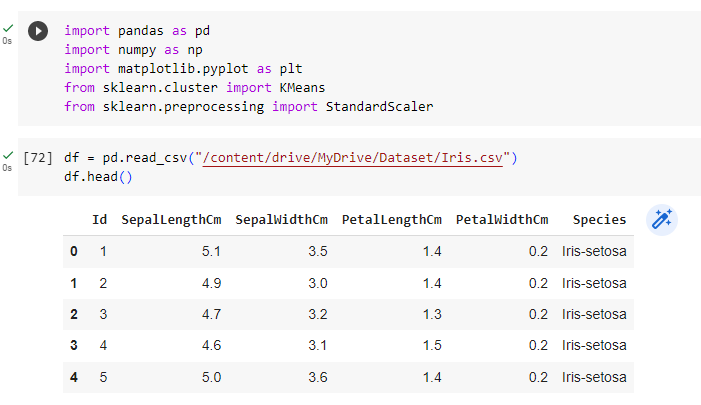
**LAB # 09**

**Task # 1: You work as a data scientist at a botanic garden, and your team is interested in analyzing the Iris dataset to identify patterns in the measurements of different types of iris flowers. The dataset contains measurements for the sepal length, sepal width, petal length, and petal width of three different types of iris flowers: setosa, versicolor, and virginica. Your goal is to use K-means clustering to group the flowers based on their measurements and determine if the measurements can be used to accurately identify the different types of iris flowers.**

1. **Load the Iris dataset into a Pandas dataframe.**
2. **Drop the 'species' column from the dataframe, as we will be performing unsupervised clustering.**
3. **Scale the data and use the elbow method to determine the optimal number of clusters for K-means clustering.**
4. **Perform K-means clustering on the scaled data using the optimal number of clusters.**
5. **Visualize the results of the clustering by creating a scatter plot of the data points, with each point colored based on its assigned cluster.**
6. **Analyze the results of the clustering to identify patterns in the measurements of the different types of iris flowers.**

**Solution:**

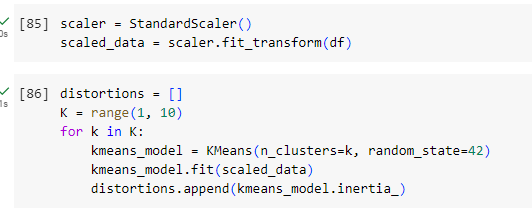
1. **Load the Iris dataset into a Pandas dataframe.**

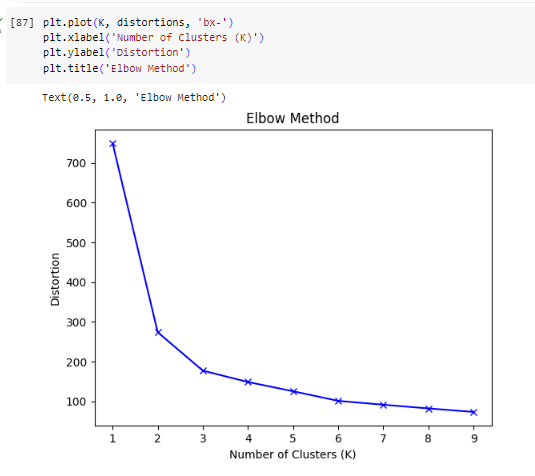


1. **Drop the 'species' column from the dataframe, as we will be performing unsupervised clustering.**

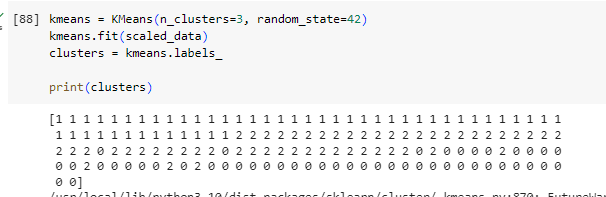


1. **Scale the data and use the elbow method to determine the optimal number of clusters for K-means clustering.**

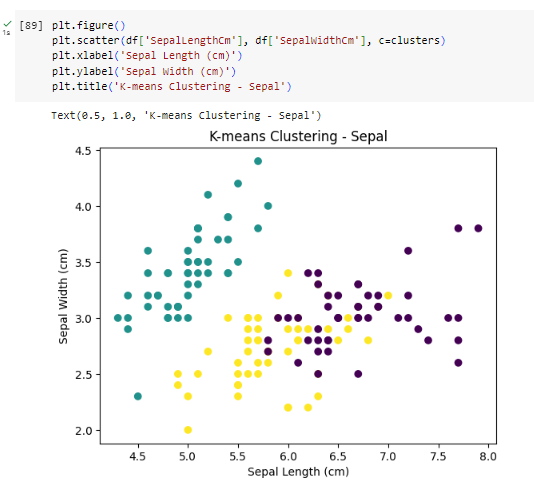


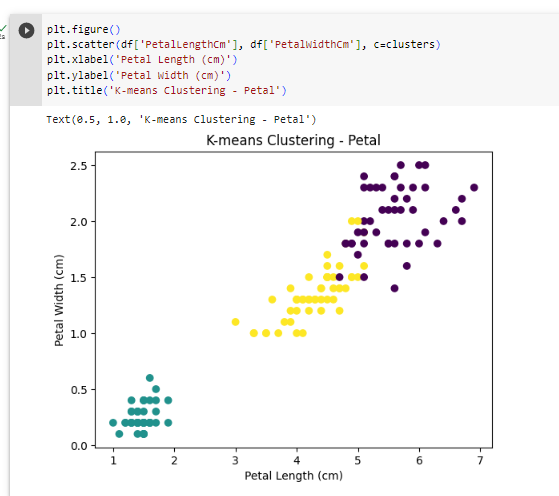


1. **Perform K-means clustering on the scaled data using the optimal number of clusters.**



1. **Visualize the results of the clustering by creating a scatter plot of the data points, with each point colored based on its assigned cluster.**





1. **Analyze the results of the clustering to identify patterns in the measurements of the different types of iris flowers.**

