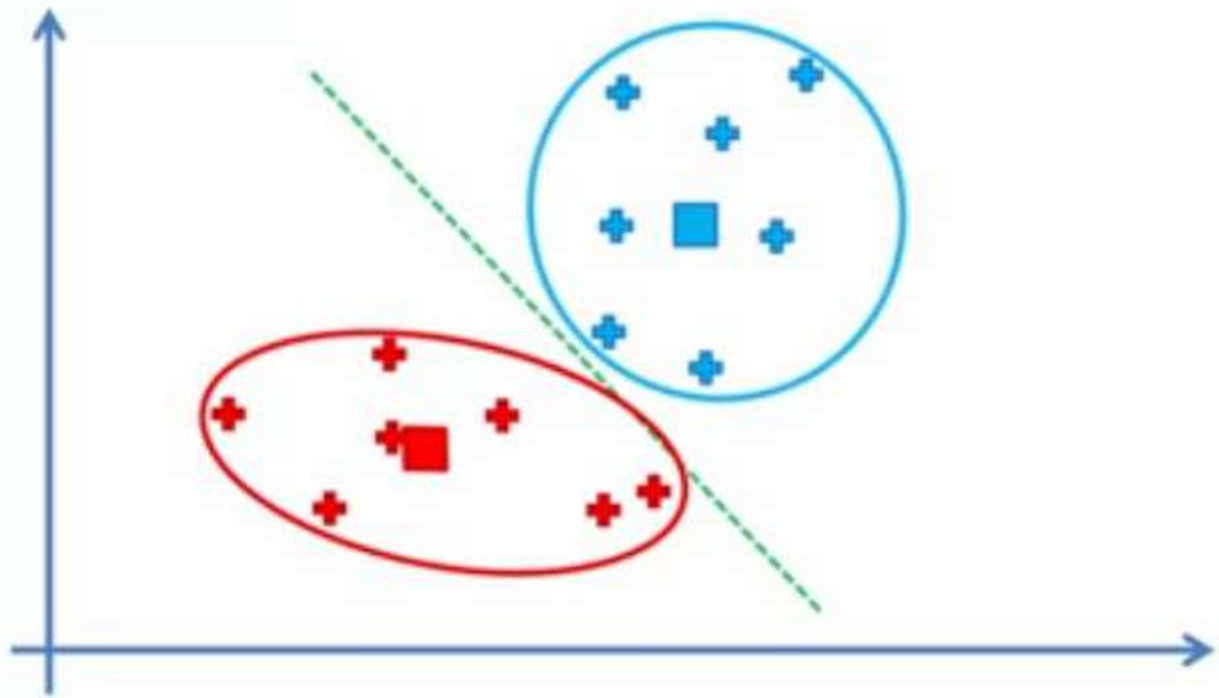


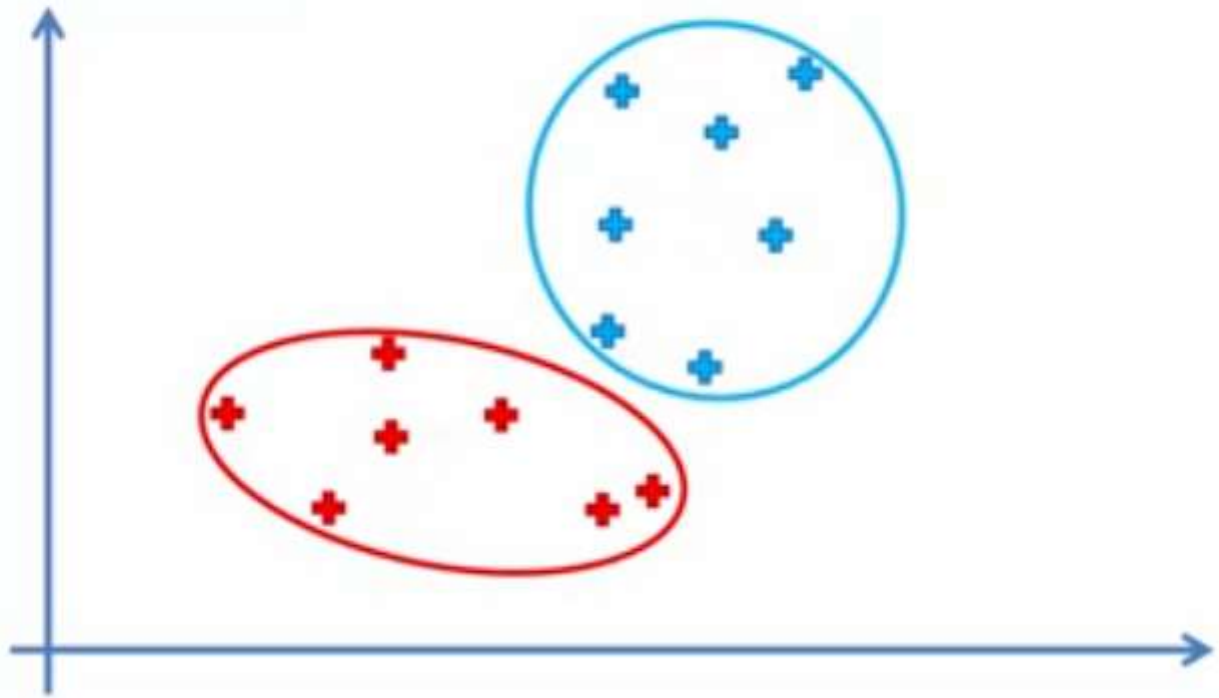
Sensitivity: Internal & Restricted

FIN: Your Model Is Ready



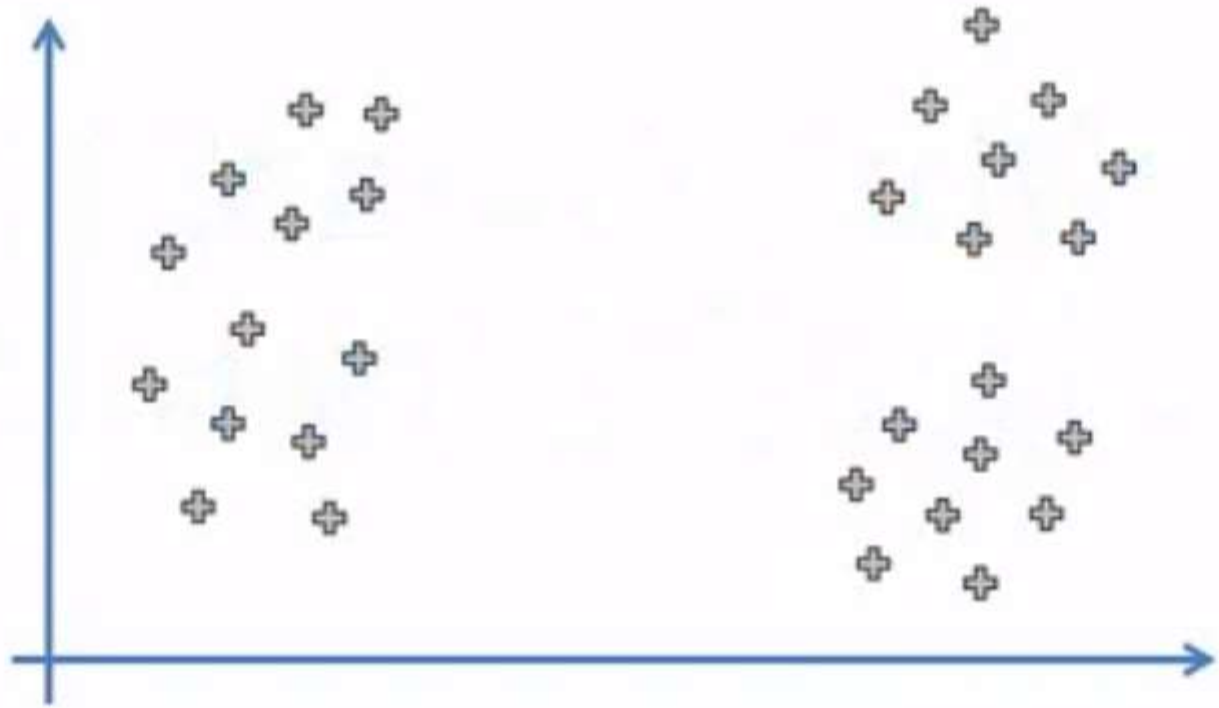
