Instructions:

Please read the instructions very carefully.

1. This is an **INDIVIDUAL WORK** unless specified otherwise. Students are not allowed to share their answers (actual coding) but are allowed to discuss with each other to solve the problems.

2. The tasks will be checked during the practical session itself therefore students will be assessed based on participation and their answers.

3. To start:

    a. Create a new folder called **StudentID-P1**. Please change student id to your own personal ID and change the 1 to the correct practical number.

    b. Create one .ipynb / .py file for each question with the naming convention question1.ipynb, question2.ipynb and so on.

    c. The following information must be included in each file:
        i. Student Name
        ii. Student ID
        iii. Module Code and Title

4. Please note that **ALL FILE AND NAMING CONVENTIONS** must be followed.

5. The **GREEN** colored font in the sample output represents an input from the user.

6. The **BLUE** colored font in the sample output represents a dynamic output.

7. Please note that the colored fonts will vary on the values specified. In other words, they are just **SAMPLES** only.

8. All tasks must be completed within the session. Students are given enough time to complete the tasks listed.

9. Once completed, please create a zip file with the same name as your folder, and upload it to LMS before the end of the session. A submission link will be provided.

10. Students are encouraged to upload their work to their own GitHub account. Students are also encouraged to include the GitHub link in the submission.

11. Students are encouraged to ask questions during the practical if they encountered a problem.

Question 1:

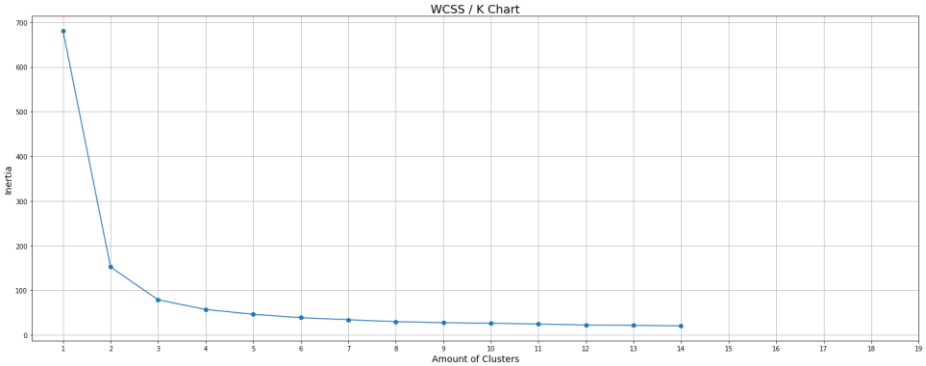
Apply unsupervised modelling techniques specifically k-means clustering and agglomerative clustering (hierarchical clustering) on any datasets of your choosing.

a) K-Means clustering
   i. Determine the best cluster using elbow method
   ii. Plot the clusters and compare it with original labels

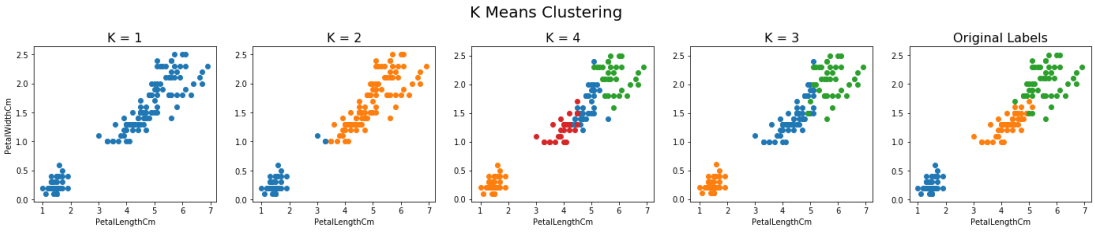
b) Agglomerative Clustering

Sample Output:

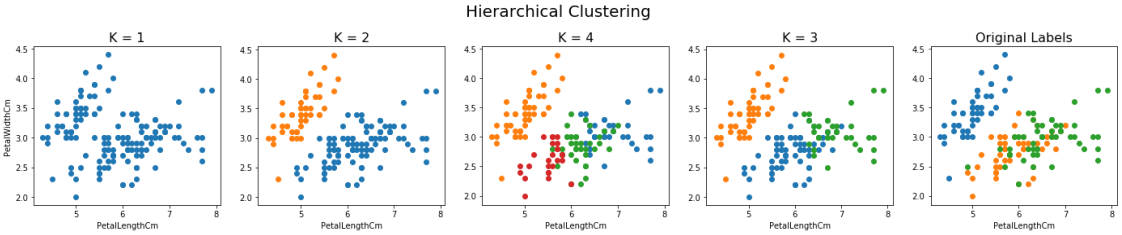
a) K-Means Clustering:
   i. Best number of clusters is 3 or 2



   ii. Plot clusters



b) Agglomerative Clustering



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