Report On CNN Offline

Architecture used :

1. Convolution layer(6,5,0,1)
2. Relu
3. maxpool(2,2)
4. Relu
5. FullyConnected(84)
6. FullyConnected(10)
7. Relu
8. Soft-max

At different learning rates training loss, validation loss, validation accuracy and macro-f1 are reported below :

For Learning rate = 0.01

```
Epoch --- 3 Training Loss --- 138.70876004816503

Epoch --- 3 validation Loss --- 2.267918563027607

Epoch --- 3 Accuracy Score --- 0.5041782729805014

Epoch --- 3 f1 score --- 0.49305987583619004
```

```
Epoch --- 4 Training Loss --- 138.11710921960847

Epoch --- 4 validation Loss --- 2.25758761682898

Epoch --- 4 Accuracy Score --- 0.5236768802228412

Epoch --- 4 f1 score --- 0.5165604137156676
```

Loss decreased with epoch and accuracy increased with increasing epoch
This was computed for total epoch 5.

For Learning rate = 0.001

```
Epoch --- 3 Training Loss --- 2.3009931968803805

Epoch --- 3 validation Loss --- 2.3005643418697983

Epoch --- 3 Accuracy Score --- 0.15041782729805014

Epoch --- 3 f1 score --- 0.07399925782736314

Epoch --- 3 Confusion Matrix ---
[[ 0 16  0  0 12  1  0  8  0  0]
 [ 0 15  0  0  5  3  1 13  0  0]
 [ 0 14  0  0  3  1  0 17  2  0]
 [ 0  9  0  0  8  0  0 18  0  0]
 [ 0 12  0  0 14  1  0  8  0  0]
 [ 0  5  0  0 10  1  0 20  0  0]
 [ 1  8  0  0  8  1  0 17  0  0]
 [ 0  4  0  0  8  0  0 24  0  0]
 [ 0 12  0  0 10  0  0 14  0  0]
 [ 0 11  1  0  8  2  0 13  0  0]]
```

```
Epoch --- 4 Training Loss --- 2.3005350318682805

Epoch --- 4 validation Loss --- 2.3001080658614996

Epoch --- 4 Accuracy Score --- 0.15598885793871867

Epoch --- 4 f1 score --- 0.0739090939090939

Epoch --- 4 Confusion Matrix ---
[[ 0 17  0  0 12  0  0  8  0  0]
 [ 0 15  0  0  5  3  1 13  0  0]
 [ 0 14  0  0  3  1  0 17  2  0]
 [ 0  9  0  0  9  0  0 17  0  0]
 [ 0 11  0  0 17  1  0  6  0  0]
 [ 0  5  0  0 10  0  0 21  0  0]
 [ 1  8  0  0  9  1  0 16  0  0]
 [ 0  4  0  0  8  0  0 24  0  0]
 [ 0 12  0  0 10  0  0 14  0  0]
 [ 0 11  1  0  8  2  0 13  0  0]]
```