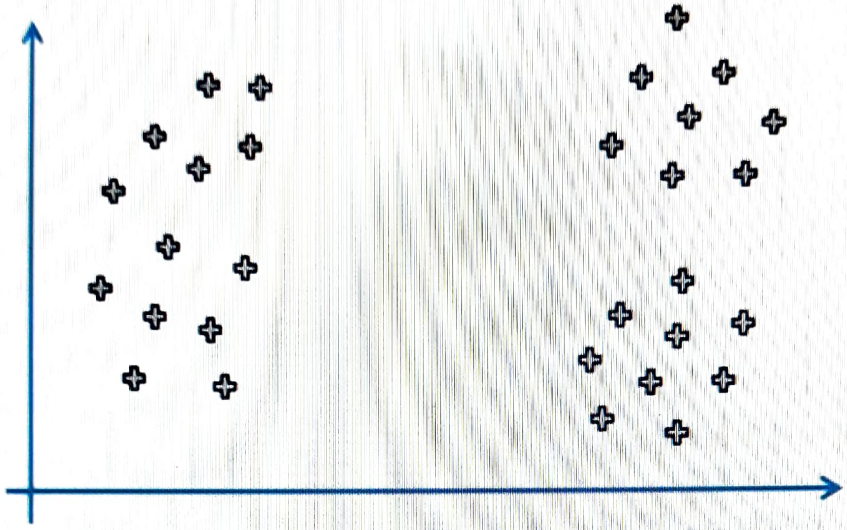
# K-Means Intuition: Random Initialization Trap



Hello welcome back to the course of machine learning.

# Random Initialization Trap



If we choose K = 3 clusters...



It does look like you can pretty easily spot them here.

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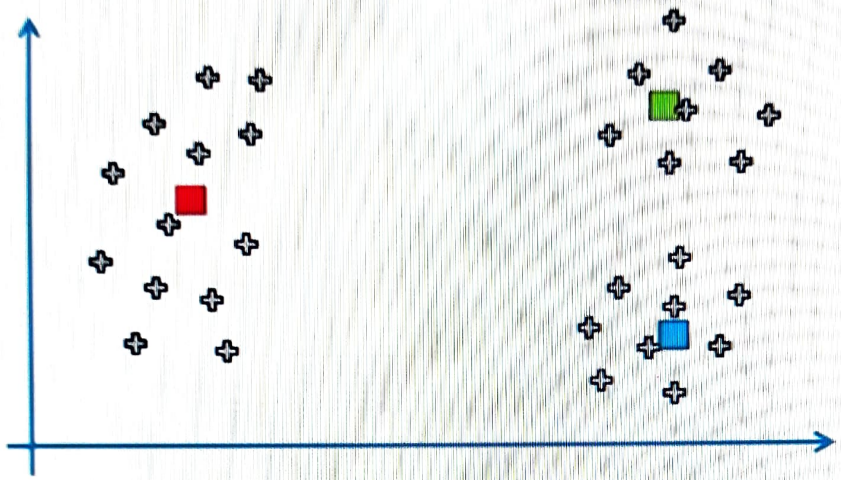

...this correct random initialisation would lead us to...

So just to make the algorithm a bit faster so we don't have to do too many easy steps and directions

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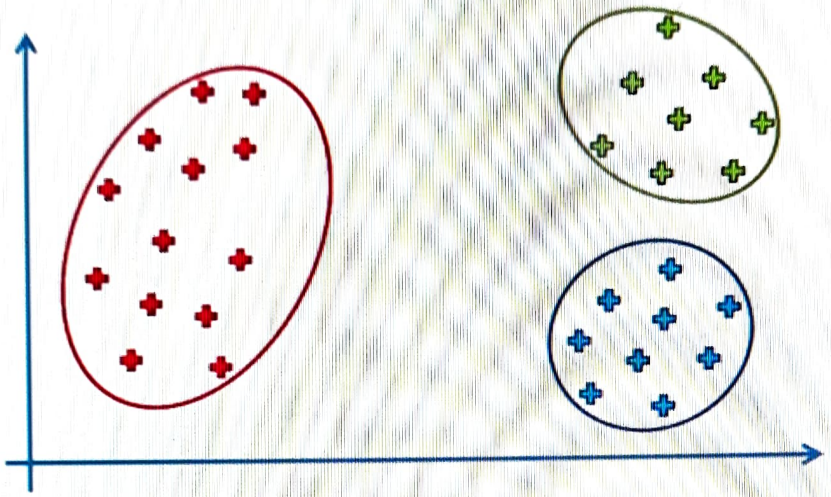


...the following three clusters

Now the question is What if we select a centroid in different locations will we be able to change the

# Random Initialization Trap

But what would happen if we had a bad random initialisation ?

