```
pip install tensorflow numpy matplotlib
```

```
Requirement already satisfied: tensorflow in
/usr/local/lib/python3.12/dist-packages (2.19.0)
Requirement already satisfied: numpy in
/usr/local/lib/python3.12/dist-packages (2.0.2)
Requirement already satisfied: matplotlib in
/usr/local/lib/python3.12/dist-packages (3.10.0)
Requirement already satisfied: absl-py>=1.0.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (1.4.0)
Requirement already satisfied: astunparse>=1.6.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (1.6.3)
Requirement already satisfied: flatbuffers>=24.3.25 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (25.12.19)
Requirement already satisfied: gast!=0.5.0,!=0.5.1,!=0.5.2,>=0.2.1
in /usr/local/lib/python3.12/dist-packages (from tensorflow) (0.7.0)
Requirement already satisfied: google-pasta>=0.1.1 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (0.2.0)
Requirement already satisfied: libclang>=13.0.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (18.1.1)
Requirement already satisfied: opt-einsum>=2.3.2 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (3.4.0)
Requirement already satisfied: packaging in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (25.0)
Requirement already satisfied: protobuf!=4.21.0,!=4.21.1,!=4.21.2,!
=4.21.3,!=4.21.4,!=4.21.5,<6.0.0dev,>=3.20.3 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (5.29.5)
Requirement already satisfied: requests<3,>=2.21.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (2.32.4)
Requirement already satisfied: setuptools in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (75.2.0)
Requirement already satisfied: six>=1.12.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (1.17.0)
Requirement already satisfied: termcolor>=1.1.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (3.3.0)
Requirement already satisfied: typing-extensions>=3.6.6 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (4.15.0)
Requirement already satisfied: wrapt>=1.11.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (2.0.1)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (1.76.0)
Requirement already satisfied: tensorboard~=2.19.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (2.19.0)
Requirement already satisfied: keras>=3.5.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (3.10.0)
Requirement already satisfied: h5py>=3.11.0 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (3.15.1)
Requirement already satisfied: ml-dtypes<1.0.0,>=0.5.1 in
/usr/local/lib/python3.12/dist-packages (from tensorflow) (0.5.4)
Requirement already satisfied: contourpy>=1.0.1 in
```

```
/usr/local/lib/python3.12/dist-packages (from matplotlib) (1.3.3)
Requirement already satisfied: cycler>=0.10 in
/usr/local/lib/python3.12/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in
/usr/local/lib/python3.12/dist-packages (from matplotlib) (4.61.1)
Requirement already satisfied: kiwisolver>=1.3.1 in
/usr/local/lib/python3.12/dist-packages (from matplotlib) (1.4.9)
Requirement already satisfied: pillow>=8 in
/usr/local/lib/python3.12/dist-packages (from matplotlib) (11.3.0)
Requirement already satisfied: pyparsing>=2.3.1 in
/usr/local/lib/python3.12/dist-packages (from matplotlib) (3.3.1)
Requirement already satisfied: python-dateutil>=2.7 in
/usr/local/lib/python3.12/dist-packages (from matplotlib)
(2.9.0.post0)
Requirement already satisfied: wheel<1.0,>=0.23.0 in
/usr/local/lib/python3.12/dist-packages (from astunparse>=1.6.0-
>tensorflow) (0.45.1)
Requirement already satisfied: rich in /usr/local/lib/python3.12/dist-
packages (from keras>=3.5.0->tensorflow) (13.9.4)
Requirement already satisfied: namex in
/usr/local/lib/python3.12/dist-packages (from keras>=3.5.0-
>tensorflow) (0.1.0)
Requirement already satisfied: optree in
/usr/local/lib/python3.12/dist-packages (from keras>=3.5.0-
>tensorflow) (0.18.0)
Requirement already satisfied: charset_normalizer<4,>=2 in
/usr/local/lib/python3.12/dist-packages (from requests<3,>=2.21.0-
>tensorflow) (3.4.4)
Requirement already satisfied: idna<4,>=2.5 in
/usr/local/lib/python3.12/dist-packages (from requests<3,>=2.21.0-
>tensorflow) (3.11)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.12/dist-packages (from requests<3,>=2.21.0-
>tensorflow) (2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.12/dist-packages (from requests<3,>=2.21.0-
>tensorflow) (2026.1.4)
