

HW4 – Deep learning

Hidden Layers = 3

Number of neurons = 81

Batch Size = 16

Learning Rate = 0.005

Epochs = 70

Alpha = 1e-06

Epochs = 70

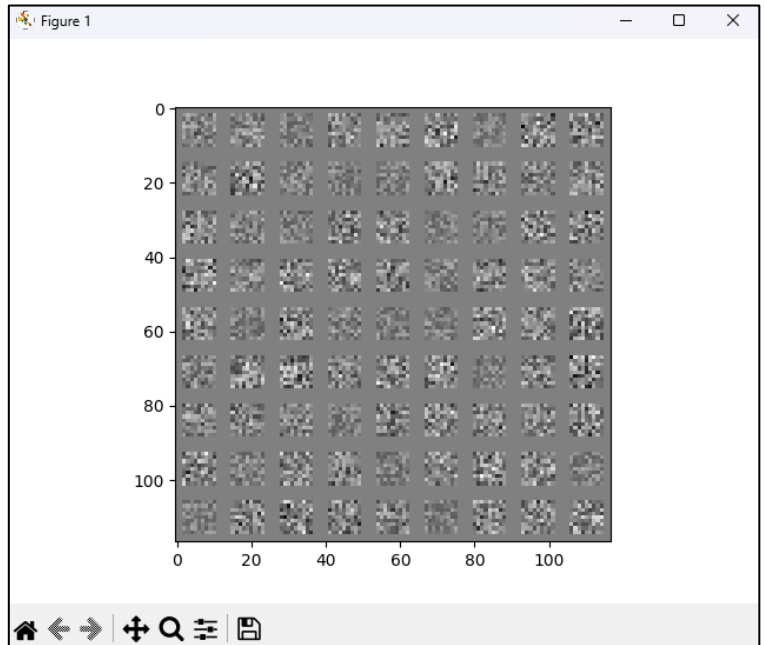
RESULTS:

```
epoch 59
Loss on epoch: 0.3681038310816062 Accuracy: 88.79166666666667
epoch 60
Loss on epoch: 0.36160230539203925 Accuracy: 88.79166666666667
epoch 61
Loss on epoch: 0.3649138949076127 Accuracy: 88.80833333333334
epoch 62
Loss on epoch: 0.3668967773759183 Accuracy: 88.88333333333334
epoch 63
Loss on epoch: 0.36965639474551765 Accuracy: 88.88333333333334
epoch 64
Loss on epoch: 0.37214890692280483 Accuracy: 88.78333333333333
epoch 65
Loss on epoch: 0.3742978232311488 Accuracy: 88.78333333333333
epoch 66
Loss on epoch: 0.3772278147252683 Accuracy: 88.75
epoch 67
Loss on epoch: 0.3812414969384233 Accuracy: 88.8
epoch 68
Loss on epoch: 0.38323838464385485 Accuracy: 88.78333333333333
epoch 69
Loss on epoch: 0.3864690270695527 Accuracy: 88.71666666666667
```

```
The Best Hyper Parameters:
Best_Hidden_Layers: 3
Best_hidden_num: 81
Best_epochs: 70
Best_batch_size: 16
Best_learning_rate: 0.005
Best_alpha: 1e-06
Best_accuracy on validation data : 88.94166666666666
```

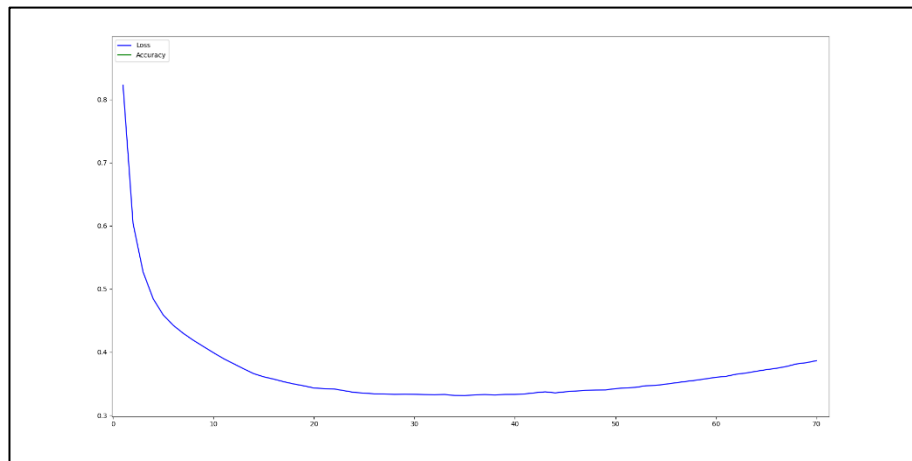
```
loss value on best hyperparameters: 0.3421147290727392
```

```
Accuracy on Test data: 88.12
```



Loss Plot

(over 70 epochs)



Accuracy Plot:

(over 70 epochs)