Sensitivity: Internal & Restricted

FIN: Your Model Is Ready



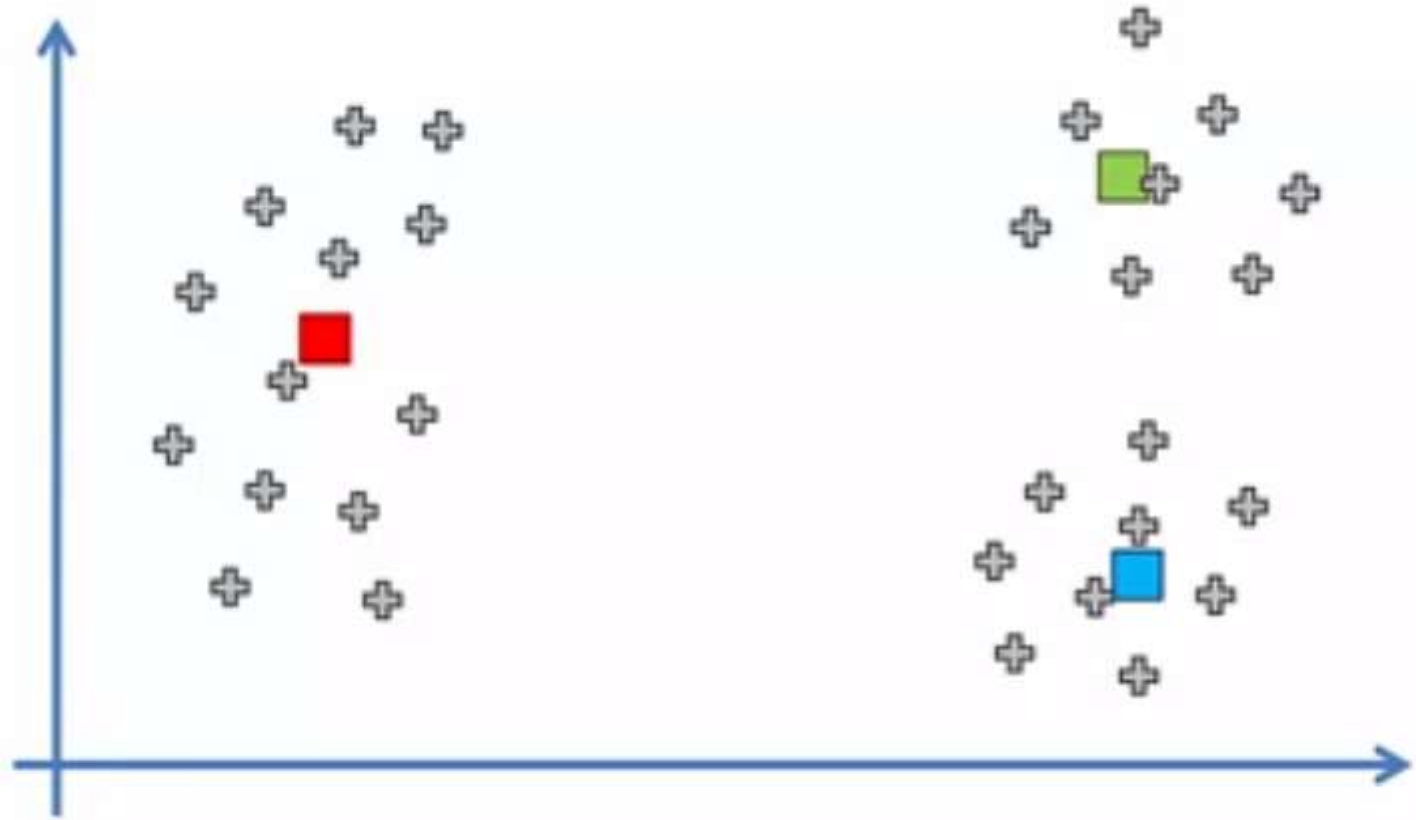
Sensitivity: Internal & Restricted

Random
Initialization Trap



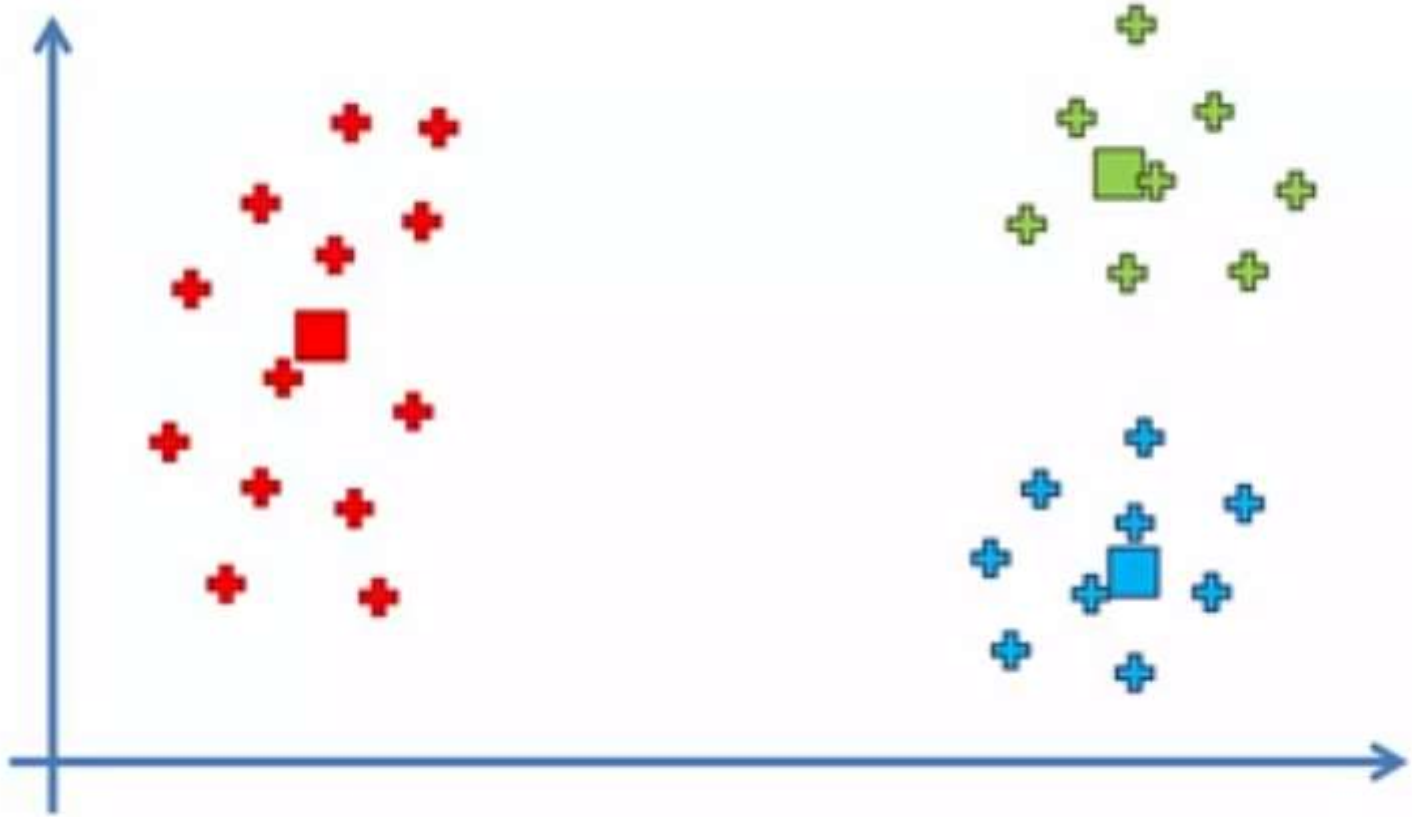
