

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY



Course No: CSE 4238

Course Name: Soft Computing Lab

Section: C

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Submitted to:

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Completing Experiment using Bidirectional RNN:

Hyperparameters:

Embedding dimension = 100

Optimizer = Adam

Batch = 256

Learning rate = 0.001

Hidden dimension = 64

Number of Layers = 3

After Processing the Corpus:

```
['going bed night guys',  
'hey wondering whereabouts uganda guys went im going july wondering im going place xx',  
'okay take tomorrow going use one already needs new roller love typewriters',  
'afraid use 4 letter words',  
'hi xaviermedia found way get thousands twitter followers check',  
'looking forward evry song love love xoxox sophie please please reply',  
'irish german punk mix',  
'ok ok depression mentalhealth lovelife workhard smile happy beautifullife lovelife goals keepontrying summeriscoming',  
'pleasure great site use lot iphone ringtones',  
'lmao try stop visiting everyone tomorrow',  
'sun shining going studio go sea problem',  
'playing wsop ladies event tomorrow let ya know goes',  
'quote day quot walk softly carry big magnifying glass quot richard lacayo',  
'got bb bac function',  
'depression hits anxiety',  
'christian read persecution alot recieve alotsince march',  
'mmmmmm thats pretty much route im going reckons',  
'night babies got vh1 thing check pics',  
'jenn wanted say think beautiful ugh seriously love lt 3',  
'packing bags tomorrow',  
'unwin brighton hear think places least starting change like lot health conditions overall lifestyle seems key depression always lot time',  
'tropical depression gonna steal sun away mm feel lucky today emoji multiple musical notes',  
'omg thank nikki voting awesome',  
'wow thats nyc motivating thnx',  
'two favorite authors waiting sequel inferno awhile',  
'ooh pub quiz tonight completely forgot excitement paris',
```

Neural Model Architecture:

```
BiRNN(  
    (brnn): RNN(100, 64, num_layers=3, batch_first=True, bidirectional=True)  
    (fc1): Linear(in_features=128, out_features=64, bias=True)  
    (fc2): Linear(in_features=64, out_features=64, bias=True)  
    (final_layer): Linear(in_features=64, out_features=1, bias=True)  
    (dropout): Dropout(p=0.5, inplace=False)  
    (relu): ReLU()  
    (batchnorm1): BatchNorm1d(64, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)  
    (batchnorm2): BatchNorm1d(64, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)  
)
```

Training Dataset and Performance Evaluation:

Taking,

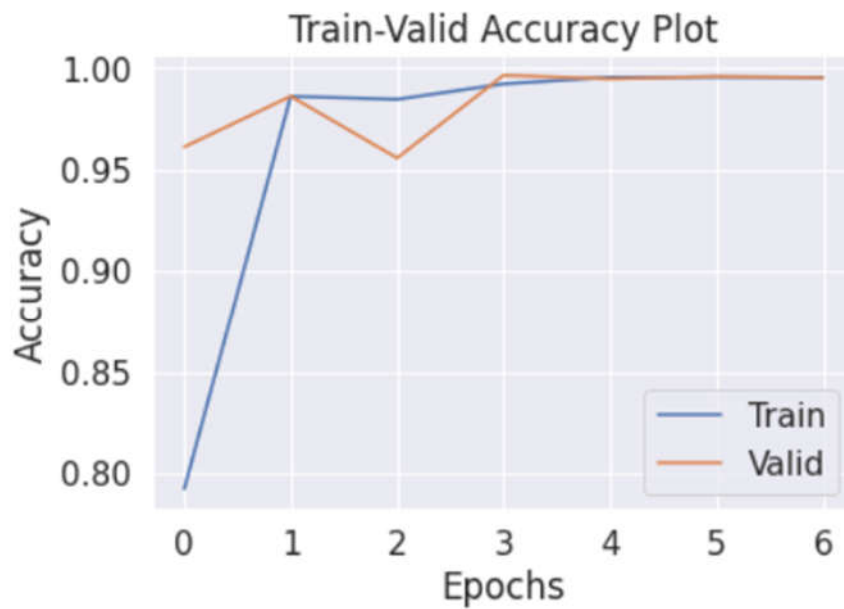
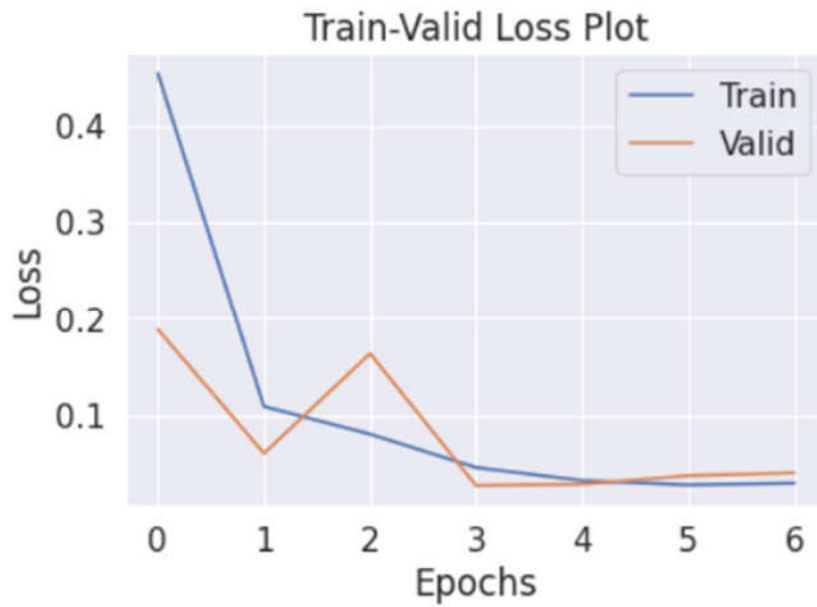
Batch size=256,

