The IRIS DATASET REPORT

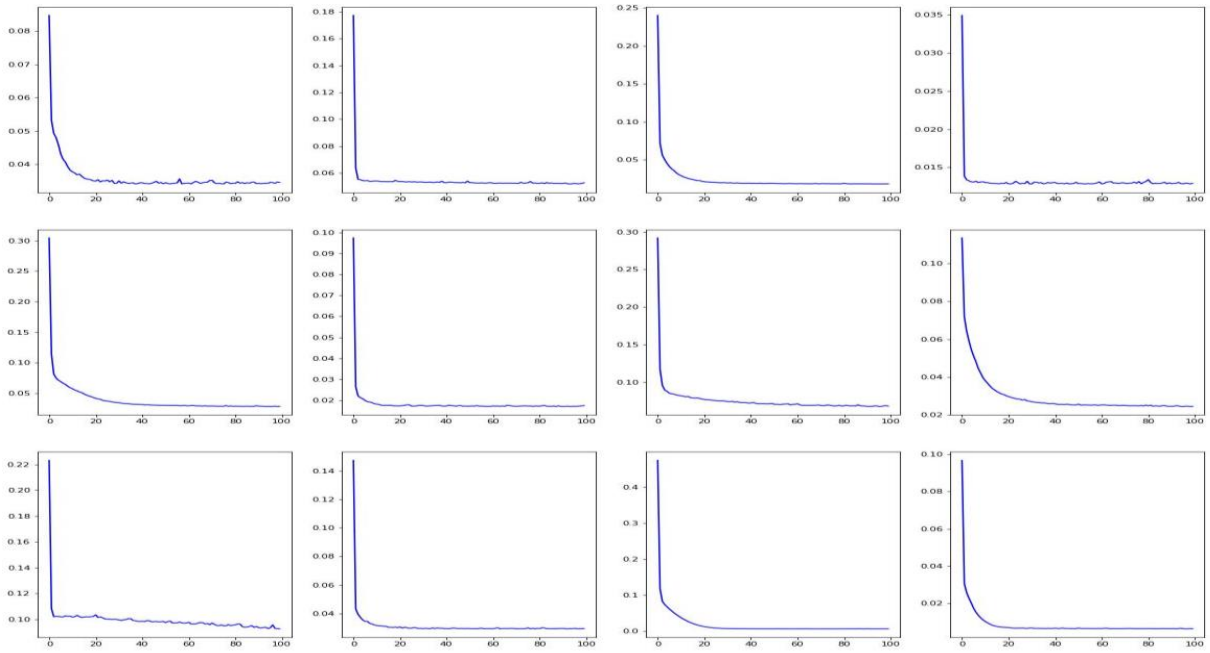
Linear Regression

1. Dataset Info

- The Iris flower data set (https://en.wikipedia.org/wiki/Iris_flower_data_set) was orga-nized by Ronald Fisher in 1936. It is a commonly used dataset for introductory machine learning concepts. You will use this dataset for use with a classification AND regression Task.

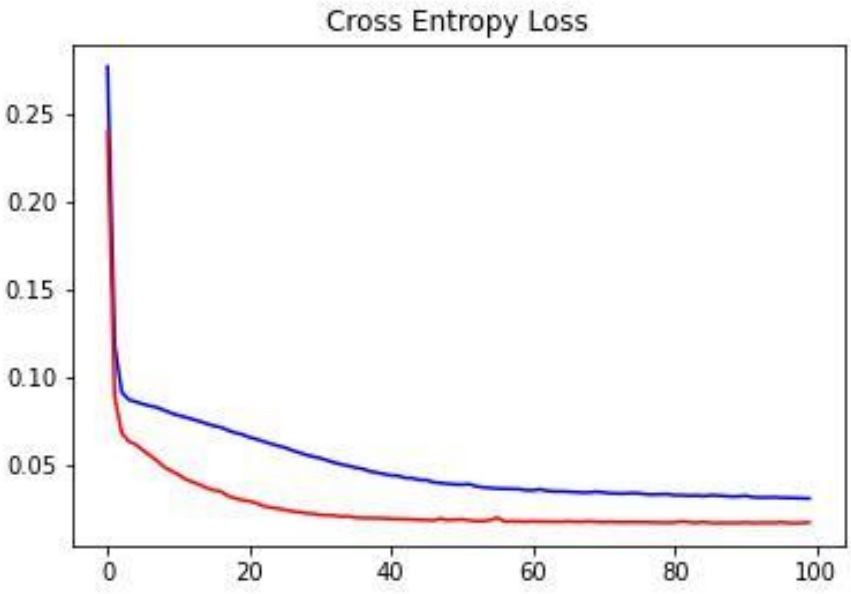
2. Linear Regression

- Fit 12 linear regression models to the training data with parameters w = [w0 , w1] for each one.
- After training the model with the data the graph of the cross-entropy loss has been plotted against the epochs



