Task 2

2.

How does this pretrained network perform in comparison to a randomly initialized network in terms of convergence time, final accuracy and other possible training quality metrics? Do a thorough analysis.

Ans-

Number of epochs=5

|  |  |  |
| --- | --- | --- |
|  | Model with Pretrained Network | Randomly initialised network |
| Convergence time | 115 s | 20 s |
| Final accuracy | 1.0000 | 0.9964 |
| Validation loss | 0.0000e+00 | 0.0503 |
| Validation Accuracy | 1.0000 | 0.9832 |
| Average training time for individual epoch | 23 s | 4 s |
| Loss | 0.0000e+00 | 0.0126 |
|  |  |  |

The model with pretrained network gives accuracy of 1.0 in the first epoch itself while randomly initialised network gives accuracy of 0.8915.

The model with pretrained network takes 6 times more time than the preinitialised network because it has more layers.

3.

Ans-

Number of epochs=20

|  |  |  |
| --- | --- | --- |
|  | Model with Pretrained Network | Randomly initialised network |
| Convergence time | 3980 s | 2800 s |
| Final accuracy | 0.1263 | 0.1062 |
| Test loss | 19.548660278320312 | 2.302675247192383 |
| Test Accuracy | 0.14259999990463257 | 0.09799999743700027 |
| Average training time for individual epoch | 199 s | 140 s |
| Loss | 26.9694 | 2.3052 |
|  |  |  |

Since the dataset wasn’t labelled correctly that’s why the training accuracy is very less and is around 0.1 .

Since the model with pretrained network has more layers it takes more time to train in comparison to randomly initialised network.

Both the networks have very less accuracy on mnist test set.