Requirement already satisfied: markdown>=2.6.8 in
/usr/local/lib/python3.12/dist-packages (from tensorboard~=2.19.0-
>tensorflow) (3.10)
Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0
in /usr/local/lib/python3.12/dist-packages (from tensorboard~=2.19.0-
>tensorflow) (0.7.2)
Requirement already satisfied: werkzeug>=1.0.1 in
/usr/local/lib/python3.12/dist-packages (from tensorboard~=2.19.0-
>tensorflow) (3.1.5)
Requirement already satisfied: markupsafe>=2.1.1 in
/usr/local/lib/python3.12/dist-packages (from werkzeug>=1.0.1-
>tensorboard~=2.19.0->tensorflow) (3.0.3)
```

```
Requirement already satisfied: markdown-it-py>=2.2.0 in
/usr/local/lib/python3.12/dist-packages (from rich->keras>=3.5.0-
>tensorflow) (4.0.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in
/usr/local/lib/python3.12/dist-packages (from rich->keras>=3.5.0-
>tensorflow) (2.19.2)
Requirement already satisfied: mdurl~=0.1 in
/usr/local/lib/python3.12/dist-packages (from markdown-it-py>=2.2.0-
>rich->keras>=3.5.0->tensorflow) (0.1.2)

import os
import numpy as np
import tensorflow as tf
from tensorflow.keras import layers, models
import matplotlib.pyplot as plt

# ==========================================
# 1. CONFIGURATION & INPUT PARAMETERS [cite: 14, 15]
# ==========================================
print("--- GAN Configuration ---")
DATASET_CHOICE = 'mnist'  # Fixed as per user request
EPOCHS = int(input("Enter Epochs (rec. 30-100): ") or 50) # [cite: 17]
BATCH_SIZE = int(input("Enter Batch Size (rec. 64/128): ") or 128) #
[cite: 18]
NOISE_DIM = int(input("Enter Noise Dimension (rec. 100): ") or 100) #
[cite: 19]
LEARNING_RATE = 0.0002 # [cite: 20]
SAVE_INTERVAL = int(input("Enter Save Interval (rec. 5): ") or 5) #
[cite: 21]

# Create directories for outputs [cite: 40, 43]
os.makedirs('generated_samples', exist_ok=True)
os.makedirs('final_generated_images', exist_ok=True)

# ==========================================
# 2. LOAD & PREPROCESS DATA [cite: 9, 10, 13]
# ==========================================
print(f"\nLoading {DATASET_CHOICE} dataset...")
(train_images, train_labels), (_, _) =
tf.keras.datasets.mnist.load_data()

# Normalize to range [-1, 1]
train_images = train_images.reshape(train_images.shape[0], 28, 28,
1).astype('float32')
train_images = (train_images - 127.5) / 127.5

# Batch and shuffle the data
dataset =
tf.data.Dataset.from_tensor_slices(train_images).shuffle(60000).batch(
BATCH_SIZE)
```

```
# ==========================================
# 3. BUILD MODELS [cite: 23, 24, 25]
# ==========================================

def build_generator():
    """Designs the Generator network"""
    model = models.Sequential()
    # Foundation for 7x7 image
    model.add(layers.Dense(7*7*256, use_bias=False,
input_shape=(NOISE_DIM,)))
    model.add(layers.BatchNormalization())
    model.add(layers.LeakyReLU())

    model.add(layers.Reshape((7, 7, 256)))

    # Upsample to 14x14
    model.add(layers.Conv2DTranspose(128, (5, 5), strides=(1, 1),
padding='same', use_bias=False))
    model.add(layers.BatchNormalization())
    model.add(layers.LeakyReLU())

    # Upsample to 28x28
    model.add(layers.Conv2DTranspose(64, (5, 5), strides=(2, 2),
padding='same', use_bias=False))
    model.add(layers.BatchNormalization())
    model.add(layers.LeakyReLU())

    # Output layer (tanh activation for [-1, 1] range) [cite: 31]
    model.add(layers.Conv2DTranspose(1, (5, 5), strides=(2, 2),
padding='same', use_bias=False, activation='tanh'))
    return model

def build_discriminator():
    """Designs the Discriminator network"""
    model = models.Sequential()

    model.add(layers.Conv2D(64, (5, 5), strides=(2, 2),
padding='same', input_shape=[28, 28, 1]))
    model.add(layers.LeakyReLU())
    model.add(layers.Dropout(0.3))

    model.add(layers.Conv2D(128, (5, 5), strides=(2, 2),
padding='same'))
    model.add(layers.LeakyReLU())
    model.add(layers.Dropout(0.3))

    model.add(layers.Flatten())
    model.add(layers.Dense(1)) # Output logic (real/fake score)
    return model
```

```
generator = build_generator()
discriminator = build_discriminator()

# Loss and Optimizers [cite: 32]
cross_entropy = tf.keras.losses.BinaryCrossentropy(from_logits=True)
generator_optimizer = tf.keras.optimizers.Adam(LEARNING_RATE)
discriminator_optimizer = tf.keras.optimizers.Adam(LEARNING_RATE)

