
No. of training egs: 30000.0

Epoch 0:

Training Accuracy: 10.786666666666667

Test Accuracy: 10.08

Epoch 1:

Training Accuracy: 91.65666666666667

Test Accuracy: 74.99

Epoch 2:

Training Accuracy: 96.03666666666668

Test Accuracy: 83.14

Epoch 3:

Training Accuracy: 97.10666666666667

Test Accuracy: 89.83

Epoch 4:

Training Accuracy: 97.74666666666667

Test Accuracy: 91.77

Epoch 5:

Training Accuracy: 98.14

Test Accuracy: 92.65

Epoch 6:

Training Accuracy: 98.43666666666667

Test Accuracy: 93.39

Epoch 7:

Training Accuracy: 98.62666666666667

Test Accuracy: 93.25

Epoch 8:

Training Accuracy: 98.81

Test Accuracy: 93.82000000000001

Epoch 9:

Training Accuracy: 98.94666666666667

Test Accuracy: 94.17

Epoch 10:

Training Accuracy: 99.09333333333333

Test Accuracy: 94.45

Epoch 11:

Training Accuracy: 99.20666666666666

Test Accuracy: 94.74000000000001

Epoch 12:

Training Accuracy: 99.28666666666666

Test Accuracy: 94.77

Epoch 13:

Training Accuracy: 99.34666666666668

Test Accuracy: 94.73

Epoch 14:

Training Accuracy: 99.38

Test Accuracy: 94.78999999999999

Epoch 15:

Training Accuracy: 99.42

Test Accuracy: 94.91000000000001

Epoch 16:

Training Accuracy: 99.45666666666668

Test Accuracy: 95.05

Epoch 17:

Training Accuracy: 99.48333333333333

Test Accuracy: 95.12

Epoch 18:

Training Accuracy: 99.50666666666666

Test Accuracy: 95.27

Epoch 19:

Training Accuracy: 99.53999999999999

Test Accuracy: 95.32000000000001

Epoch 20:

Training Accuracy: 99.57000000000001

Test Accuracy: 95.43

Epoch 21:

Training Accuracy: 99.58333333333333

Test Accuracy: 95.47

Epoch 22:

Training Accuracy: 99.61

Test Accuracy: 95.59

Epoch 23:

Training Accuracy: 99.62

Test Accuracy: 95.67

Epoch 24:
Training Accuracy: 99.63666666666666
Test Accuracy: 95.74000000000001

Epoch 25:
Training Accuracy: 99.64666666666666
Test Accuracy: 95.76

Epoch 26:
Training Accuracy: 99.66333333333334
Test Accuracy: 95.78999999999999

Epoch 27:
Training Accuracy: 99.67333333333333
Test Accuracy: 95.77

Epoch 28:
Training Accuracy: 99.67666666666666
Test Accuracy: 95.75

Epoch 29:
Training Accuracy: 99.69
Test Accuracy: 95.73

Epoch 30:
Training Accuracy: 99.70333333333333
Test Accuracy: 95.75

Epoch 31:
Training Accuracy: 99.71
Test Accuracy: 95.77

Epoch 32:
Training Accuracy: 99.72333333333333
Test Accuracy: 95.76

Epoch 33:
Training Accuracy: 99.73666666666666
Test Accuracy: 95.77

Epoch 34:
Training Accuracy: 99.74333333333333
Test Accuracy: 95.83

Epoch 35:
Training Accuracy: 99.75
Test Accuracy: 95.78

Epoch 36:
Training Accuracy: 99.73666666666666

Test Accuracy: 95.81

Epoch 37:

Training Accuracy: 99.75666666666667

Test Accuracy: 95.82000000000001

Epoch 38:

Training Accuracy: 99.76

Test Accuracy: 95.84

Epoch 39:

Training Accuracy: 99.77666666666667

Test Accuracy: 95.89999999999999

Epoch 40:

Training Accuracy: 99.78666666666666

Test Accuracy: 95.85000000000001

Epoch 41:

Training Accuracy: 99.78333333333333

Test Accuracy: 95.76

Epoch 42:

Training Accuracy: 99.78666666666666

Test Accuracy: 95.67999999999999

Epoch 43:

Training Accuracy: 99.78666666666666

Test Accuracy: 95.71

Epoch 44:

Training Accuracy: 99.79

Test Accuracy: 95.71

Epoch 45:

Training Accuracy: 99.79

Test Accuracy: 95.7

Epoch 46:

Training Accuracy: 99.79

Test Accuracy: 95.71

Epoch 47:

Training Accuracy: 99.79

Test Accuracy: 95.71

Epoch 48:

Training Accuracy: 99.8

Test Accuracy: 95.7

Epoch 49:

Training Accuracy: 99.81

Test Accuracy: 95.73

Epoch 50:

Training Accuracy: 99.81333333333333

Test Accuracy: 95.74000000000001

Confusion matrix on test data after training:

```

[[ 954    0    4    1    0    6    3    0    6    6]
 [   0 1106    4    1    1    9    3    3    8    0]
 [   1    1  991    1    2    6    2    7   19    2]
 [   3    0   10  933    2   28    1    4   22    7]
 [   1    1    3    1  950    0    5    2    1   18]
 [   2    0    2    7    1  868    3    1    8    0]
 [   5    2    4    1    3   17  913    0   12    1]
 [   1    1   12    1    7    4    0  975   11   16]
 [   3    1    4    0    4   10    6    2  942    2]
 [   2    1    1    4   19    9    1    4   26  942]]

```

No. of training egs: 15000.0

Epoch 0:

