Assignment #2: Classification and Regression using ANN

This assignment is due on **Tuesday, January 14 2022** at 11:59 pm IST

Total Points: **10**

General Instructions:

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1. You have to do this lab individually.
2. All the code should be submitted in the form of a single Jupyter notebook itself, along with the report containing observations and graphs (loss, mse, accuracy).
3. It is encouraged to use Google colab to run a jupyter notebook (https://colab.research.google.com/)
4. The lab must be submitted on Google classroom.
5. The code with accompanying observations should be made part of the python notebook.
6. Code readability is very important.
7. The assessment will be through viva where you may have to explain your code.
8. Students are expected to follow the honor code of the class.

Goal:

In this assignment, you will apply neural network models to (1) predict the crop yield and (2) classify the crop based on yield.

The task to be done:

- Use the complete agriculture dataset for this assignment. Read the yield, rainfall, temperature, and pesticide files. Combine the information in a single processed file. Plot graphs to visualize your data.
- Use an encoder to encode the label attributes wherever necessary.
- Normalize or standardize the dataset along each feature vector. Split the dataset into train and test (80:20). Further take 10% for validation from the training volume.

- Train an ANN classifier of your choice to classify the crop based on given data. Use functional API for creating the network. Experiment with different numbers of layers, number of neurons, and choice of optimization function.
- Train an ANN regressor of your choice to predict the crop yield based on given data. Use functional API for creating the network. Experiment with different numbers of layers, numbers of neurons, and choice of optimization function.

Note: both regression and classification networks should be different.

- Report the accuracy and confusion matrix for classification.
- Report the error for regression analysis.