So what will happen if we had a bad random initializations so bad is like a term we're going to use

# Random Initialization Trap

STEP 1: Choose the number K of clusters

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

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

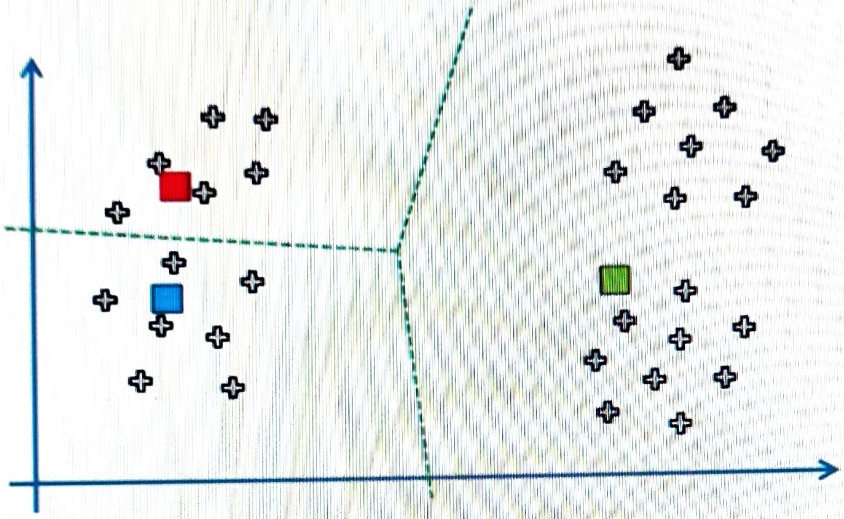
STEP 4: Compute and place the new centroid of each cluster

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


So these steps we discussed previously Let's have a look at them in action.

# Random Initialization Trap

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

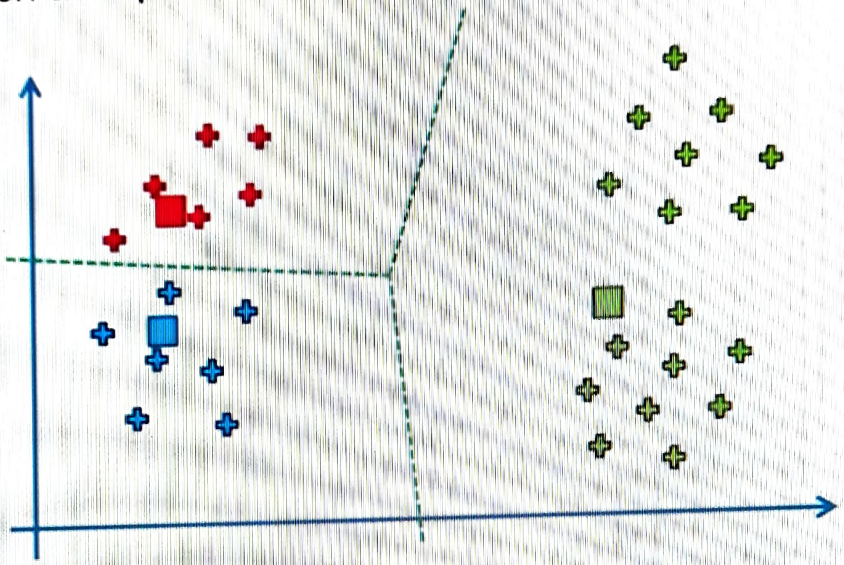




If we draw a line so this and we have 3 cluster two centroid.