If we choose K = 3 clusters...

Sensitivity: Internal & Restricted



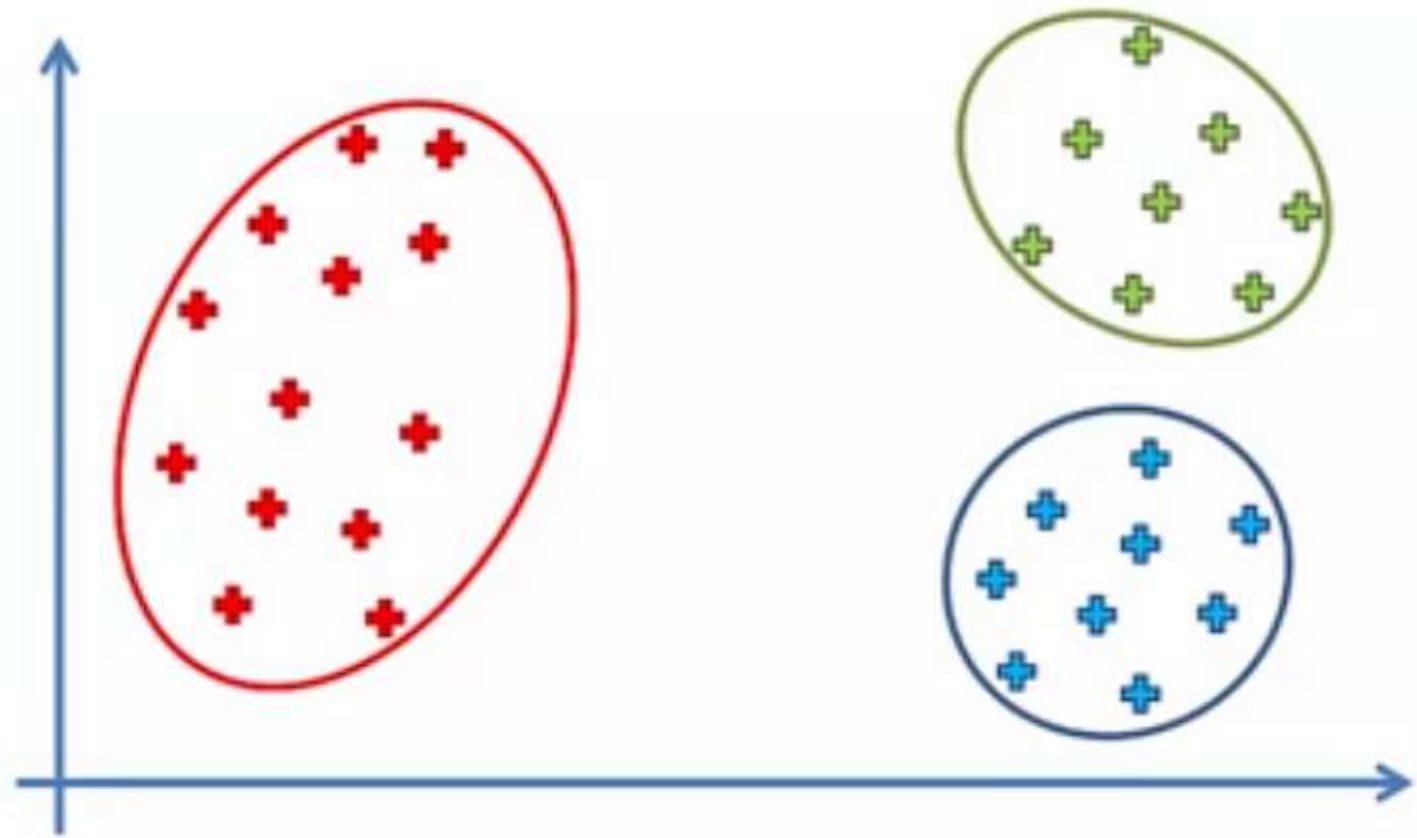
...this correct random initialisation would lead us to...

