Neural Networks & Deep Learning Assignment-8

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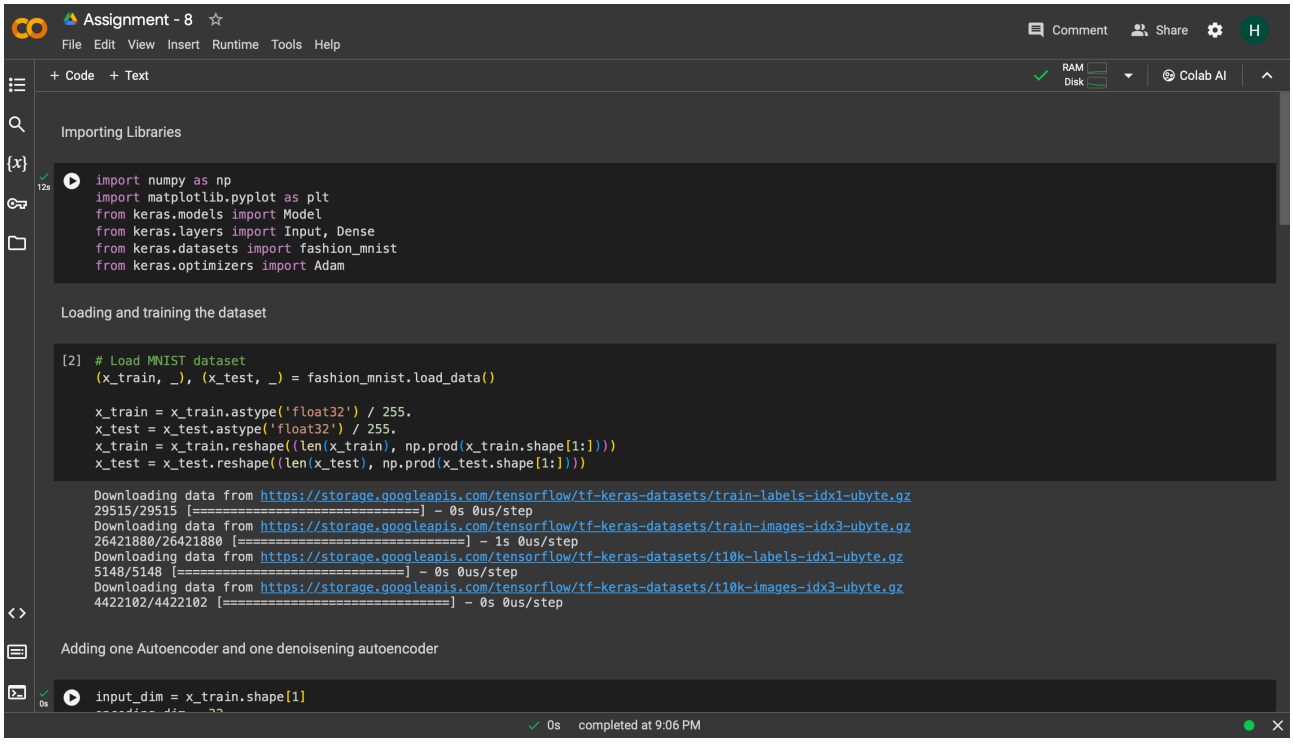
Repository Link :
https://github.com/harshavardhanreddy27/NNDL-ASSIGNMENT---8

Video Link:
https://drive.google.com/file/d/1Lm_6mjzpvT56QsPDcmqIRuxcvF8Wq1Bt/view?usp=share_link

Code Screenshots:



