NLP

Assignment4 Report

Prepared by

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- The required task is related to text classification using a convolutional neural network, The data set is "**Sentiment140**", which is a data set containing tweets from Twitter. Each tweet has a lable, either positive with id = 0 or negative with id = 4, The goal is to classify these tweets into positive/negative.

- **Dataset :** Sentiment140

	sentiment	ids	date	flag	user	text
0	0	1467810369	Mon Apr 06 22:19:45 PDT 2009	NO_QUERY	_TheSpecialOne_	@switchfoot http://twitpic.com/2y1zl - Awww, t...

- **Structure and results of the models used :**

- Model 1 : simple arc model

Layer (type)	Output Shape	Param #
conv1d (Conv1D)	(None, 23, 32)	25,632
max_pooling1d (MaxPooling1D)	(None, 11, 32)	0
flatten (Flatten)	(None, 352)	0
dense (Dense)	(None, 64)	22,592
dense_1 (Dense)	(None, 1)	65

Total params: 48,289 (188.63 KB)

Trainable params: 48,289 (188.63 KB)

Non-trainable params: 0 (0.00 B)

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516/516 ━━━━━━━━━━━━━━━━━━━━ 1s 2ms/step
              precision    recall  f1-score   support

           0       0.62      0.63      0.62      8218
           1       0.63      0.61      0.62      8277

    accuracy                           0.62     16495
   macro avg       0.62      0.62      0.62     16495
weighted avg       0.62      0.62      0.62     16495
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" Used Word2Vec For Word Embedding "

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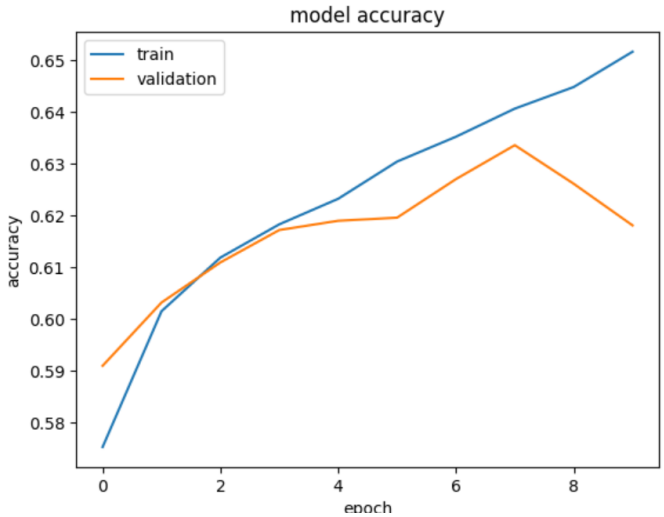