Sensitivity: Internal & Restricted



...the following three clusters

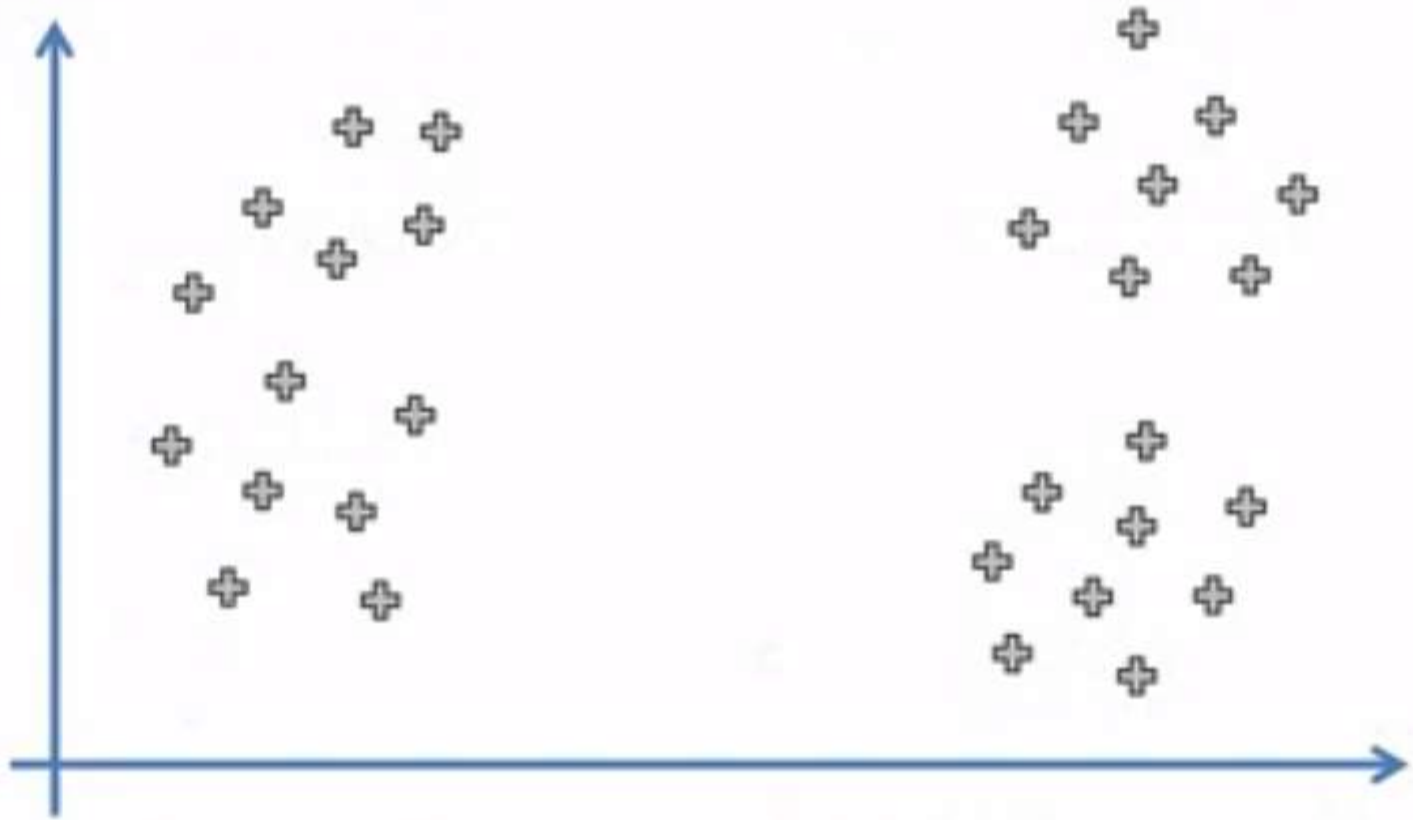
Sensitivity: Internal & Restricted



...the following three clusters

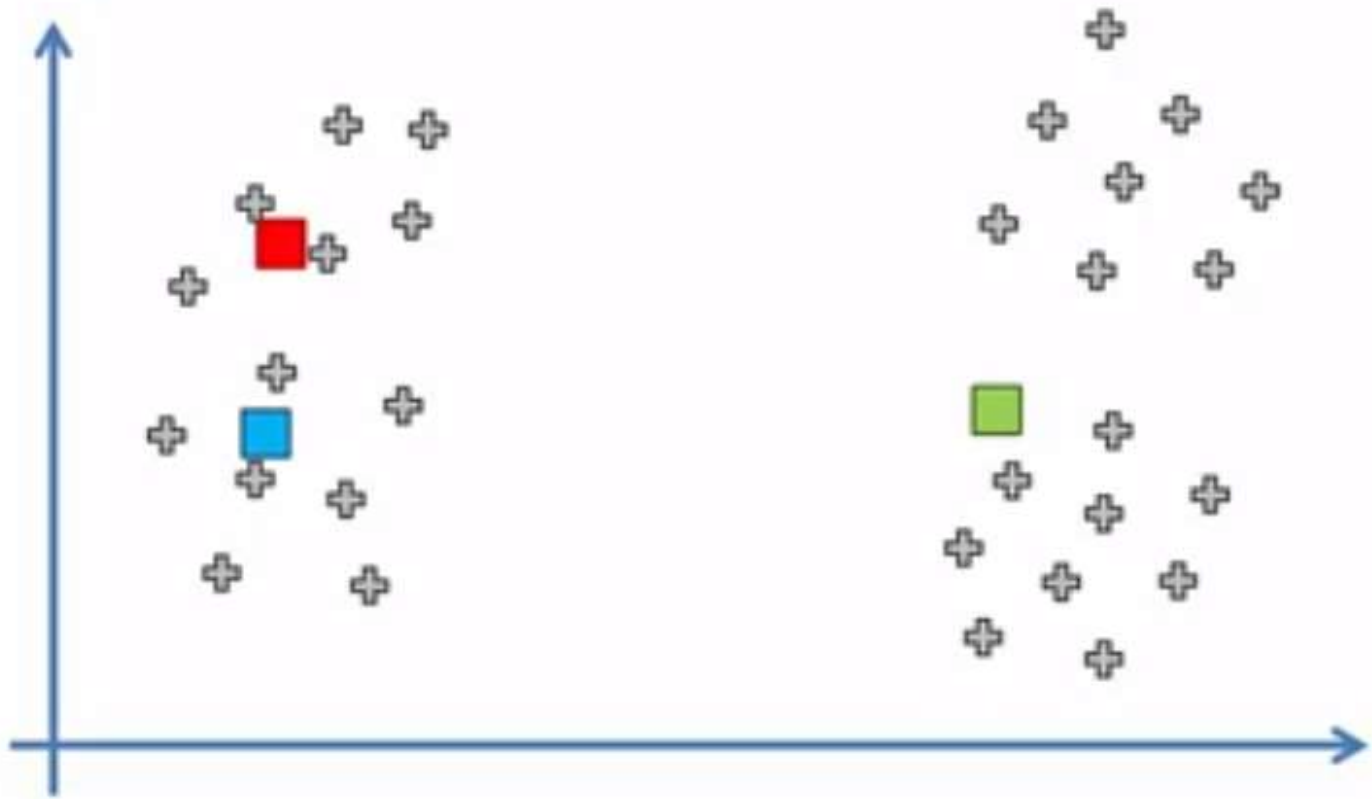
Sensitivity: Internal & Restricted

STEP 1: Choose the number K of clusters: K = 3



Sensitivity: Internal & Restricted

STEP 2: Select at random K points, the centroids (not necessarily from your dataset)