Training Accuracy: 10.0

Test Accuracy: 9.82

Epoch 1:

Training Accuracy: 88.94666666666666

Test Accuracy: 69.46

Epoch 2:

Training Accuracy: 95.22666666666667

Test Accuracy: 85.96000000000001

Epoch 3:

Training Accuracy: 96.79333333333334

Test Accuracy: 89.22

Epoch 4:

Training Accuracy: 97.60666666666667

Test Accuracy: 91.03

Epoch 5:

Training Accuracy: 98.2

Test Accuracy: 91.99000000000001

Epoch 6:

Training Accuracy: 98.59333333333333

Test Accuracy: 92.21000000000001

Epoch 7:
Training Accuracy: 98.82
Test Accuracy: 92.63

Epoch 8:
Training Accuracy: 98.99333333333334
Test Accuracy: 93.06

Epoch 9:
Training Accuracy: 99.19333333333333
Test Accuracy: 93.42

Epoch 10:
Training Accuracy: 99.32666666666667
Test Accuracy: 93.56

Epoch 11:
Training Accuracy: 99.44
Test Accuracy: 93.75

Epoch 12:
Training Accuracy: 99.48
Test Accuracy: 93.81

Epoch 13:
Training Accuracy: 99.51333333333334
Test Accuracy: 93.83

Epoch 14:
Training Accuracy: 99.56666666666666
Test Accuracy: 93.87

Epoch 15:
Training Accuracy: 99.6
Test Accuracy: 93.82000000000001

Epoch 16:
Training Accuracy: 99.64666666666666
Test Accuracy: 93.94

Epoch 17:
Training Accuracy: 99.67333333333333
Test Accuracy: 94.06

Epoch 18:
Training Accuracy: 99.69333333333333
Test Accuracy: 94.24

Epoch 19:

Training Accuracy: 99.70666666666666
Test Accuracy: 94.34

Epoch 20:
Training Accuracy: 99.72666666666666
Test Accuracy: 94.49

Epoch 21:
Training Accuracy: 99.72666666666666
Test Accuracy: 94.55

Epoch 22:
Training Accuracy: 99.74
Test Accuracy: 94.61

Epoch 23:
Training Accuracy: 99.76666666666667
Test Accuracy: 94.67

Epoch 24:
Training Accuracy: 99.79333333333334
Test Accuracy: 94.69999999999999

Epoch 25:
Training Accuracy: 99.81333333333333
Test Accuracy: 94.67999999999999

Epoch 26:
Training Accuracy: 99.82
Test Accuracy: 94.74000000000001

Epoch 27:
Training Accuracy: 99.82
Test Accuracy: 94.69999999999999

Epoch 28:
Training Accuracy: 99.83999999999999
Test Accuracy: 94.72

Epoch 29:
Training Accuracy: 99.83333333333333
Test Accuracy: 94.81

Epoch 30:
Training Accuracy: 99.83333333333333
Test Accuracy: 94.81

Epoch 31:
Training Accuracy: 99.83333333333333
Test Accuracy: 94.78999999999999

Epoch 32:
Training Accuracy: 99.83999999999999
Test Accuracy: 94.78999999999999

Epoch 33:
Training Accuracy: 99.84666666666666
Test Accuracy: 94.76

Epoch 34:
Training Accuracy: 99.86
Test Accuracy: 94.73

Epoch 35:
Training Accuracy: 99.89333333333333
Test Accuracy: 94.78

Epoch 36:
Training Accuracy: 99.9
Test Accuracy: 94.85

Epoch 37:
Training Accuracy: 99.89333333333333
Test Accuracy: 94.89

Epoch 38:
Training Accuracy: 99.9
Test Accuracy: 94.78

Epoch 39:
Training Accuracy: 99.91333333333333
Test Accuracy: 94.82000000000001

Epoch 40:
Training Accuracy: 99.90666666666667
Test Accuracy: 94.8

Epoch 41:
Training Accuracy: 99.91333333333333
Test Accuracy: 94.75

Epoch 42:
Training Accuracy: 99.92666666666666
Test Accuracy: 94.75

Epoch 43:
Training Accuracy: 99.92
Test Accuracy: 94.75

Epoch 44:

File - unknown

Training Accuracy: 99.92
Test Accuracy: 94.71000000000001

Epoch 45:
Training Accuracy: 99.93333333333332
Test Accuracy: 94.74000000000001

Epoch 46:
Training Accuracy: 99.92
Test Accuracy: 94.72

Epoch 47:
Training Accuracy: 99.92666666666666
Test Accuracy: 94.67999999999999

Epoch 48:
Training Accuracy: 99.92666666666666
Test Accuracy: 94.69

Epoch 49:
Training Accuracy: 99.92666666666666
Test Accuracy: 94.69

Epoch 50:
Training Accuracy: 99.92666666666666
Test Accuracy: 94.69

Confusion matrix on test data after training:

```
[[ 955    0    3    0    0    2    2    2   13    3]
 [   1 1113    3    4    0    3    2    2    6    1]
 [   4    0  985    3    0    4    4   10   20    2]
 [   2    1   13  876    4   46    0    5   51   12]
 [   0    1    7    0  929    2    3    1    9   30]
 [   3    1    1    1    0  866    2    2   13    3]
 [   9    2    2    0    8   14  898    0   24    1]
 [   2    1   20    5    6    1    2  964    9   18]
 [   5    0    3    2    3    9    4    2  940    6]
 [   4    3    1    6   13    5    1    5   28  943]]
```

Run time: 35.47754128376643 min

Process finished with exit code 0