NNDL: ICP6

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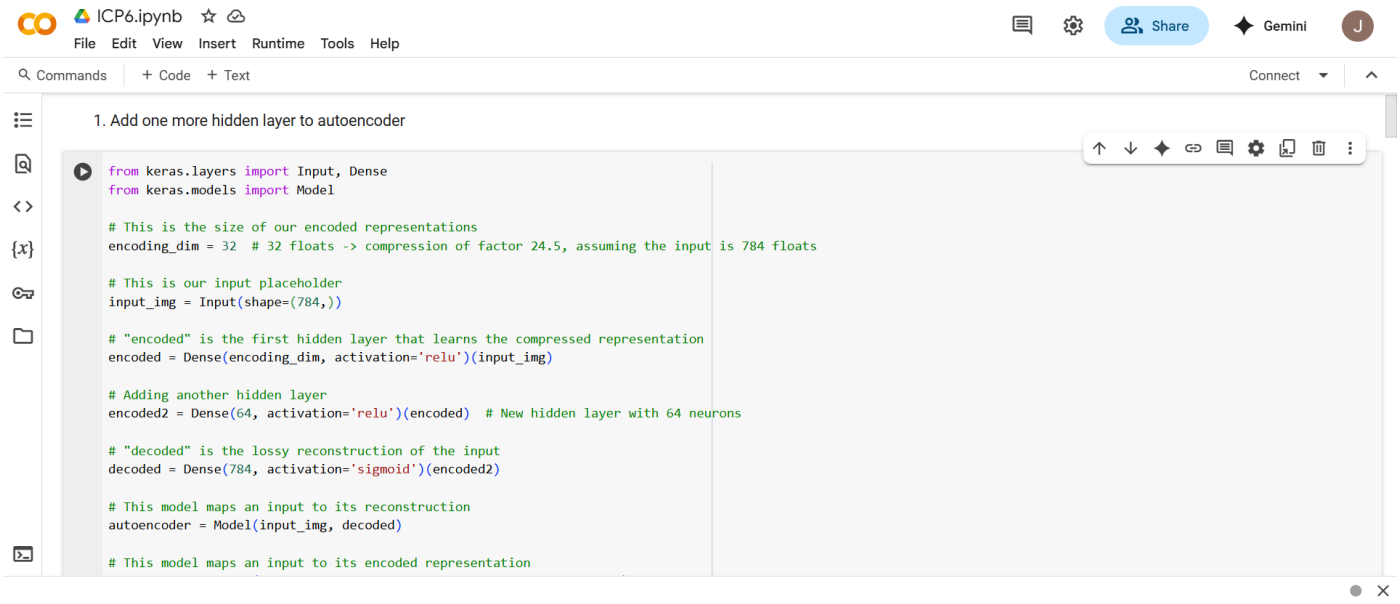
GITHUB LINK : https://github.com/jyothikiranboddeda/Neural-Network-Deep-Learning.git

VIDEO LINK :

https://drive.google.com/file/d/1NCZKv3f3vv-nUEZ1Kz7WkQJmrk9x1t51/view?usp=sharing

1. Add one more hidden layer to autoencoder



2. Do the prediction on the test data and then visualize one of the reconstructed version of that test data. Also, visualize the same test data before reconstruction using Matplotlib

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2. Do the prediction on the test data and then visualize one of the reconstructed version of that test data. Also, visualize the same test data before reconstruction using Matplotlib

```
[ ] import matplotlib.pyplot as plt
    import numpy as np

    # Predict the reconstruction of the test data
    reconstructed_imgs = autoencoder.predict(x_test)

    # Choose an index to visualize
    index = 10  # You can change this to any index you'd like

    # Plot the original test image
    plt.figure(figsize=(10, 5))

    # Plot the original image
    plt.subplot(1, 2, 1)
    plt.imshow(x_test[index].reshape(28, 28), cmap='gray')
    plt.title('Original Image')
    plt.axis('off')

    # Plot the reconstructed image
    plt.subplot(1, 2, 2)
    plt.imshow(reconstructed_imgs[index].reshape(28, 28), cmap='gray')
```

