**Demonstration of Underfitting and Overfitting models.**

**Preamble**: Overfitting or Underfitting data causes poor performance of models. Overfitting refers to a model that models the training data too well. Overfitting happens when a model learns the detail and noise in the training data to the extent that it negatively impacts the performance of the model on new data whereas Underfitting refers to a model that can neither model the training data nor can generalize to new data. An underfitted model not able to capture underlying trends of data.

**Problem:** In this section we will see how underfitting and overfitting occurs and how to deal with it on the sample data using different Regularisation Techniques

**Exercise I**: Study the given script and perform same tasks for sample data from different distribution.

**Exercise II:**

1. Write the function of 𝐧𝐮𝐦𝐩𝐲.𝐫𝐚𝐧𝐝𝐨𝐦.𝐧𝐨𝐫𝐦𝐚𝐥(𝒍𝒐𝒄=𝟎.𝟎, 𝒔𝒄𝒂𝒍𝒆=𝟏.𝟎, 𝒔𝒊𝒛𝒆=𝟓𝟎)

2. Write the significance of alpha in Ridge regression function.

3. How we can detect underfitting and overfitting? Methods to overcome Underfitting and overfitting.

4. Write the Significance of np.reshape(-1,1) function.

**References**:

1. https://towardsdatascience.com/what-are-overfitting-and-underfitting-in-machine-learning-a96b30864690

2. https://scikit-learn.org/stable/auto\_examples/model\_selection/plot\_underfitting\_overfitting.html

3. https://scikit-learn.org/stable/modules/generated/sklearn.linear\_model.Ridge.html