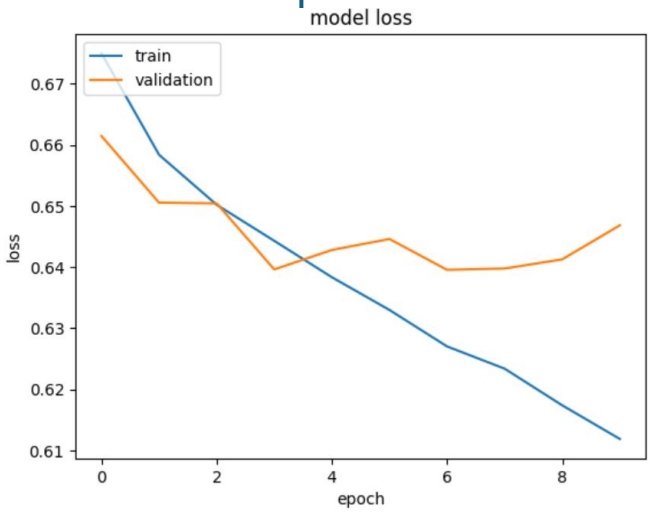

- Model 2 : INCEPTION_MODEL

Layer (type)	Output Shape	Param #	Connected to
input_layer_1 (InputLayer)	(None, 30, 100)	0	-
conv1d_1 (Conv1D)	(None, 30, 32)	9,632	input_layer_1[0]…
max_pooling1d_1 (MaxPooling1D)	(None, 15, 32)	0	conv1d_1[0][0]
max_pooling1d_2 (MaxPooling1D)	(None, 15, 32)	0	max_pooling1d_1[…
conv1d_2 (Conv1D)	(None, 15, 32)	1,056	max_pooling1d_1[…
conv1d_3 (Conv1D)	(None, 15, 32)	3,104	max_pooling1d_1[…
conv1d_4 (Conv1D)	(None, 15, 32)	5,152	max_pooling1d_1[…
conv1d_5 (Conv1D)	(None, 15, 32)	1,056	max_pooling1d_2[…
concatenate (Concatenate)	(None, 15, 128)	0	conv1d_2[0][0], conv1d_3[0][0], conv1d_4[0][0], conv1d_5[0][0]
max_pooling1d_3 (MaxPooling1D)	(None, 15, 128)	0	concatenate[0][0]
conv1d_6 (Conv1D)	(None, 15, 64)	8,256	concatenate[0][0]
conv1d_7 (Conv1D)	(None, 15, 64)	24,640	concatenate[0][0]
conv1d_8 (Conv1D)	(None, 15, 64)	41,024	concatenate[0][0]
conv1d_9 (Conv1D)	(None, 15, 64)	8,256	max_pooling1d_3[…
concatenate_1 (Concatenate)	(None, 15, 256)	0	conv1d_6[0][0], conv1d_7[0][0], conv1d_8[0][0], conv1d_9[0][0]

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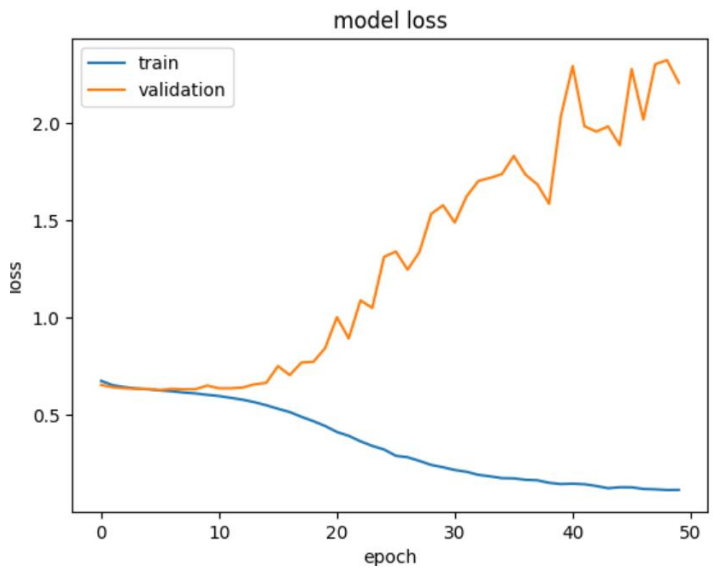
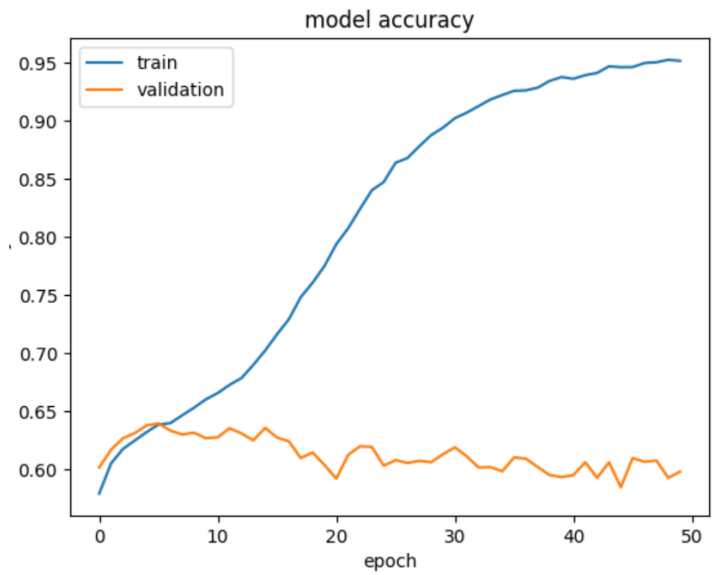
- Model 2 : INCEPTION_MODEL



