Assignment 1

There is an automobile dataset to predict the fuel efficiency. The dataset can be imported your colab notebook using the following code:

```
dataset_path = keras.utils.get_file("auto-mpg.data",
"http://archive.ics.uci.edu/ml/machine-learning-databases/auto-
mpg/auto-mpg.data")
column_names = ['MPG','Cylinders','Displacement','Horsepower','Weight',
                'Acceleration', 'Model Year', 'Origin']
dataset = pd.read_csv(dataset_path, names=column_names,
                      na_values = "?", comment='\t',
                      sep=" ", skipinitialspace=True)
```

Now, the 'dataset' is the data frame on which you need to implement the Linear Regression using Feed forward neural network (MLP architecture). Note that the target variable name is 'MPG' in the dataset.

Tasks:

- Perform appropriate exploratory data analysis technique to treat missing values, to visualize the required plot etc.
- Divide the data into train and test set with 80:20 ratio.
- Perform appropriate normalization technique.
- Build the NN model with adequate number of hidden layers, appropriate optimizer and loss functions.
- Display the model summary and give your explanation on number of trainable parameters.
- Fit the model by taking validation data as 20% of training data.
- Plot the graph of Number of epochs vs/ training and validation loss
- Check whether any overfitting is there in the model. If yes, apply early stopping technique to avoid it.
- Evaluate the model and predict it on testing data.
- Draw a graph of actual values v/s predicted values (regression line and scatter plot)

NOTE: Upload/send your solution file as .HTML or PDF only.