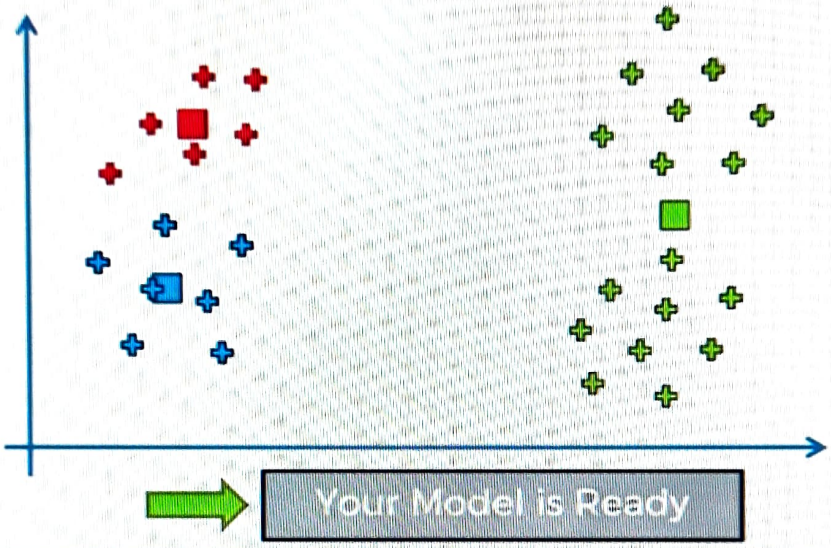
# Random Initialization Trap

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



# Random Initialization Trap

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



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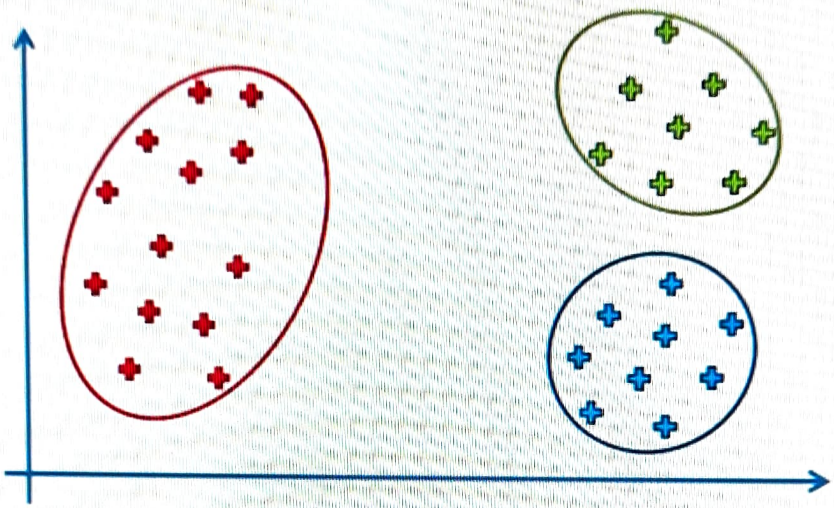

We're going to call them the truth 3 clusters because you can tell just from the charge you can tell

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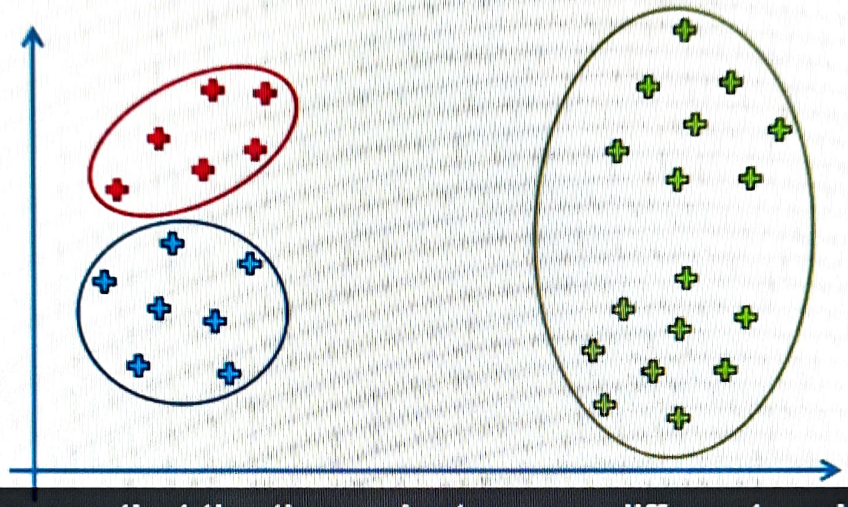

So you can see that the three clusters are different and therefore what we have is a situation or phenomenon

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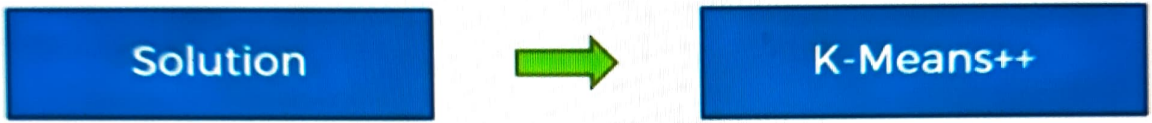


458 people have written a note here.

You can definitely read up more about it on Wikipedia or other sources.