

**دانیال ملک محمد - 94100092-**  
**تمرین چهارم عملی - یادگیری ماشین**

## سوال 1.3

(ب)

**:C\_neg=C\_positive=1**

```
Confusion_matrix:
[[671.  50.]
 [  1.  1.]]
Precision Negative    0.9306518723994452
Recall   Negative    0.9985119047619048
Precision Positive    0.5
Recall   Positive    0.0196078431372549
```

[HW4.py]

**:C relative**

```
Confusion_matrix:
[[517.  18.]
 [155.  33.]]
Precision Negative    0.9663551401869159
Recall   Negative    0.7693452380952381
Precision Positive    0.17553191489361702
Recall   Positive    0.6470588235294118
```

[HW4.py]

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## Non Kernel

```
Confusion_matrix:
[[240.  30.]
 [ 24. 246.]]
Precision Negative    0.8888888888888888
Recall   Negative    0.9090909090909091
Precision Positive    0.9111111111111111
Recall   Positive    0.8913043478260869
Accuracy :           0.9
```

[HW4\_2.py]

## RBF Kernel

```
Confusion_matrix:
[[263.   2.]
 [   1. 274.]]
Precision Negative    0.9924528301886792
Recall   Negative    0.9962121212121212
Precision Positive    0.9963636363636363
Recall   Positive    0.9927536231884058
Accuracy :           0.9944444444444445
```

[HW4\_3.py]

### سوال 3.4

@@  
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Epoch : 60000

Loss on Train : 0.024937046086828934

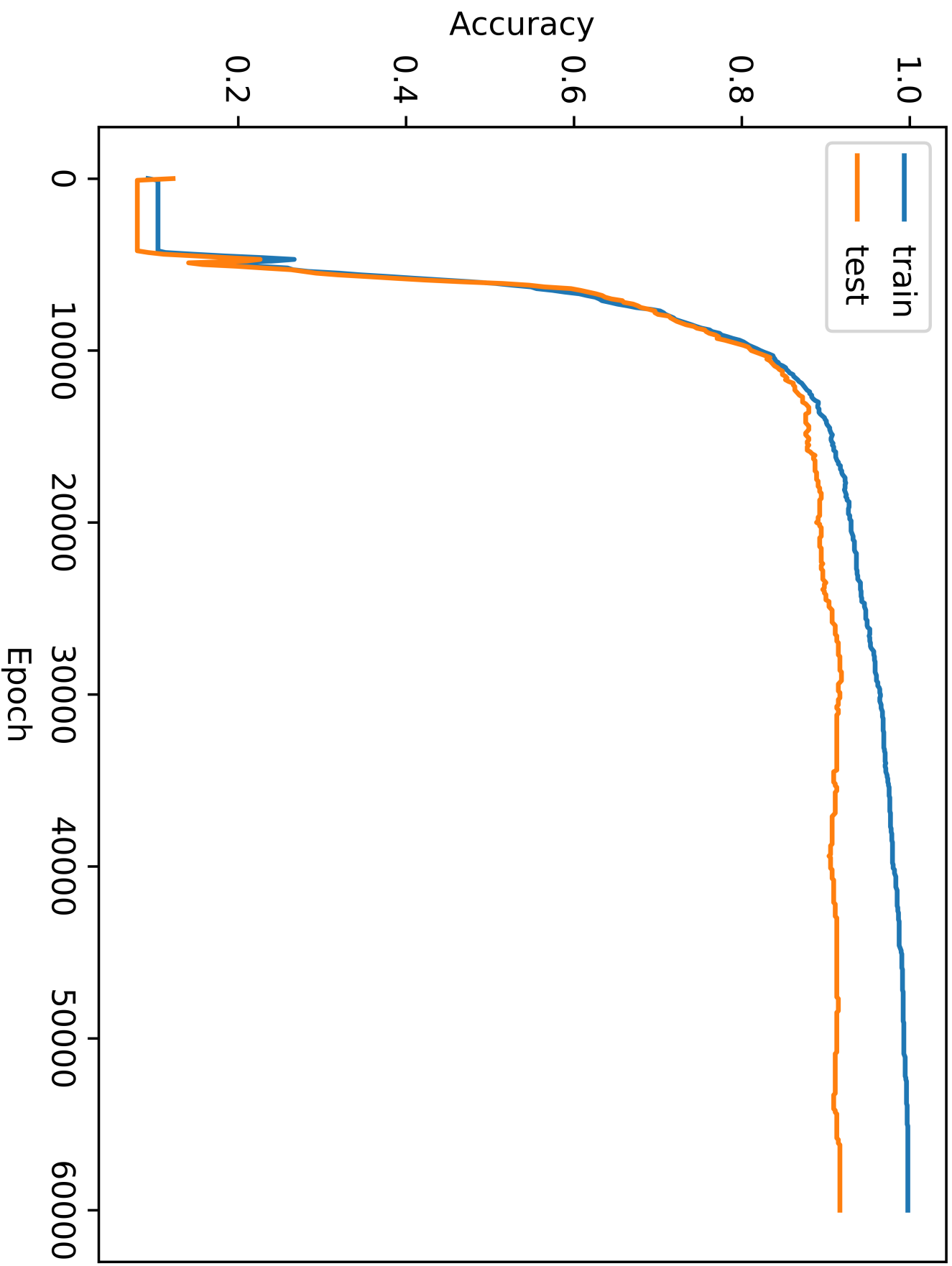
Loss on Test : 0.456962350384787

Accuracy on Train : 0.9976133651551312

Accuracy on Test : 0.9166666666666666

[neural.py]

Mnist Neural Accuracy per Epoch



Mnist Neural Loss per Epoch

