Name: Nishant Dhotre
Roll No: 23CS60R48 Report

Google Drive link - link

`https://drive.google.com/drive/folders/1ZAapbPiorz13sLKSsgsIDKsXxgzonBN2?usp=sharing`

1] CNN

Classification reports:

- ' bert-base-uncased '

	precision	recall	f1-score	support
0	0.87	0.82	0.84	479
1	0.86	0.90	0.88	581
accuracy			0.86	1060
macro avg	0.86	0.86	0.86	1060
weighted avg	0.86	0.86	0.86	1060

- ' bert-base-cased '

	precision	recall	f1-score	support
0	0.81	0.87	0.84	479
1	0.89	0.83	0.86	581
accuracy			0.85	1060
macro avg	0.85	0.85	0.85	1060
weighted avg	0.85	0.85	0.85	1060

- ' covid-twitter-bert '

	precision	recall	f1-score	support
0	0.91	0.86	0.88	479
1	0.89	0.93	0.91	581
accuracy			0.89	1060
macro avg	0.90	0.89	0.89	1060
weighted avg	0.89	0.89	0.89	1060

- ' twhin-bert-base '

	precision	recall	f1-score	support
0	0.85	0.90	0.88	479
1	0.91	0.87	0.89	581
accuracy			0.88	1060
macro avg	0.88	0.89	0.88	1060
weighted avg	0.89	0.88	0.89	1060

- ' SocBERT-base '

	precision	recall	f1-score	support
0	0.90	0.84	0.87	479
1	0.87	0.93	0.90	581
accuracy			0.89	1060
macro avg	0.89	0.88	0.88	1060
weighted avg	0.89	0.89	0.89	1060

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Best parameters:

- **Number of epochs**: 4
- **Batch size**: 32, used in the DataLoader for batch processing
- **Learning rate**: Default for **optim.Adam** (usually 0.001 if not specified)
- **Optimizer**: Adam
- **Loss function**: CrossEntropyLoss
- **Convolution layers**: Two **Conv1d** layers with 128 and 64 out_channels respectively, kernel_size=3, padding=1
- **Pooling layer**: MaxPool1d with kernel_size=2, stride=2
- **Fully connected layers**: Two linear layers with output sizes 256 and the number of classes
- **Activation function**: ReLU used in convolutional and fully connected layers
- Additionally, for tweets related to "covid-twitter", the embedding dimension changes to 1024, affecting the input size to the first fully connected layer.

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1] DNN

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	precision	recall	f1-score	support
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1	0.86	0.90	0.88	581
accuracy			0.86	1060
macro avg	0.86	0.86	0.86	1060
weighted avg	0.86	0.86	0.86	1060

- ' bert-base-cased '

	precision	recall	f1-score	support
0	0.85	0.73	0.79	479
1	0.80	0.90	0.84	581
accuracy			0.82	1060
macro avg	0.83	0.81	0.81	1060
weighted avg	0.82	0.82	0.82	1060

- ' covid-twitter-bert '

	precision	recall	f1-score	support
0	0.93	0.88	0.90	479
1	0.91	0.94	0.92	581
accuracy			0.91	1060
macro avg	0.92	0.91	0.91	1060
weighted avg	0.91	0.91	0.91	1060

- ' twhin-bert-base '

	precision	recall	f1-score	support
0	0.85	0.84	0.85	479
1	0.87	0.88	0.88	581
accuracy			0.86	1060
macro avg	0.86	0.86	0.86	1060
weighted avg	0.86	0.86	0.86	1060

- ' SocBERT-base '

	precision	recall	f1-score	support
0	0.89	0.83	0.86	479
1	0.87	0.91	0.89	581
accuracy			0.88	1060
macro avg	0.88	0.87	0.88	1060
weighted avg	0.88	0.88	0.88	1060:

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Best parameters:

- **Embedding Dimension**: 768 by default, changed to 1024 for 'covid-twitter-bert'.
- **Layer Sizes**: The model consists of linear layers with sizes 128, 128, 100, 64, and an output layer of size 1.
- **Dropout Rates**: 20% after the first hidden layer and again before the output layer.
- **Number of Epochs**: 30.
- **Loss Function**: Binary Cross-Entropy Loss (BCELoss) for binary classification.
- **Optimizer**: Adam with a learning rate of 0.001 and weight decay of 1e-5.
- Additionally, for tweets related to "covid-twitter", the embedding dimension changes to 1024, affecting the input size to the first fully connected layer.