3. Repeat the question 2 on the denoisening autoencoder

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3.Repeat the question 2 on the denoisening autoencoder

```
[ ] import matplotlib.pyplot as plt
    import numpy as np

    # Assuming that the model (autoencoder) has already been trained with the noisy data

    # Step 2: Make predictions on the noisy test data
    reconstructed_imgs = autoencoder.predict(X_test_noisy)

    # Step 3: Choose an index to visualize
    index = 10  # You can choose any index from the test data

    # Plot the noisy test image, original (clean) image, and reconstructed image

    plt.figure(figsize=(15, 5))

    # Plot the noisy test image
    plt.subplot(1, 3, 1)
    plt.imshow(X_test_noisy[index].reshape(28, 28), cmap='gray')
    plt.title('Noisy Image')
    plt.axis('off')

    # Plot the original (clean) test image
    plt.subplot(1, 3, 2)
    plt.imshow(X_test[index].reshape(28, 28), cmap='gray')
    plt.title('Original Image')
    plt.axis('off')

    # Plot the denoised/reconstructed image
    plt.subplot(1, 3, 3)
    plt.imshow(reconstructed_imgs[index].reshape(28, 28), cmap='gray')
```

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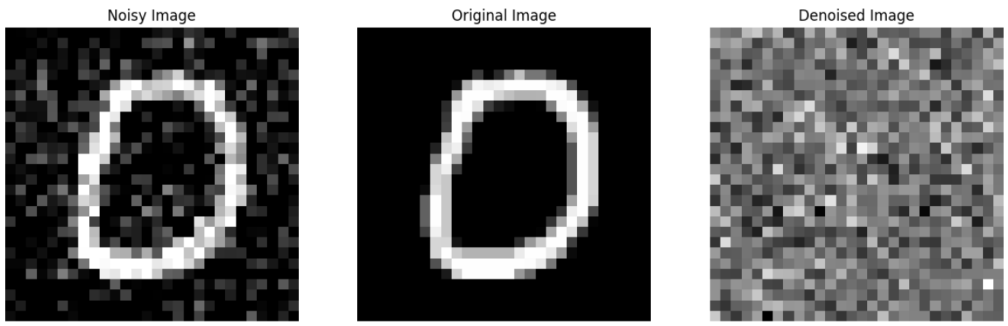
```
[ ] # Plot the denoised/reconstructed image
    plt.subplot(1, 3, 3)
    plt.imshow(reconstructed_imgs[index].reshape(28, 28), cmap='gray')
    plt.title('Denoised Image')
    plt.axis('off')

    # Show the plot
    plt.show()
```

```
313/313 ━━━━━━━━━━━━━━━━━━━━ 1s 2ms/step
```



4. plot loss and accuracy using the history object

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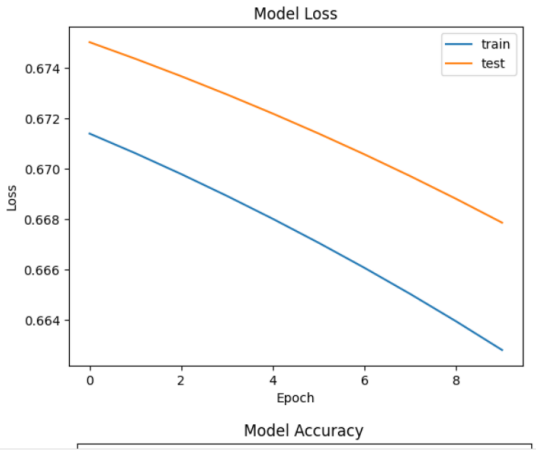
```
Epoch 9/10
235/235 ━━━━━━━━━━━━━━━━━━━━ 4s 15ms/step - accuracy: 6.1246e-04 - loss: 0.6642 - val_accuracy: 0.0000e+00 - val_loss: 0.6688
Epoch 10/10
235/235 ━━━━━━━━━━━━━━━━━━━━ 4s 12ms/step - accuracy: 7.4314e-04 - loss: 0.6631 - val_accuracy: 0.0000e+00 - val_loss: 0.6679
```



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