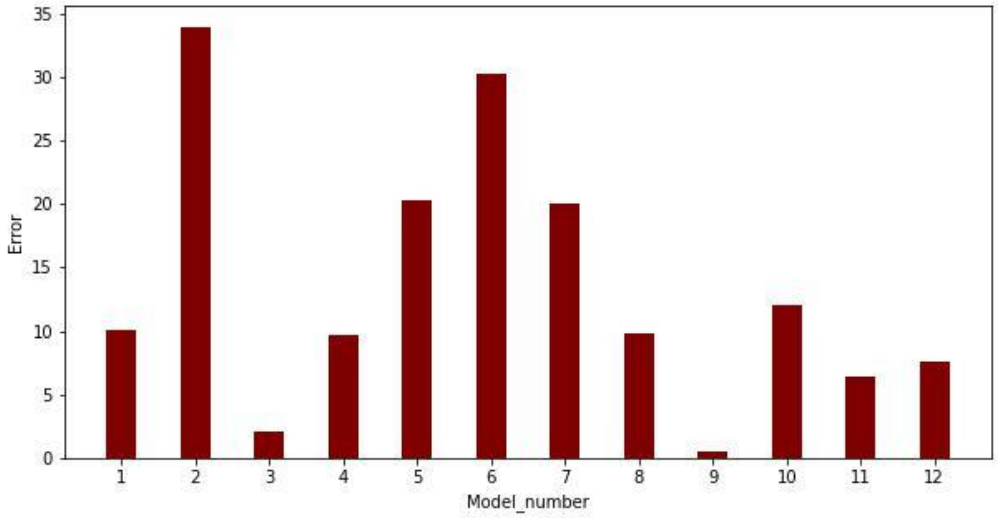
3. Regularized and Non-Regularized

- Training with same kind of dataset to both the model
- Results



- From the results it can be seen that the non Regularized model shows sign of overfitting with few areas were the graph is very sharp but when it comes to the regularized model the curve is quite smooth.

4. Testing the All the models



Model No	1	2	3	4	5	6	7	8	9	10	11	12
MSE	10	34	2.5	10	20	32	21	10	1	13	8	9

- From the results it can be seen that the model with the

Conclusion:

From the results above we can conclude that model number model number 9 has the least number of mean squared errors and the **input feature and output features associated with it are** **sepal width (cm) and petal width (cm)** respectively

Logistic regression

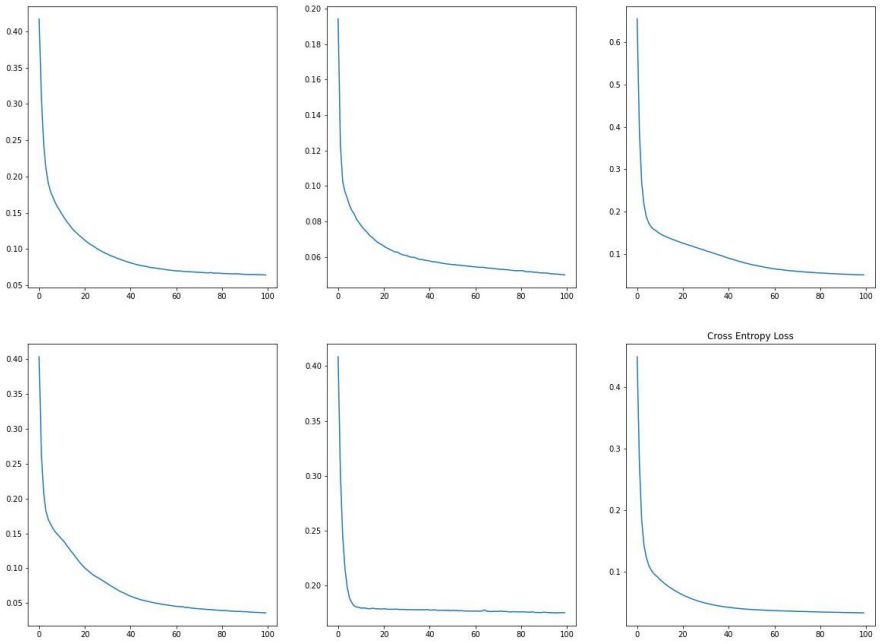
1. Logistic Regression

- In this section, you will fit 6 logistic regression models to the training data with parameters w = [w0 , w1 , w2] for each one.