Assignment - 8

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Adding one Autoencoder and one denoisening autoencoder

```
input_dim = x_train.shape[1]
encoding_dim = 32

input_img = Input(shape=(input_dim,))
encoded = Dense(128, activation='relu')(input_img)
encoded = Dense(encoding_dim, activation='relu')(encoded)
decoded = Dense(128, activation='relu')(encoded)
decoded = Dense(input_dim, activation='sigmoid')(decoded)

autoencoder = Model(input_img, decoded)
```

```
[4] autoencoder.compile(optimizer='adam', loss='binary_crossentropy')
history = autoencoder.fit(x_train, x_train, epochs=10, batch_size=256, shuffle=True, validation_data=(x_test, x_test))
```

```
Epoch 1/10
235/235 [==============================] - 8s 21ms/step - loss: 0.3715 - val_loss: 0.3141
Epoch 2/10
235/235 [==============================] - 4s 16ms/step - loss: 0.3048 - val_loss: 0.3015
Epoch 3/10
235/235 [==============================] - 4s 18ms/step - loss: 0.2959 - val_loss: 0.2951
Epoch 4/10
235/235 [==============================] - 4s 19ms/step - loss: 0.2911 - val_loss: 0.2917
Epoch 5/10
235/235 [==============================] - 4s 16ms/step - loss: 0.2883 - val_loss: 0.2891
Epoch 6/10
235/235 [==============================] - 4s 18ms/step - loss: 0.2861 - val_loss: 0.2875
Epoch 7/10
235/235 [==============================] - 4s 19ms/step - loss: 0.2844 - val_loss: 0.2862
Epoch 8/10
235/235 [==============================] - 4s 16ms/step - loss: 0.2831 - val_loss: 0.2851
Epoch 9/10
235/235 [==============================] - 4s 18ms/step - loss: 0.2819 - val_loss: 0.2837
Epoch 10/10
235/235 [==============================] - 5s 19ms/step - loss: 0.2810 - val_loss: 0.2835
```

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Epoch 5/10
235/235 [==============================] - 4s 16ms/step - loss: 0.2883 - val_loss: 0.2891
Epoch 6/10
235/235 [==============================] - 4s 18ms/step - loss: 0.2861 - val_loss: 0.2875
Epoch 7/10
235/235 [==============================] - 4s 19ms/step - loss: 0.2844 - val_loss: 0.2862
Epoch 8/10
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Epoch 10/10
235/235 [==============================] - 5s 19ms/step - loss: 0.2810 - val_loss: 0.2835

Visualaizing Resconstruction of the data

```
decoded_imgs = autoencoder.predict(x_test)

n = 10
plt.figure(figsize=(20, 4))
for i in range(n):

    ax = plt.subplot(2, n, i + 1)
    plt.imshow(x_test[i].reshape(28, 28))
    plt.gray()
    ax.get_xaxis().set_visible(False)
    ax.get_yaxis().set_visible(False)


    ax = plt.subplot(2, n, i + 1 + n)
    plt.imshow(decoded_imgs[i].reshape(28, 28))
    plt.gray()
    ax.get_xaxis().set_visible(False)
    ax.get_yaxis().set_visible(False)
plt.show()
```

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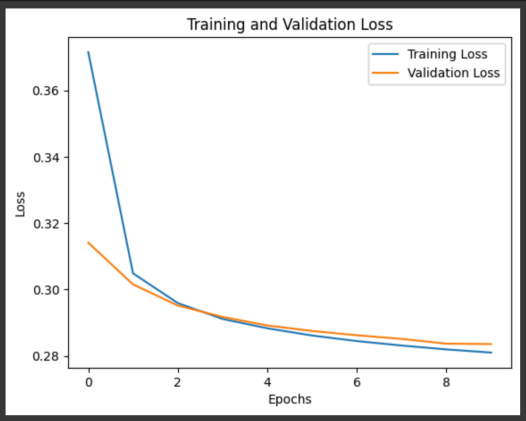
```
plt.plot(history.history['loss'], label='Training Loss')
plt.plot(history.history['val_loss'], label='Validation Loss')
plt.title('Training and Validation Loss')
plt.xlabel('Epochs')
plt.ylabel('Loss')
plt.legend()
plt.show()
```



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