# ==========================================
# 4. TRAINING LOGIC
# ==========================================

def discriminator_loss(real_output, fake_output):
    real_loss = cross_entropy(tf.ones_like(real_output), real_output)
    fake_loss = cross_entropy(tf.zeros_like(fake_output), fake_output)
    return real_loss + fake_loss

def generator_loss(fake_output):
    return cross_entropy(tf.ones_like(fake_output), fake_output)

@tf.function
def train_step(images):
    noise = tf.random.normal([BATCH_SIZE, NOISE_DIM])

    with tf.GradientTape() as gen_tape, tf.GradientTape() as
disc_tape:
        generated_images = generator(noise, training=True)

        real_output = discriminator(images, training=True)
        fake_output = discriminator(generated_images, training=True)

        gen_loss = generator_loss(fake_output)
        disc_loss = discriminator_loss(real_output, fake_output)

    gradients_of_generator = gen_tape.gradient(gen_loss,
generator.trainable_variables)
    gradients_of_discriminator = disc_tape.gradient(disc_loss,
discriminator.trainable_variables)

    generator_optimizer.apply_gradients(zip(gradients_of_generator,
generator.trainable_variables))

discriminator_optimizer.apply_gradients(zip(gradients_of_discriminator
, discriminator.trainable_variables))

    # Calculate approximate accuracy for logging
    # Real images > 0 is True, Fake images < 0 is True (since logits)
    real_acc = tf.reduce_mean(tf.cast(real_output > 0, tf.float32))
    fake_acc = tf.reduce_mean(tf.cast(fake_output < 0, tf.float32))
    d_acc = (real_acc + fake_acc) * 0.5 * 100

    return gen_loss, disc_loss, d_acc

def save_plot(examples, epoch, n=5):
    """Saves a grid of generated images [cite: 33, 40, 41]"""
    # Scale from [-1,1] to [0,1] for plotting
    examples = (examples + 1) / 2.0

    plt.figure(figsize=(10, 10))
    for i in range(n * n):
        plt.subplot(n, n, i+1)
        plt.axis('off')
        plt.imshow(examples[i, :, :, 0], cmap='gray')

    filename = f'generated_samples/epoch_{epoch:02d}.png'
    plt.savefig(filename)
    plt.close()

# ==========================================
# 5. PRE-TRAINED CLASSIFIER (For Output 4)
# ==========================================
# Since we need to predict labels, we quickly train a standard
classifier on MNIST
# or load one if available. We will train a simple one here for
completeness.
print("\nPreparing classifier for evaluation...")
classifier = models.Sequential([
    layers.Conv2D(32, (3, 3), activation='relu', input_shape=(28, 28,
1)),
    layers.MaxPooling2D((2, 2)),
    layers.Flatten(),
    layers.Dense(64, activation='relu'),
    layers.Dense(10, activation='softmax')
])
classifier.compile(optimizer='adam',
loss='sparse_categorical_crossentropy', metrics=['accuracy'])
# Train on a small subset just to make it functional for the lab
demonstration
classifier.fit(train_images[:10000], train_labels[:10000], epochs=3,
verbose=0)
print("Classifier ready.")

# ==========================================
# 6. MAIN TRAINING LOOP [cite: 26, 36]
# ==========================================
print("\nStarting GAN Training...")
seed = tf.random.normal([25, NOISE_DIM]) # Seed for consistent
visualization
```

```
for epoch in range(1, EPOCHS + 1):
    gen_losses = []
    disc_losses = []
    disc_accs = []

    for image_batch in dataset:
        g_loss, d_loss, d_acc = train_step(image_batch)
        gen_losses.append(g_loss)
        disc_losses.append(d_loss)
        disc_accs.append(d_acc)

    # Calculate average stats for the epoch
    avg_g_loss = np.mean(gen_losses)
    avg_d_loss = np.mean(disc_losses)
    avg_d_acc = np.mean(disc_accs)

    # Output 1: Training Logs [cite: 37, 38]
    print(f"Epoch {epoch}/{EPOCHS} | D_loss: {avg_d_loss:.2f} | D_acc:
{avg_d_acc:.2f}% | G_loss: {avg_g_loss:.2f}")

    # Output 2: Save generated samples periodically [cite: 27, 41]
    if epoch % SAVE_INTERVAL == 0:
        fake_images = generator(seed, training=False)
        save_plot(fake_images.numpy(), epoch)
        print(f"  > Saved generated samples for epoch {epoch}")

import shutil # Import shutil to help organize folders

# ===========================================
# 7. FINAL GENERATION & SORTED SAVING
# ===========================================
print("\n--- Final Phase: Generating and Sorting ---")

# [cite_start]1. Generate the 100 synthetic images [cite: 43]
print("Generating 100 synthetic images...")