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516/516 ━━━━━━━━━━━━━━━━━━━━ 3s 5ms/step
              precision    recall  f1-score   support

           0       0.60      0.60      0.60      8218
           1       0.60      0.60      0.60      8277

    accuracy                           0.60     16495
   macro avg       0.60      0.60      0.60     16495
weighted avg       0.60      0.60      0.60     16495
```

“ Used Word2Vec For Word Embedding “

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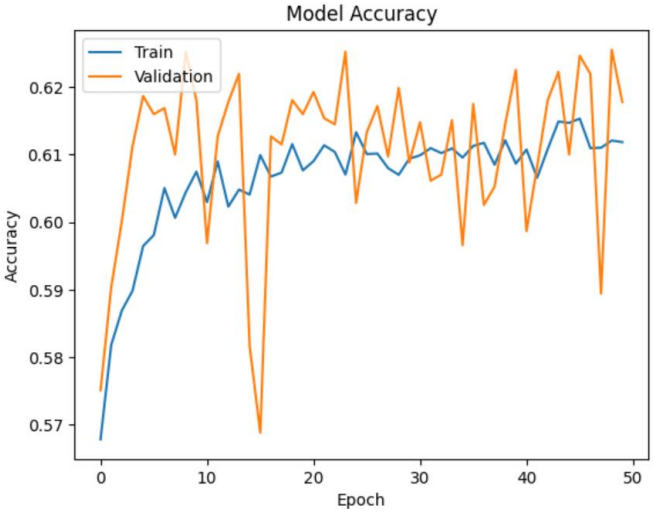
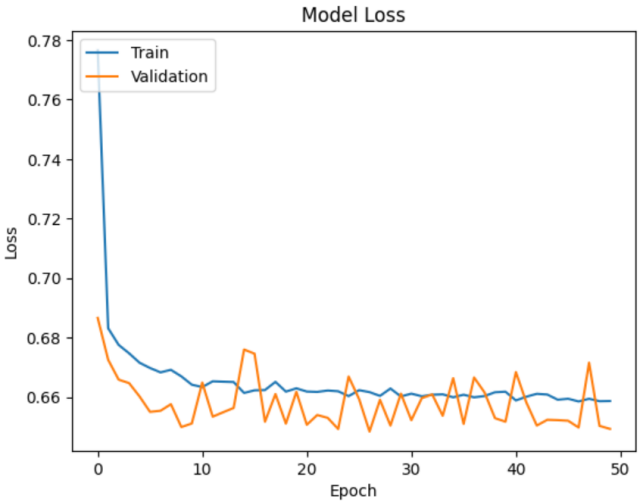
- Model 3 : regularized dropout inception model “same Architecture”





	precision	recall	f1-score	support
0	0.61	0.67	0.64	8218
1	0.64	0.57	0.60	8277
accuracy			0.62	16495
macro avg	0.62	0.62	0.62	16495
weighted avg	0.62	0.62	0.62	16495

“ Used Word2Vec For Word Embedding “

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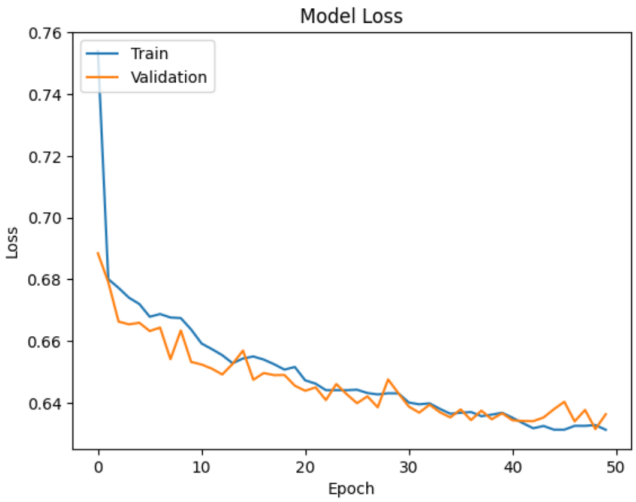
