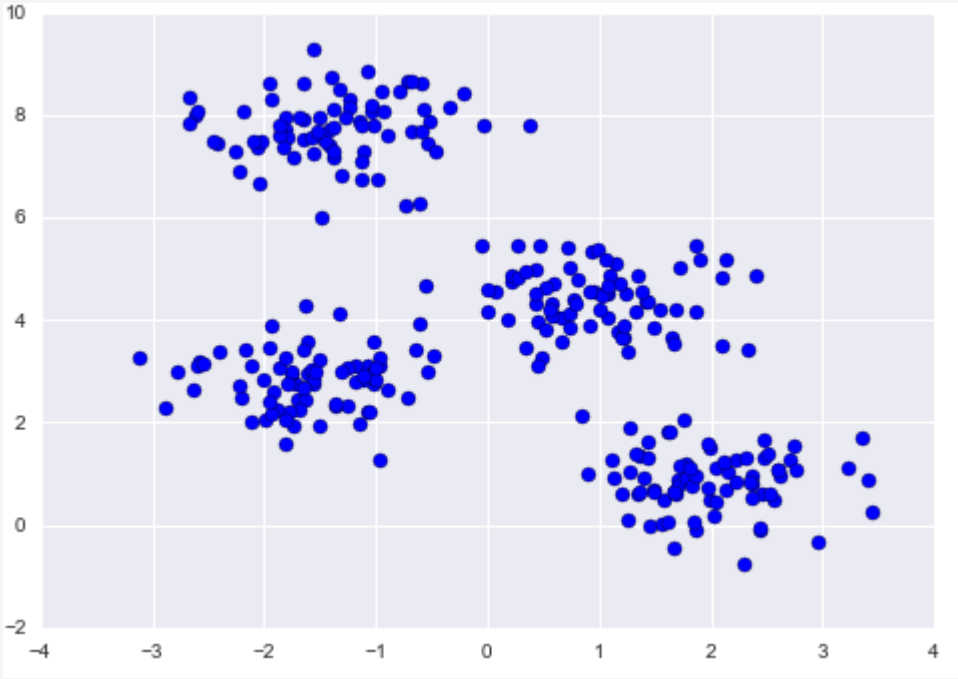
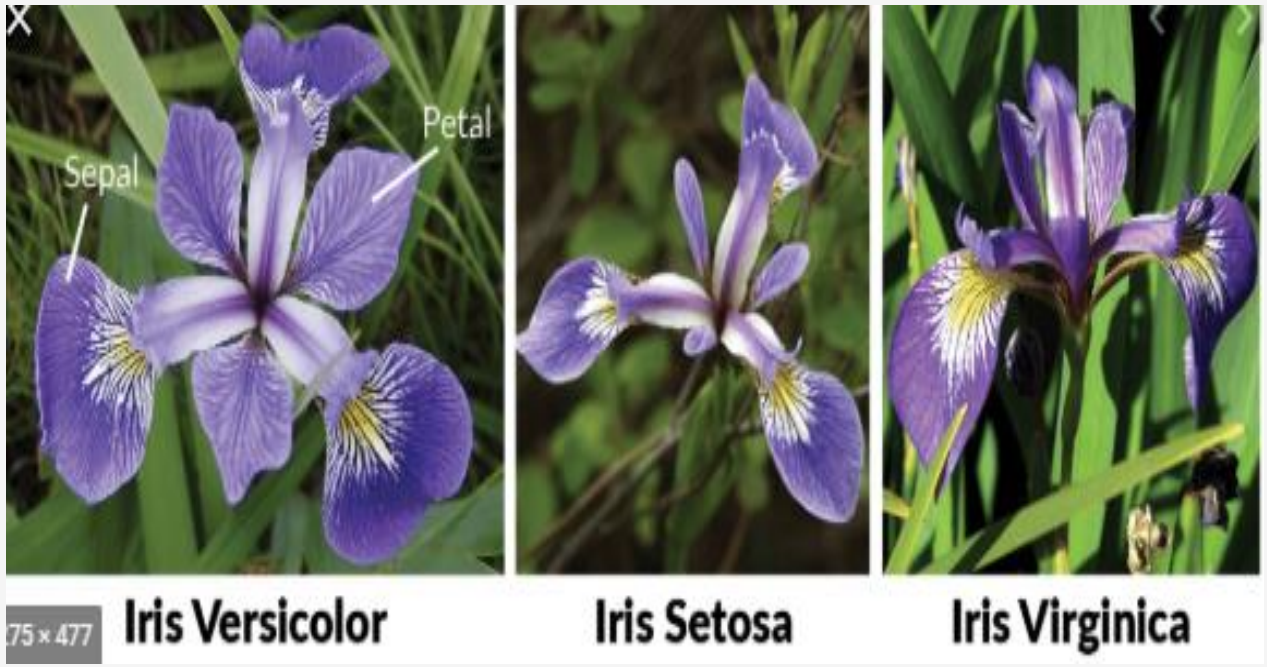
Clustering