final_noise = tf.random.normal([100, NOISE_DIM])
final_images = generator(final_noise, training=False)

# [cite_start]2. Predict labels using the pre-trained LeNet-5
classifier [cite: 44]
print("Classifying generated images...")
predictions = classifier.predict(final_images, verbose=0)
predicted_labels = np.argmax(predictions, axis=1)

# 3. Save images into labeled folders
base_dir = 'final_generated_images'

# Optional: Clear the directory first to avoid mixing old results
if os.path.exists(base_dir):
    shutil.rmtree(base_dir)
```

```
os.makedirs(base_dir)

print(f"Saving images to '{base_dir}/' sorted by label...")

for i in range(100):
    # Get the image and its predicted label
    img_array = final_images[i].numpy()
    label = predicted_labels[i]

    # Create a folder for this specific label (e.g.,
"final_generated_images/7")
    label_folder = os.path.join(base_dir, str(label))
    os.makedirs(label_folder, exist_ok=True)

    # Process image for saving (Rescale from [-1, 1] to [0, 255])
    img_array = (img_array + 1) / 2.0 * 255.0
    img_array = img_array.astype(np.uint8)

    # Save the file with a unique name
    filename = f"img_{i+1}_pred_{label}.png"
    save_path = os.path.join(label_folder, filename)
    tf.keras.utils.save_img(save_path, img_array)

print("Images saved successfully.")

# 4. Report the final distribution
unique, counts = np.unique(predicted_labels, return_counts=True)
print("\n--- Distribution of Generated Images ---")
for label, count in zip(unique, counts):
    print(f"Digit {label}: {count} images saved")

print("\nLab Completed Successfully.")
```

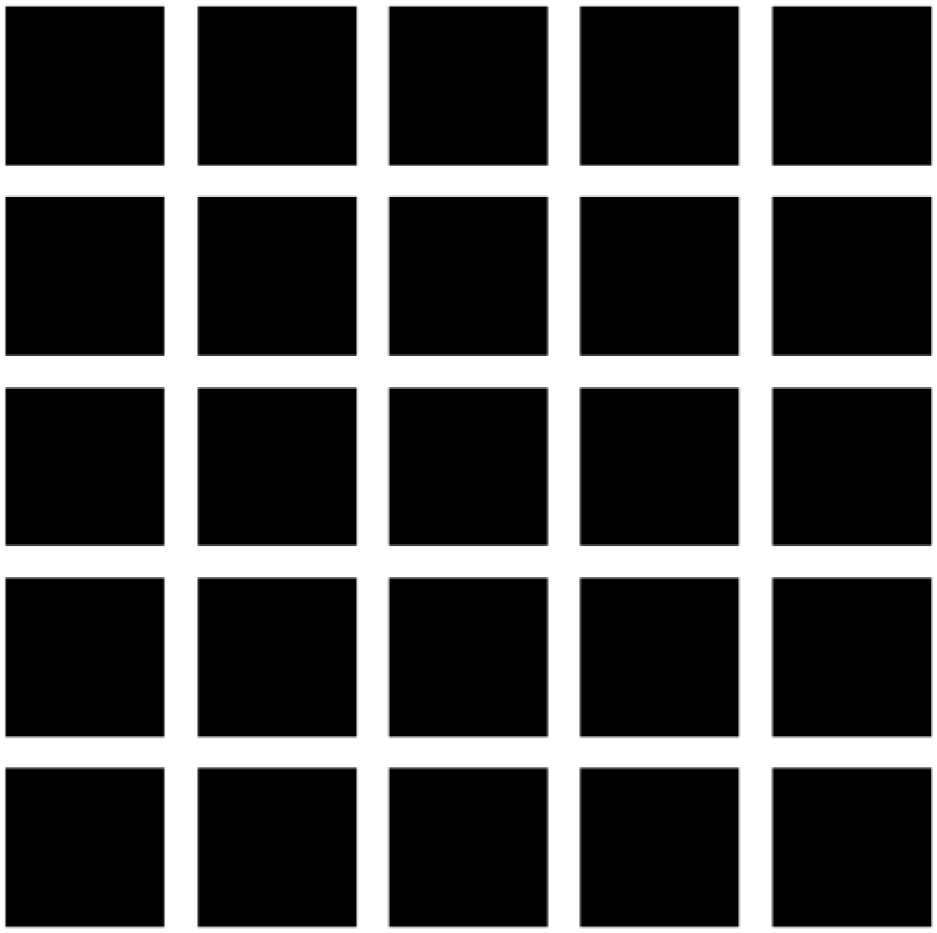
```
--- GAN Configuration ---
Enter Epochs (rec. 30-100): 30
Enter Batch Size (rec. 64/128): 64
Enter Noise Dimension (rec. 100): 100
Enter Save Interval (rec. 5): 10

Loading mnist dataset...