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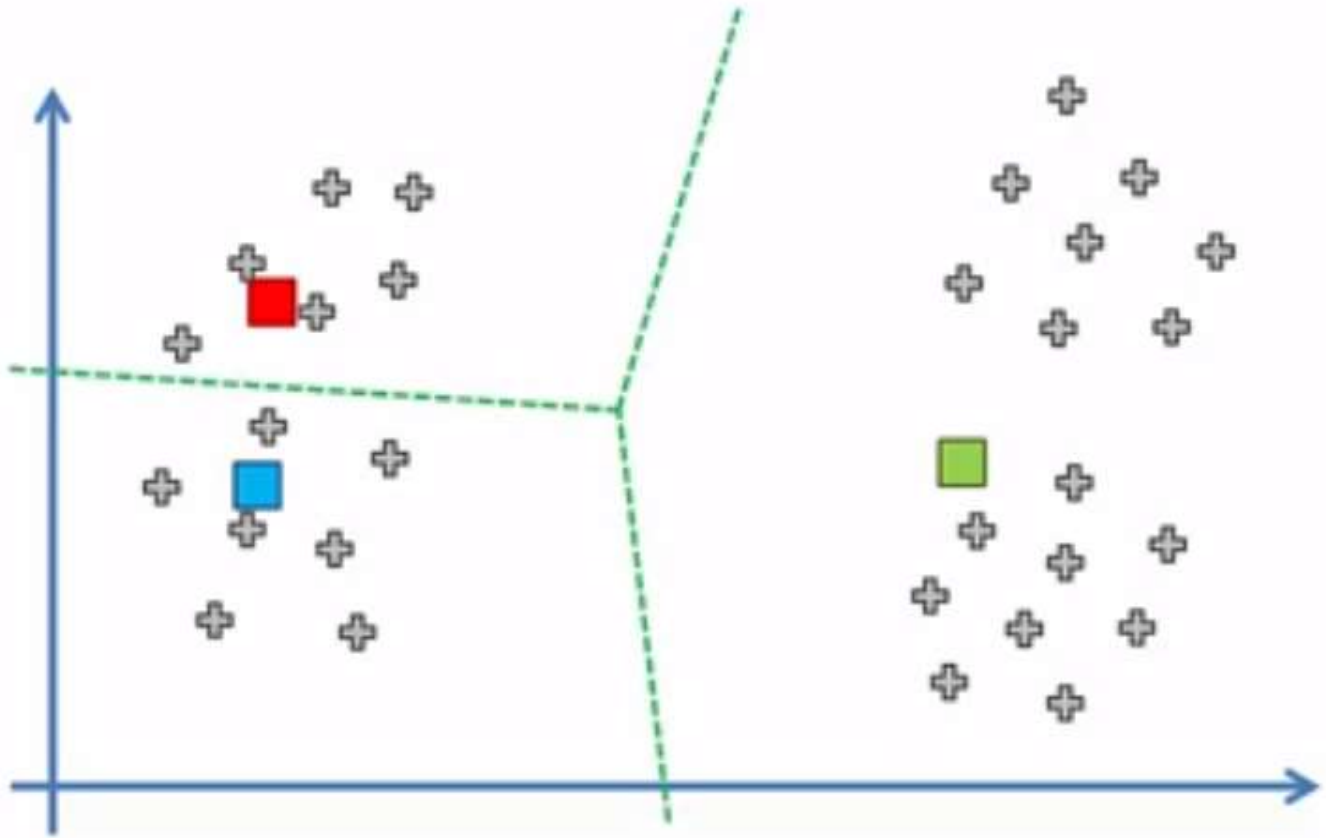

Sensitivity: Internal & Restricted

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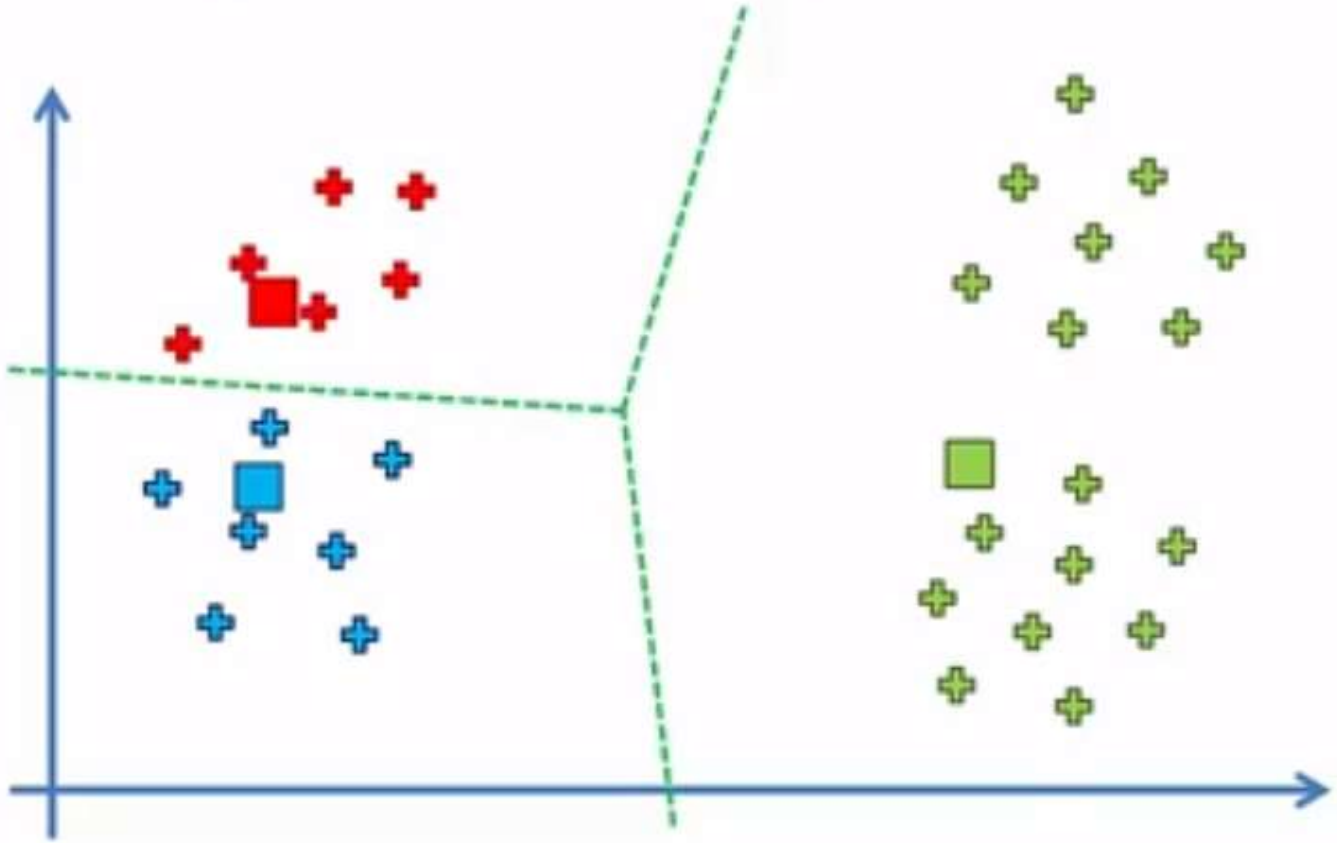