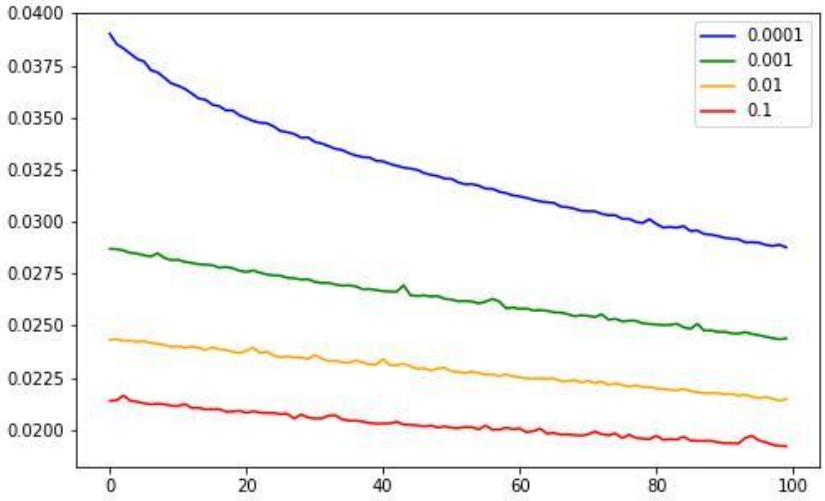
2. Training

- models should be trained using stochastic gradient descent with a batch size of 32 with the learning rate of 0.01.
- We are using mean squared error as our loss function with L2 regularization. For each model, we are training for n = 100 epochs. As each model trains, we will be recording the loss average over the batch size against the current epoch number.

3. Results



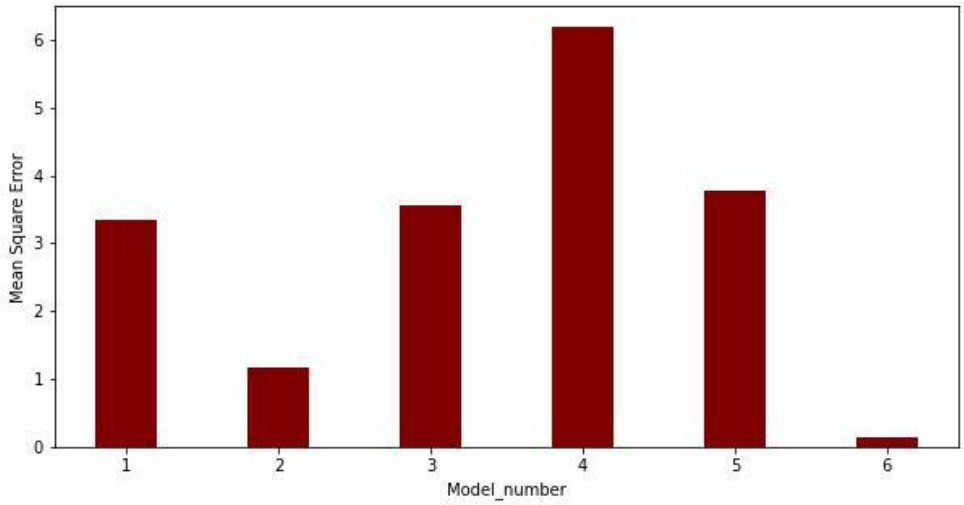
4. **Training a similar model with the learning rate of 0.1 ,0.01,0.001,0.0001**



From this we can see that the model with the learning rate of 0.0001 can be considered the most optimal because of its smooth curve and the loss associated with it is also comparable to other learning rate losses.

5. Testing

- test its performance on unseen data by evaluating the mean squared error against the test dataset that you set aside previously.



Model No	1	2	3	4	5	6
MSE	3.75	1.75	11.6	16	1	0.5

Conclusion :

The training and testing of the model is been done and the results are noted are found to be the most important feature to predict the flower sepal length (cm) & petal length (cm).