and Epochs=7.

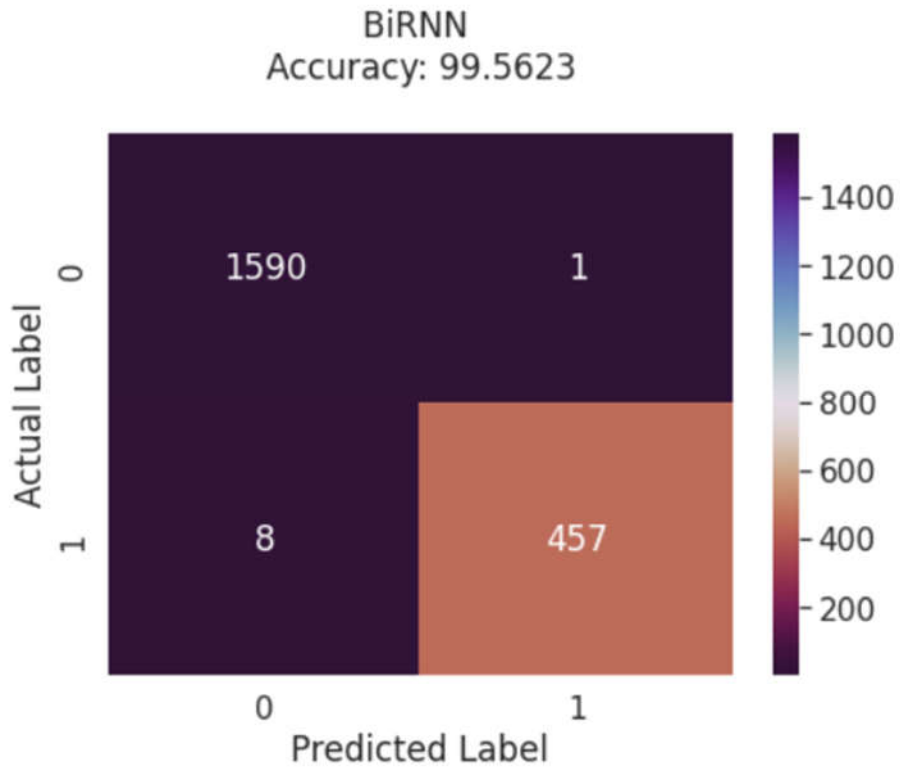
Training Dataset:

```
<-----Start Training----->  
Epoch 0--> Loss: 0.4536888702557637 Accuracy: 0.7923696610427117  
            Validation Loss: 0.18840070281709945 Validation Accuracy: 0.9610942249240122  
Epoch 1--> Loss: 0.10885860255131355 Accuracy: 0.986016111871105  
            Validation Loss: 0.06047574324267251 Validation Accuracy: 0.9860182370820668  
Epoch 2--> Loss: 0.08037521589833957 Accuracy: 0.9844961240310077  
            Validation Loss: 0.16344974083559854 Validation Accuracy: 0.9556231003039514  
Epoch 3--> Loss: 0.04590382942786583 Accuracy: 0.9920960632314941  
            Validation Loss: 0.027404952927359512 Validation Accuracy: 0.9963525835866262  
Epoch 4--> Loss: 0.03254300463371552 Accuracy: 0.9952880376956984  
            Validation Loss: 0.028785934671759605 Validation Accuracy: 0.9945288753799392  
Epoch 5--> Loss: 0.028021318193238515 Accuracy: 0.9954400364797081  
            Validation Loss: 0.03750524590057986 Validation Accuracy: 0.9957446808510638  
Epoch 6--> Loss: 0.029791689943522215 Accuracy: 0.9952880376956984  
            Validation Loss: 0.04048826691827604 Validation Accuracy: 0.9951367781155015  
<-----Finished Training----->
```

Performance Evaluation:



Confusion Matrix:



Precision, Recall and F1-score:

	precision	recall	f1-score	support
0	99.50	99.94	99.72	1591.000000
1	99.78	98.28	99.02	465.000000
accuracy	99.56	99.56	99.56	0.995623
macro avg	99.64	99.11	99.37	2056.000000
weighted avg	99.56	99.56	99.56	2056.000000

Github code links:

Experimenting using Dataset 2:

<https://github.com/Mahamudul-Hasan-Rafi/Sentiment-Analysis-From-Tweeter-Data>