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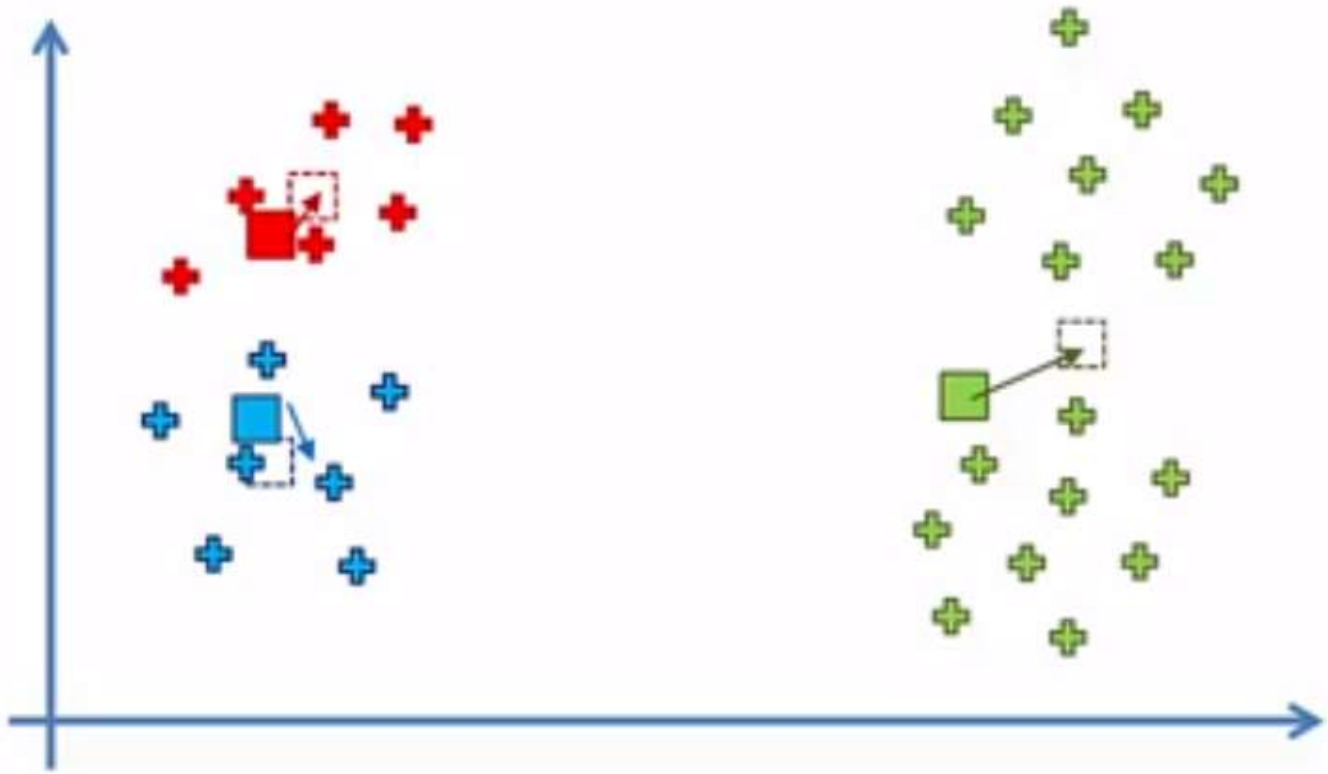
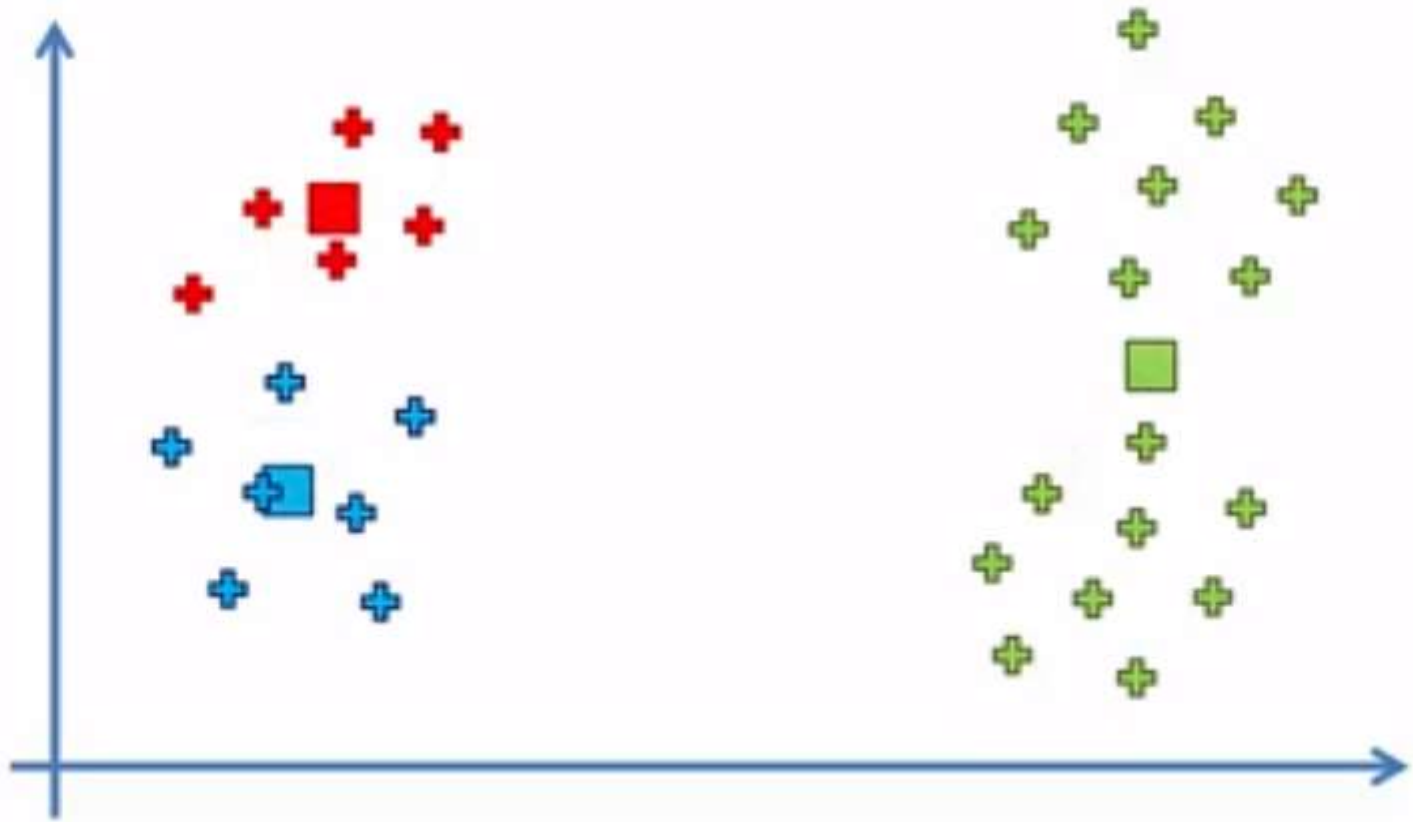


