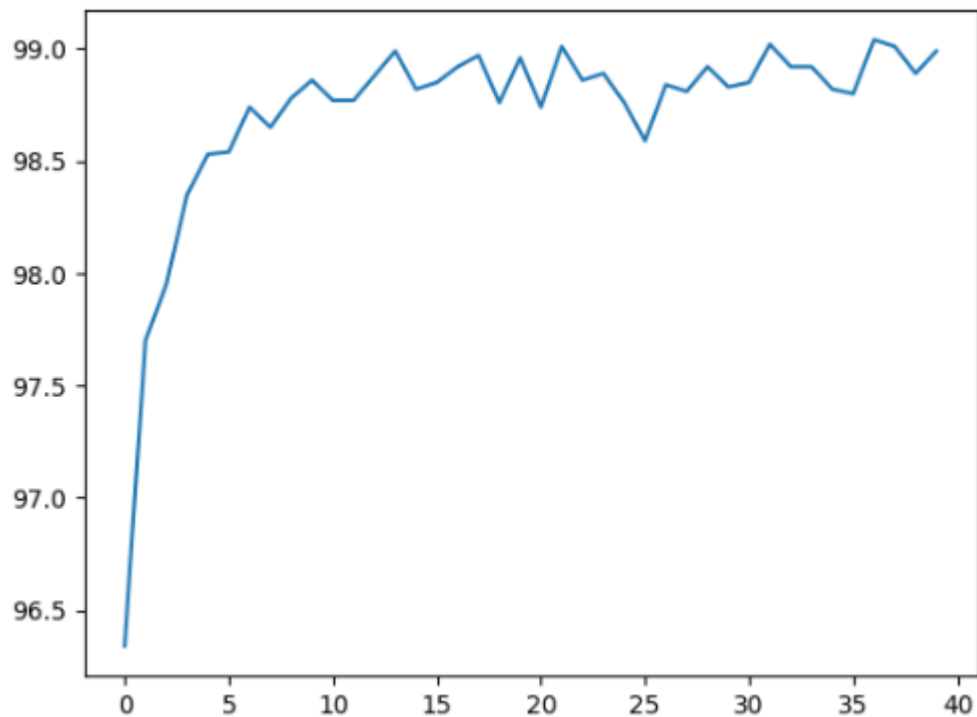


Rede CNN com DataSet MNIST

Integrantes: Matheus Maschio, Mateus Miri, Karine Haubert, Patrick Dutra, Abel Mariani, Benhur Machado, Eri Tiecher, Eduardo Rossatto.

Treinamento:

```
Saving Best Model with Accuracy: 96.33999633789062
Epoch: 1 Accuracy : 96.33999633789062 %
Saving Best Model with Accuracy: 97.69999694824219
Epoch: 2 Accuracy : 97.69999694824219 %
Saving Best Model with Accuracy: 97.94999694824219
Epoch: 3 Accuracy : 97.94999694824219 %
Saving Best Model with Accuracy: 98.3499984741211
Epoch: 4 Accuracy : 98.3499984741211 %
Saving Best Model with Accuracy: 98.52999877929688
Epoch: 5 Accuracy : 98.52999877929688 %
Saving Best Model with Accuracy: 98.54000091552734
Epoch: 6 Accuracy : 98.54000091552734 %
Saving Best Model with Accuracy: 98.73999786376953
Epoch: 7 Accuracy : 98.73999786376953 %
Epoch: 8 Accuracy : 98.6500015258789 %
Saving Best Model with Accuracy: 98.77999877929688
Epoch: 9 Accuracy : 98.77999877929688 %
Saving Best Model with Accuracy: 98.86000061035156
Epoch: 10 Accuracy : 98.86000061035156 %
Epoch: 11 Accuracy : 98.7699966430664 %
Epoch: 12 Accuracy : 98.7699966430664 %
Saving Best Model with Accuracy: 98.87999725341797
Epoch: 13 Accuracy : 98.87999725341797 %
Saving Best Model with Accuracy: 98.98999786376953
Epoch: 14 Accuracy : 98.98999786376953 %
Epoch: 15 Accuracy : 98.81999969482422 %
Epoch: 16 Accuracy : 98.8499984741211 %
Epoch: 17 Accuracy : 98.91999816894531 %
Epoch: 18 Accuracy : 98.97000122070312 %
Epoch: 19 Accuracy : 98.76000213623047 %
Epoch: 20 Accuracy : 98.95999908447266 %
Epoch: 21 Accuracy : 98.73999786376953 %
Saving Best Model with Accuracy: 99.01000213623047
Epoch: 22 Accuracy : 99.01000213623047 %
Epoch: 23 Accuracy : 98.86000061035156 %
Epoch: 24 Accuracy : 98.88999938964844 %
Epoch: 25 Accuracy : 98.76000213623047 %
Epoch: 26 Accuracy : 98.58999633789062 %
Epoch: 27 Accuracy : 98.83999633789062 %
Epoch: 28 Accuracy : 98.80999755859375 %
Epoch: 29 Accuracy : 98.91999816894531 %
Epoch: 30 Accuracy : 98.83000183105469 %
Epoch: 31 Accuracy : 98.8499984741211 %
Saving Best Model with Accuracy: 99.0199966430664
Epoch: 32 Accuracy : 99.0199966430664 %
Epoch: 33 Accuracy : 98.91999816894531 %
Epoch: 34 Accuracy : 98.91999816894531 %
Epoch: 35 Accuracy : 98.81999969482422 %
Epoch: 36 Accuracy : 98.80000305175781 %
Saving Best Model with Accuracy: 99.04000091552734
Epoch: 37 Accuracy : 99.04000091552734 %
Epoch: 38 Accuracy : 99.01000213623047 %
Epoch: 39 Accuracy : 98.88999938964844 %
Epoch: 40 Accuracy : 98.98999786376953 %
```



Validação:

```
•[104]: # Validando o Modelo
y_pred, y_true = predict_dl(lenet, val_dl)
pd.DataFrame(confusion_matrix(y_true, y_pred, labels=np.arange(0,10)))
```

[104]:

	0	1	2	3	4	5	6	7	8	9
0	974	1	2	0	0	0	0	1	2	0
1	0	1134	0	0	0	0	0	0	1	0
2	0	1	1028	0	1	0	0	1	1	0
3	0	1	4	999	0	2	0	1	3	0
4	0	0	1	0	973	0	3	0	0	5
5	2	1	0	6	0	878	1	0	3	1
6	1	3	0	0	3	1	950	0	0	0
7	1	2	5	0	1	0	0	1016	1	2
8	2	0	1	1	0	0	0	0	967	3
9	1	1	0	1	8	5	0	5	3	985

```
[108]: # Inferir com Imagem da Web
# path = "https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSq2h_xaDtemhitxk1AhEyzc5mYQu17d3Qb9Q&s"
# pred, x = inference_web_image(path, lenet, device=device)

# Inferir com Imagem Local
path = "../Train/1/Captura de tela 2024-06-16 211935.png"
pred, x = inference_local_image(path, lenet, device=device)

plt.imshow(x.squeeze(-1), cmap="gray")
pred_idx = np.argmax(pred)
print(f"Predicted: {pred_idx}, Prob: {pred[0][pred_idx]*100} %")
# print(pred)
```

Predicted: 1, Prob: 99.87574815750122 %