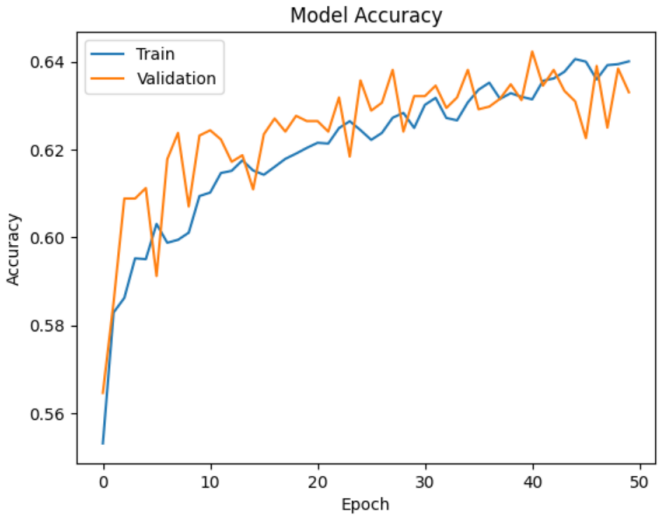
- Model 4 : Learning Rate Schedulerinception model “same Architecture”





516/516 ━━━━━━━━━━━━━━━━━━━━ 2s 3ms/step

	precision	recall	f1-score	support
0	0.61	0.72	0.66	8218
1	0.66	0.55	0.60	8277
accuracy			0.63	16495
macro avg	0.64	0.64	0.63	16495
weighted avg	0.64	0.63	0.63	16495

“ Used Word2Vec For Word Embedding “

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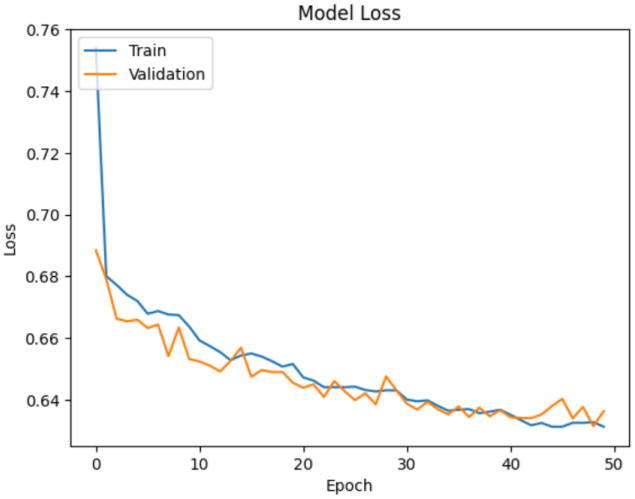
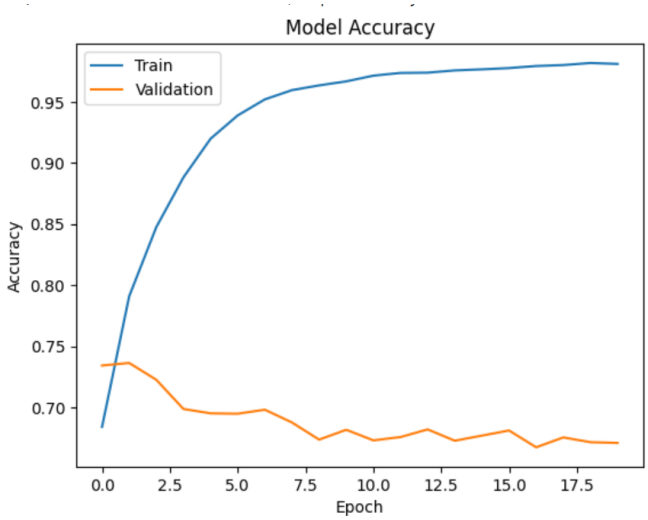
- Model 5 : Embeding Layer inception model “same Architecture”

Layer (type)	Output Shape	Param #	Connected to
input_layer_14 (InputLayer)	(None, 30)	0	-
embedding_10 (Embedding)	(None, 30, 100)	1,000,000	input_layer_14[0…





516/516 ━━━━━━━━━━━━━━━━━━━━ 2s 3ms/step

	precision	recall	f1-score	support
0	0.68	0.66	0.67	8218
1	0.67	0.69	0.68	8277
accuracy			0.68	16495
macro avg	0.68	0.68	0.68	16495
weighted avg	0.68	0.68	0.68	16495

“ Used Embeding Layer For Word Embedding “