Sensitivity: Internal & Restricted

STEP 4: Compute and place the new centroid of each cluster



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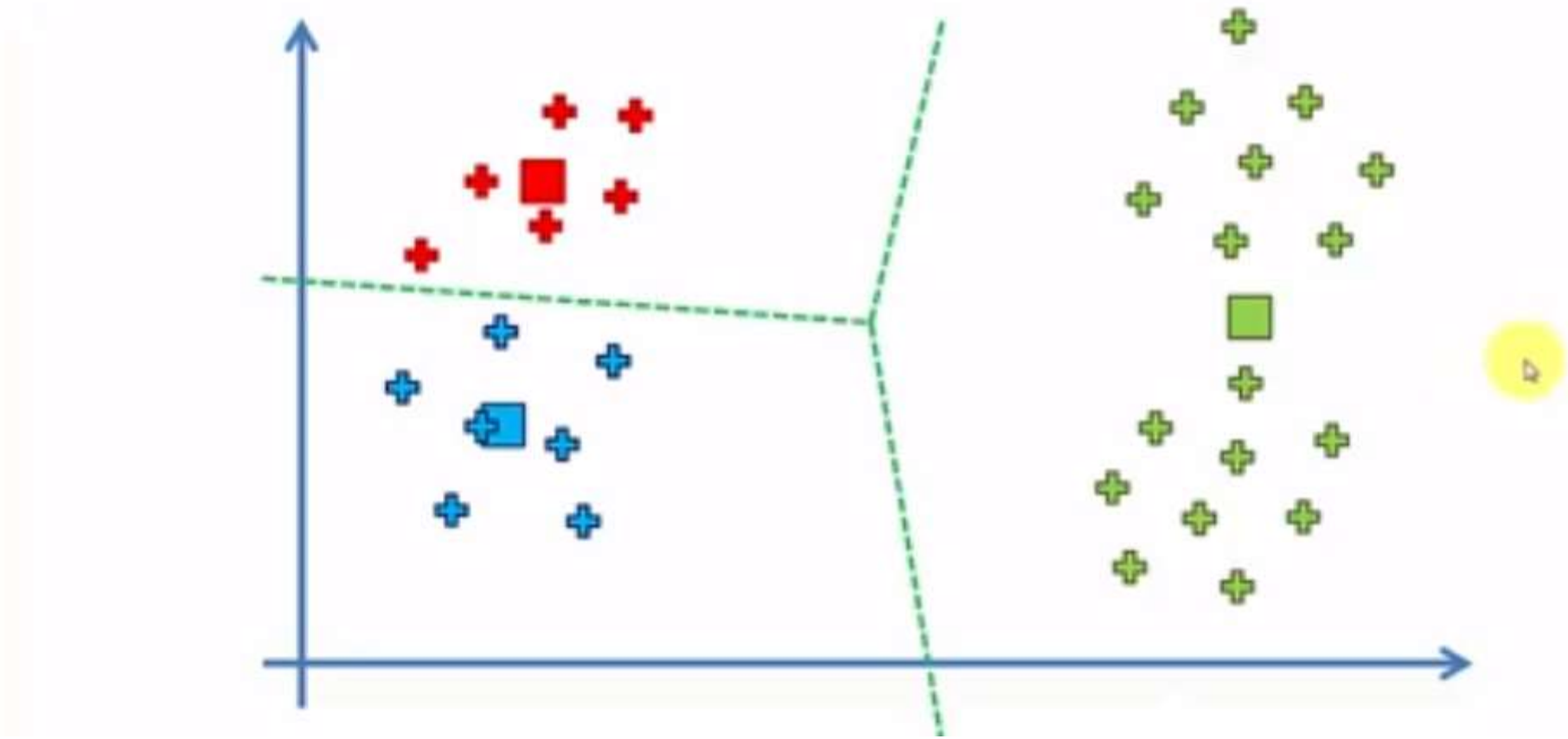

