```
import tensorflow.keras as keras
from tensorflow.keras.datasets import mnist
from tensorflow.keras.layers import Dense, Input, Flatten, Reshape,
LeakyReLU as LR, Activation, Dropout
from tensorflow.keras.models import Model, Sequential
from matplotlib import pyplot as plt
from IPython import display
import numpy as np

(x_train, y_train), (x_test, y_test) = mnist.load_data()
x_train = x_train / 255.0
x_test = x_test / 255.0

plt.imshow(x_train[0], cmap="gray")
plt.show()

LATENT_SIZE = 32

encoder = Sequential([
    Flatten(input_shape=(28, 28)),
    Dense(512),
    LR(),
    Dropout(0.5),
    Dense(256),
    LR(),
    Dropout(0.5),
    Dense(128),
    LR(),
    Dropout(0.5),
    Dense(64),
    LR(),
    Dropout(0.5),
    Dense(LATENT_SIZE),
    LR()
])

decoder = Sequential([
    Dense(64, input_shape=(LATENT_SIZE,)),
    LR(),
    Dropout(0.5),
    Dense(128),
    LR(),
    Dropout(0.5),
    Dense(256),
    LR(),
    Dropout(0.5),
    Dense(512),
    LR(),
    Dropout(0.5),
    Dense(784),
```

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    Activation("sigmoid"),
    Reshape((28, 28))
])

img = Input(shape=(28, 28))
latent_vector = encoder(img)
output = decoder(latent_vector)

model = Model(inputs=img, outputs=output)
model.compile("nadam", loss="binary_crossentropy")

model.summary()

EPOCHS = 60

for epoch in range(EPOCHS):
    fig, axs = plt.subplots(4, 4)
    rand = x_test[np.random.randint(0, 10000, 16)].reshape((4, 4, 1,
28, 28))

    display.clear_output()

    for i in range(4):
        for j in range(4):
            axs[i, j].imshow(model.predict(rand[i, j])[0],
cmap="gray")
            axs[i, j].axis("off")

    plt.subplots_adjust(wspace=0, hspace=0)
    plt.show()
    print("-----------", "EPOCH", epoch, "-----------")

    # Train on x_train as both input and target
    model.fit(x_train, x_train)
```

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1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 15ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 16ms/step
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```

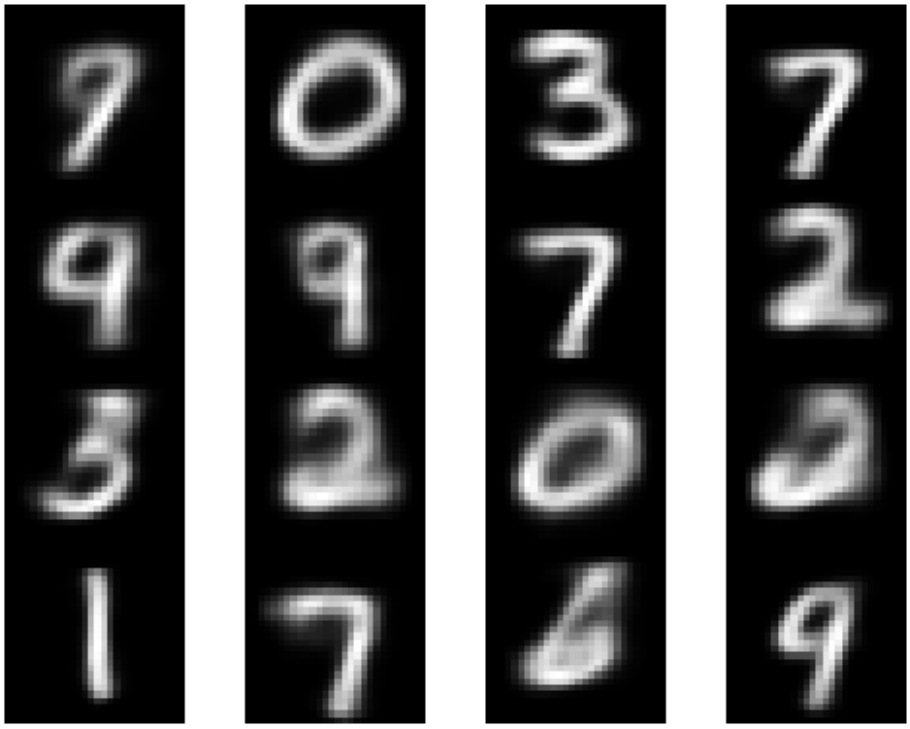

```
----------- EPOCH 59 -----------
1875/1875 ━━━━━━━━━━━━━━━━━━━━ 15s 8ms/step - loss: 0.1912
```