

COMP-5011-FDE Machine Learning & Neural Network

Assignment 1

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Question 1:

Repeat the computer experiment mentioned in the class, this time, however, positioning the two moons Figure to be on the edge of separability, that is, $d=0$. Determine the classification error rate produced by the algorithm over 2,000 test data points.

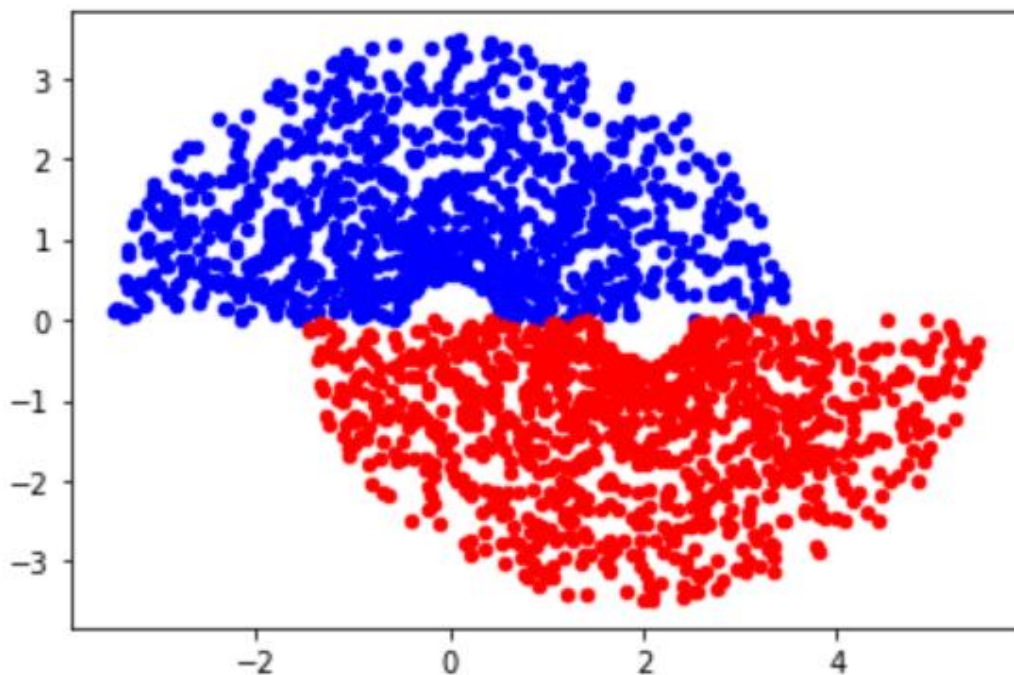
Solution:

```
Training Accuracy for the Half moon problem : 100.0 %  
Training Error Rate for Half Moon problem : 0.0 %  
Testing Accuracy for the Half moon problem : 99.9 %  
Testing Error Rate for Half Moon problem: 0.4 %
```

Screenshot from the colab notebook (1106937_ML_week1.ipynb)

```
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Testing Error Rate for Half Moon problem: 0.4 %
```

Plot for Half moon



Question 2:

Download one of the UCI dataset, reuse your own perceptron codes to get the testing accuracy of the selected dataset. The UCI dataset is available at

<https://archive.ics.uci.edu/ml/datasets.php?format=&task=cla&att=&area=&numAtt=&numIns=&type=&sort=nameUp&view=table>

Solution:

Downloaded the *Credit Approval Dataset* from the following link:

<https://archive.ics.uci.edu/ml/machine-learning-databases/credit-screening/crx.data>

Dataset: Credit Approval (dataset is attached in d2l as well)

This algorithm created takes columns a2 and a10 as the input values to classify the label a15 which is either '+' or '-'.

Accuracy:

Training Accuracy for Credit Approval (UCI dataset) :

46.058091286307054 %

Testing Accuracy for Credit Approval (UCI dataset) : 40.86538461538461

%

Screenshot taken from Google colab notebook (1106937_week1_2.ipynb):

Training Accuracy for Credit Approval (UCI dataset) : 46.058091286307054 %

Testing Accuracy for Credit Approval (UCI dataset) : 40.86538461538461 %