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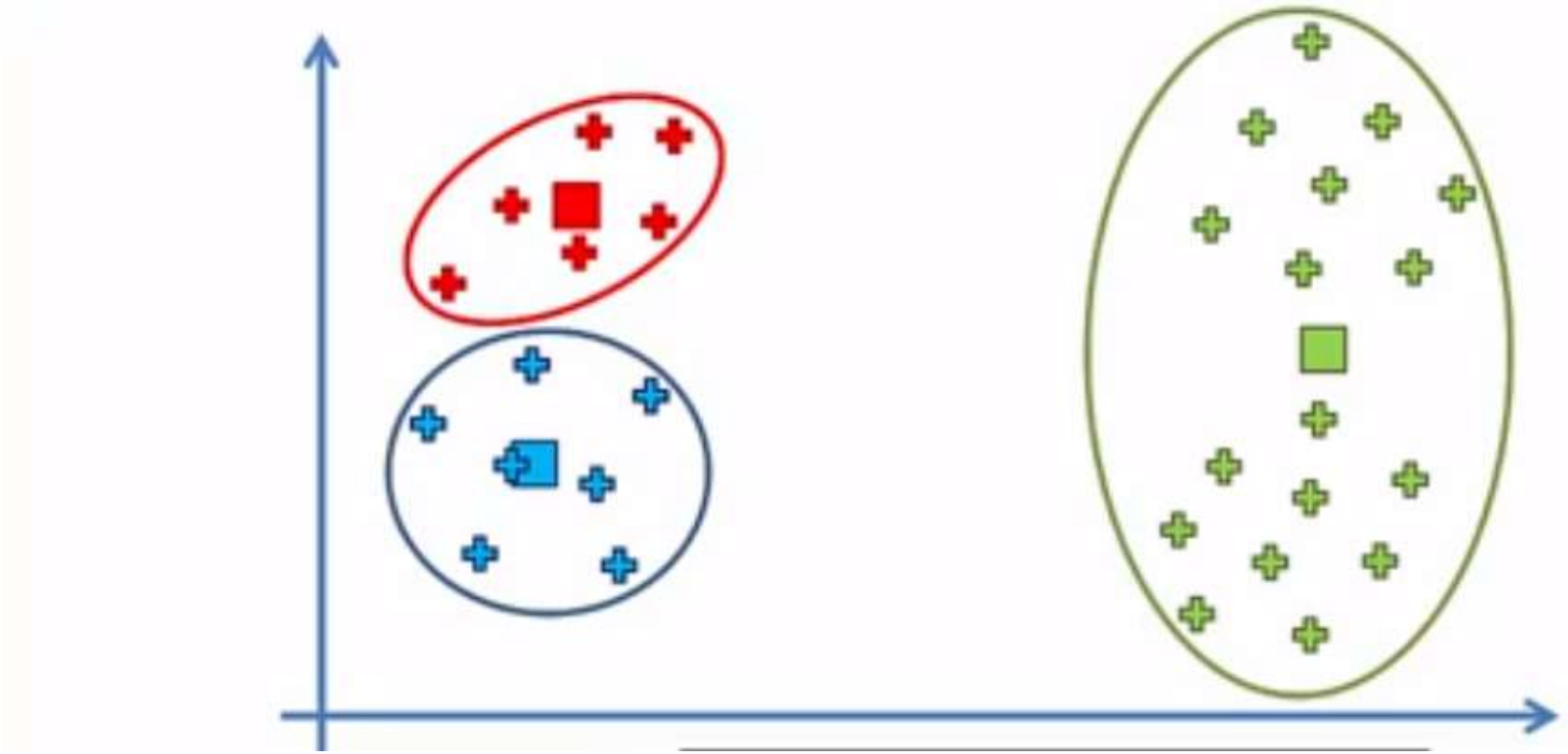
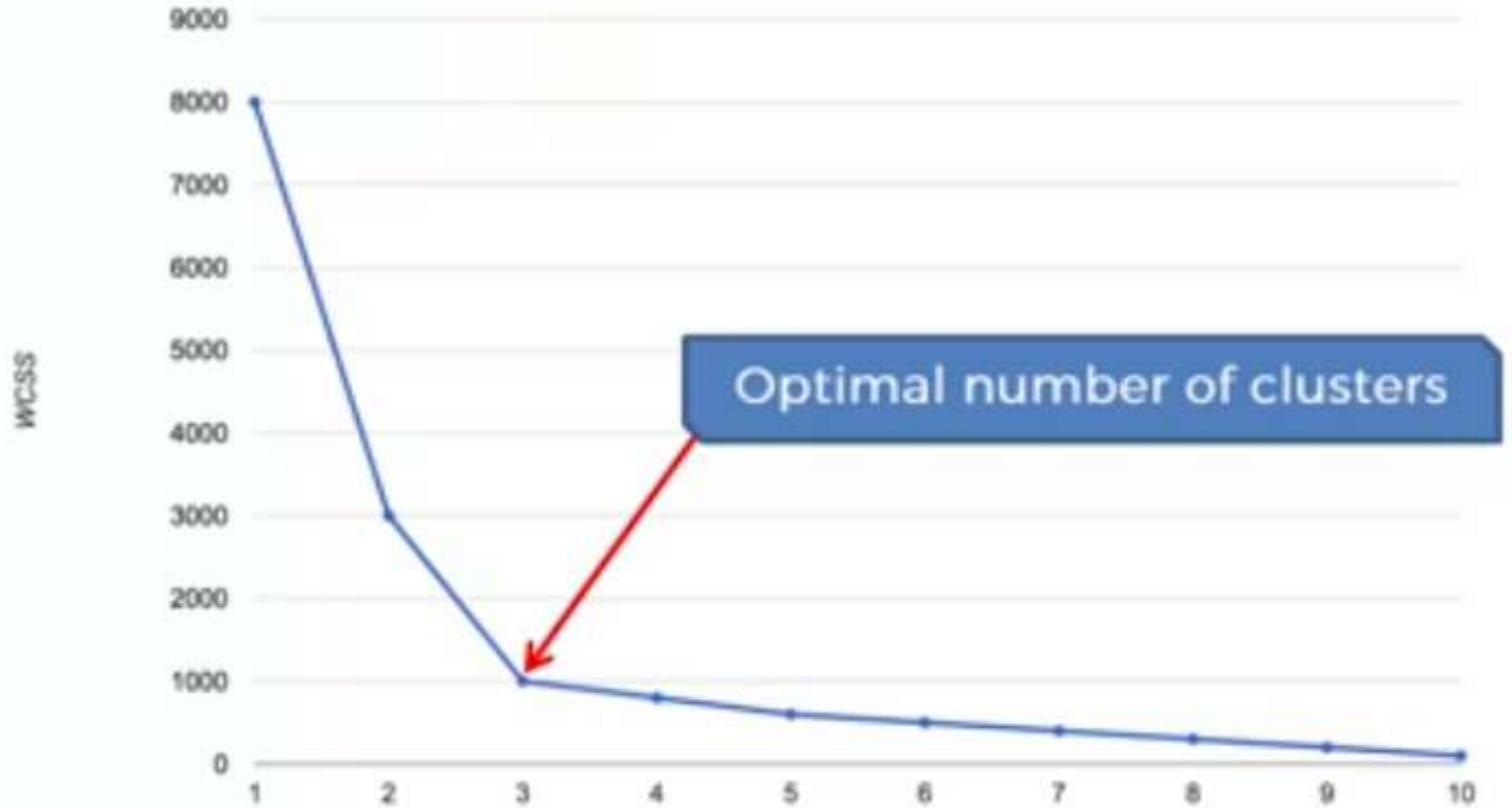


Sensitivity: Internal & Restricted

The elbow method

The Elbow Method



Sensitivity: Internal & Restricted