Convolutional Neural Network

Image Classification Task

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MNIST Dataset

Since the full dataset took a very long time to run and my pc wasn't able to handle the pressure, I used a smaller portion of the dataset to train my model and to check if my model is actually learning.

Architecture used:

Conv 6 5 1 2
ReLU
Pool 2 2
Flat
FC 2
Softmax

Total epochs : 10
Batch size : 50
Learning rate : 0.001

Epoch - 1

	Validation set	Training set
Loss	0.67	0.68
Accuracy	0.62	0.58
Macro F1 score	0.54	0.49

Epoch - 2

	Validation set	Training set
Loss	0.59	0.61
Accuracy	0.81	0.76
Macro F1 score	0.81	0.75

Epoch - 3

	Validation set	Training set
Loss	0.53	0.55
Accuracy	0.91	0.84
Macro F1 score	0.90	0.84

Epoch - 4

	Validation set	Training set
Loss	0.49	0.51
Accuracy	0.94	0.90
Macro F1 score	0.94	0.90

Epoch - 5

	Validation set	Training set
Loss	0.44	0.47
Accuracy	0.96	0.96
Macro F1 score	0.96	0.96

Epoch - 6

	Validation set	Training set
Loss	0.41	0.43
Accuracy	0.97	0.98
Macro F1 score	0.97	0.98

Epoch - 7

	Validation set	Training set
Loss	0.38	0.40
Accuracy	0.98	0.98
Macro F1 score	0.98	0.98

Epoch - 8

|	Validation set	Training set
Loss	0.35	0.37
Accuracy	0.98	0.98
Macro F1 score	0.98	0.98

Epoch - 9

	Validation set	Training set
Loss	0.32	0.35
Accuracy	0.98	0.98
Macro F1 score	0.98	0.98

Epoch - 10

	Validation set	Training set
Loss	0.30	0.32
Accuracy	0.98	0.98
Macro F1 score	0.98	0.98

Graphs

loss

f1 score

accuracy
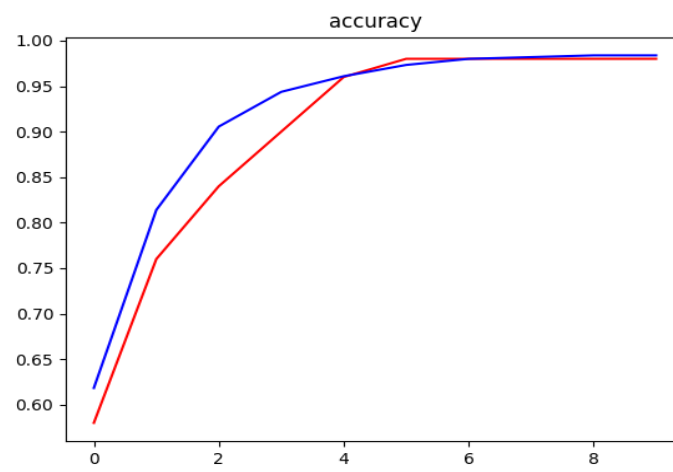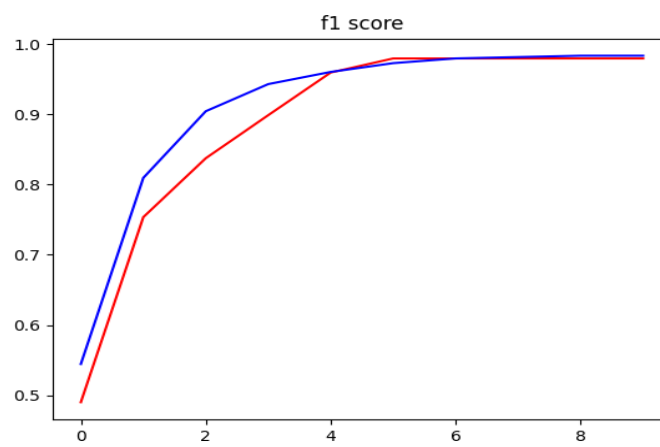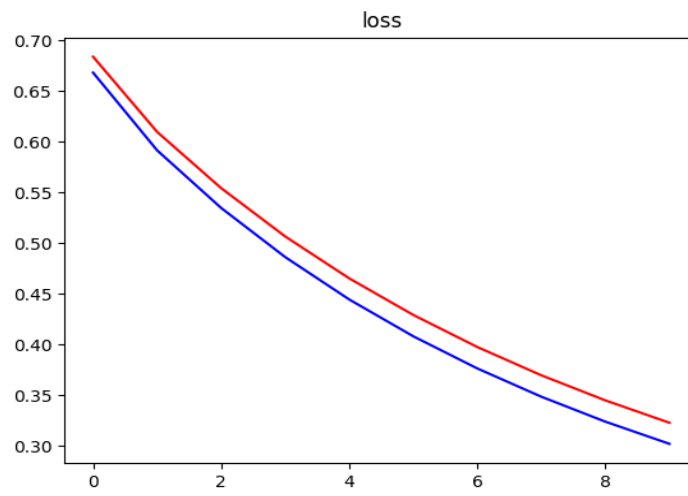
CIFAR-10 Dataset

Since the full dataset took a very long time to run and my pc wasn't able to handle the pressure, I used a smaller portion of the dataset to train my model and to check if my model is actually learning.

Architecture used:

Conv 6 5 1 2
ReLU
Pool 2 2
Flat
FC 2
Softmax

Total epochs : 10
Batch size : 500
Learning rate : 0.001

Epoch - 1

	Validation set	Training set
Loss	0.71	0.70
Accuracy	0.49	0.49
Macro F1 score	0.49	0.49

Epoch - 2

	Validation set	Training set
Loss	0.71	0.70
Accuracy	0.53	0.52
Macro F1 score	0.53	0.52

Epoch - 3

	Validation set	Training set
Loss	0.70	0.70
Accuracy	0.56	0.54
Macro F1 score	0.55	0.53

Epoch - 4

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.56
Macro F1 score	0.54	0.55

Epoch - 5

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.56
Macro F1 score	0.53	0.54

Epoch - 6

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.55	0.57
Macro F1 score	0.53	0.55

Epoch - 7

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.58
Macro F1 score	0.53	0.55

Epoch - 8

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.58
Macro F1 score	0.53	0.55

Epoch - 9

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.58
Macro F1 score	0.53	0.55

Epoch - 10

	Validation set	Training set
Loss	0.70	0.69
Accuracy	0.56	0.58
Macro F1 score	0.53	0.55

Graphs

loss

f1 score

accuracy