- Unsupervised Learning
- Goal of clustering is to group set of objects based on similar characteristics
- Help find meaningful structure among your data, group similar data together and discover underlying patterns

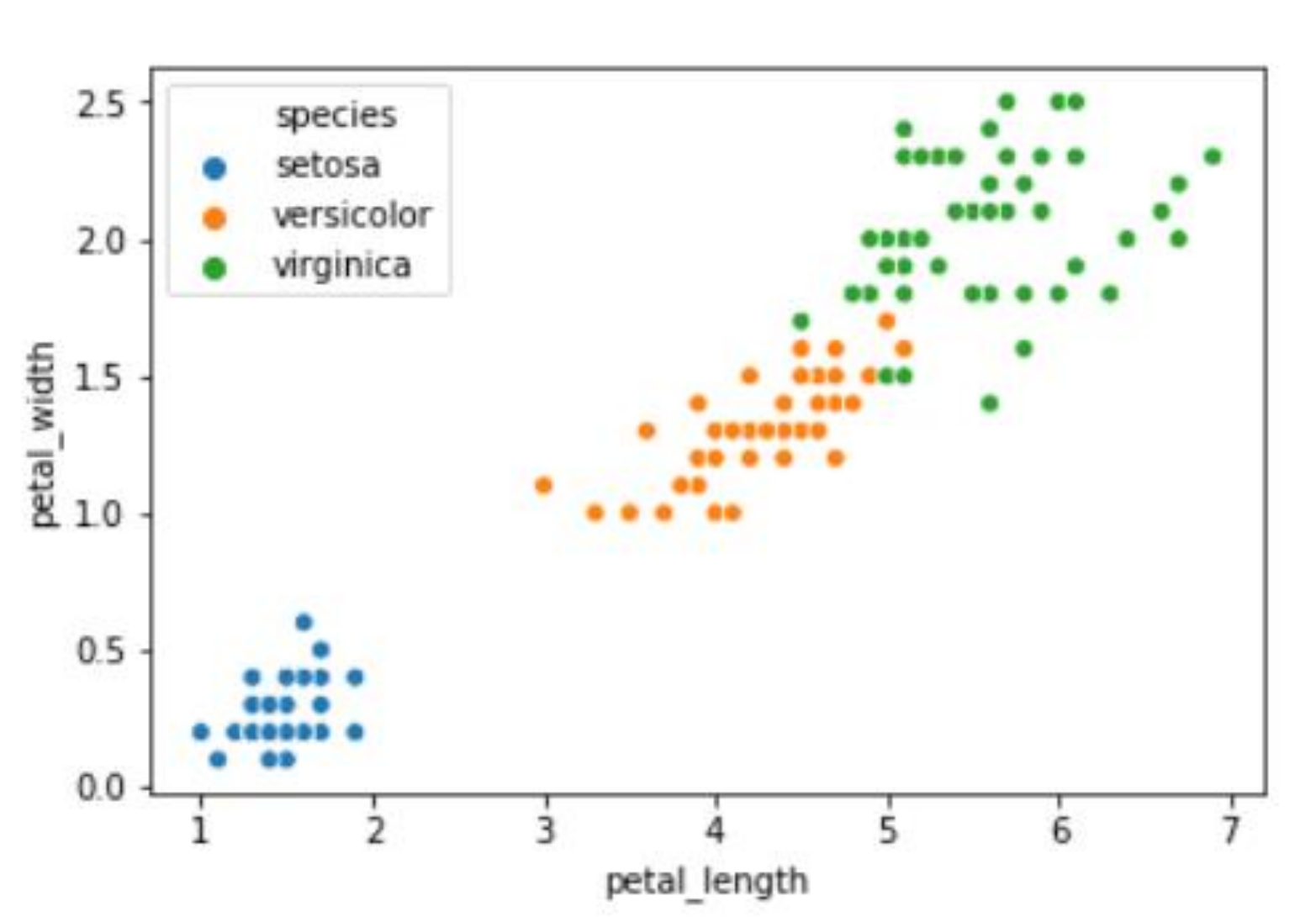


Iris dataset

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa



Iris dataset



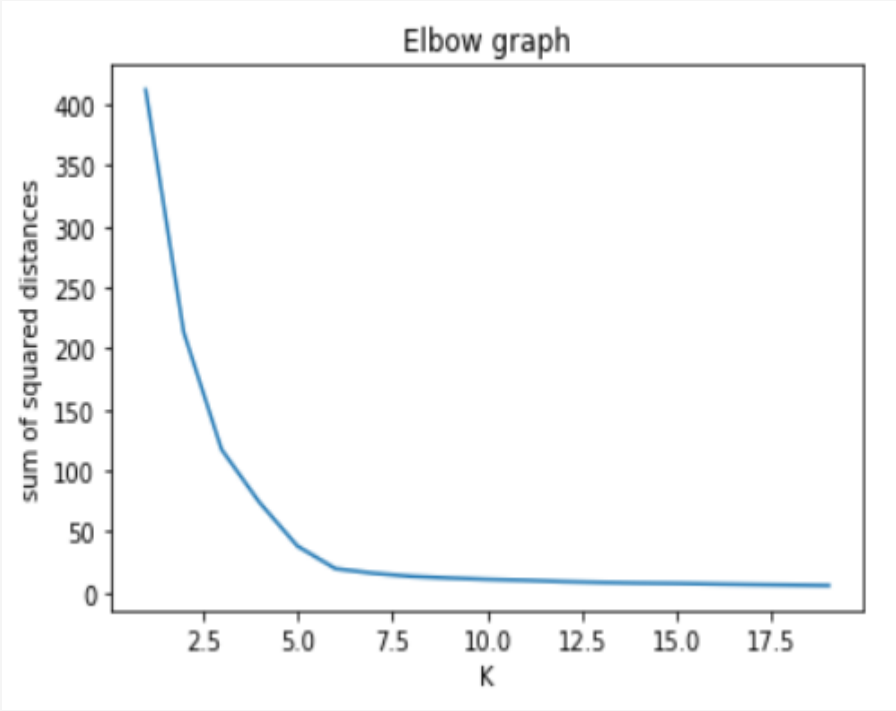
K-Means Algorithm

1. Pick a value for k (the number of clusters to create)
2. Initialize k ‘centroids’ (starting points) in your data
3. Create your clusters. Assign each point to the nearest centroid.
4. Make your clusters better. Move each centroid to the center of its cluster.
5. Repeat steps 3–4 until your centroids converge.

https://www.youtube.com/watch?v=_aWzGGNrcic
Starting from 4:20

How to choose K?

- Sum of squared distance of each data point to its closest centroid should be small if our clusters make sense
- So if try different value of K, this sum of squared should decreases
- After certain value of K, the marginal benefit of adding more cluster would not help
- The resulting graph looks like an elbow and one can pick K by looking at the point of inflection. The graph is called an elbow graph



Learning by doing