

# CS 564: Foundations of Machine Learning

## Assignment 1

**Deadline: 26 August 2022**

- Markings will be based on the correctness and soundness of the outputs.
- Marks will be deducted in case of plagiarism.
- Proper indentation and appropriate comments (if necessary) are mandatory.
- Use of frameworks like scikit-learn etc is allowed.
- *All benchmarks(accuracy etc), answers to questions and supporting examples should be added in a separate file with the name 'report'.*
- *All code needs to be submitted in '.py' format.* Even if you code it in '.ipynb' format, download it in '.py' format and then submit
- You should zip all the required files and name the zip file as:
  - <roll\_no>\_assignment\_<#>.zip, eg. 1501cs11\_assignment\_01.zip.
- Upload your assignment ( the zip file ) in the following link:
  - <https://www.dropbox.com/request/GBzzFlhrK9ZDPbtbL4S7>

### Problem Statement:

- The assignment targets to implement K-Means and K-Medoid algorithms to cluster the dataset consists of socio-economic and health factors of countries and determine the overall development of the country

### Implementation:

- Implement K-Means and K-Medoid algorithms to cluster the given dataset as follows:
  - Perform standard data cleaning operations such as data cleaning (handling missing values) and data scaling (handling the outliers)
  - Perform 5-fold cross validation
  - Classify the countries according to the following categories:
    - Developed Country
    - Developing Country
    - Under-Developing Country

### Dataset:

- Link to dataset:  
<https://www.kaggle.com/datasets/rohan0301/unsupervised-learning-on-country-data>

**Documents to submit:**

- Model code
- Accuracy, Precision, Recall and F1 Scores of each fold
- Visualization of clusters after the model is converged

**For any queries regarding this assignment contact:**

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