Preparing classifier for evaluation...
Classifier ready.

Starting GAN Training...
Epoch 1/30 | D_loss: 0.98 | D_acc: 77.14% | G_loss: 1.26
Epoch 2/30 | D_loss: 1.13 | D_acc: 71.69% | G_loss: 1.19
Epoch 3/30 | D_loss: 1.06 | D_acc: 74.12% | G_loss: 1.25
Epoch 4/30 | D_loss: 1.01 | D_acc: 75.64% | G_loss: 1.34
Epoch 5/30 | D_loss: 0.91 | D_acc: 78.81% | G_loss: 1.56
Epoch 6/30 | D_loss: 0.91 | D_acc: 78.84% | G_loss: 1.61
Epoch 7/30 | D_loss: 0.96 | D_acc: 76.88% | G_loss: 1.47
Epoch 8/30 | D_loss: 1.03 | D_acc: 74.50% | G_loss: 1.42
Epoch 9/30 | D_loss: 1.09 | D_acc: 72.21% | G_loss: 1.25
Epoch 10/30 | D_loss: 1.13 | D_acc: 70.74% | G_loss: 1.18
  > Saved generated samples for epoch 10
Epoch 11/30 | D_loss: 1.14 | D_acc: 70.40% | G_loss: 1.14
Epoch 12/30 | D_loss: 1.15 | D_acc: 70.35% | G_loss: 1.13
Epoch 13/30 | D_loss: 1.16 | D_acc: 69.72% | G_loss: 1.10
Epoch 14/30 | D_loss: 1.15 | D_acc: 69.99% | G_loss: 1.12
Epoch 15/30 | D_loss: 1.17 | D_acc: 68.95% | G_loss: 1.07
Epoch 16/30 | D_loss: 1.16 | D_acc: 69.54% | G_loss: 1.10
Epoch 17/30 | D_loss: 1.18 | D_acc: 68.66% | G_loss: 1.07
Epoch 18/30 | D_loss: 1.18 | D_acc: 68.75% | G_loss: 1.06
Epoch 19/30 | D_loss: 1.19 | D_acc: 68.14% | G_loss: 1.05
Epoch 20/30 | D_loss: 1.18 | D_acc: 68.67% | G_loss: 1.07
  > Saved generated samples for epoch 20
Epoch 21/30 | D_loss: 1.20 | D_acc: 67.71% | G_loss: 1.03
Epoch 22/30 | D_loss: 1.20 | D_acc: 67.86% | G_loss: 1.03
Epoch 23/30 | D_loss: 1.20 | D_acc: 67.91% | G_loss: 1.03
Epoch 24/30 | D_loss: 1.21 | D_acc: 67.37% | G_loss: 1.00
Epoch 25/30 | D_loss: 1.20 | D_acc: 67.89% | G_loss: 1.03
Epoch 26/30 | D_loss: 1.20 | D_acc: 67.63% | G_loss: 1.02
Epoch 27/30 | D_loss: 1.21 | D_acc: 67.07% | G_loss: 1.00
Epoch 28/30 | D_loss: 1.20 | D_acc: 67.95% | G_loss: 1.05
Epoch 29/30 | D_loss: 1.21 | D_acc: 67.24% | G_loss: 1.02
Epoch 30/30 | D_loss: 1.21 | D_acc: 67.10% | G_loss: 1.02
  > Saved generated samples for epoch 30

--- Final Phase: Generating and Sorting ---
Generating 100 synthetic images...
Classifying generated images...
Saving images to 'final_generated_images/' sorted by label...
Images saved successfully.

--- Distribution of Generated Images ---
Digit 0: 13 images saved
Digit 1: 11 images saved
Digit 2: 12 images saved
Digit 3: 7 images saved
Digit 4: 8 images saved
Digit 5: 11 images saved
Digit 6: 6 images saved
Digit 7: 10 images saved
Digit 8: 9 images saved
Digit 9: 13 images saved

Lab Completed Successfully.
```

```python
import os
import matplotlib.pyplot as plt
```

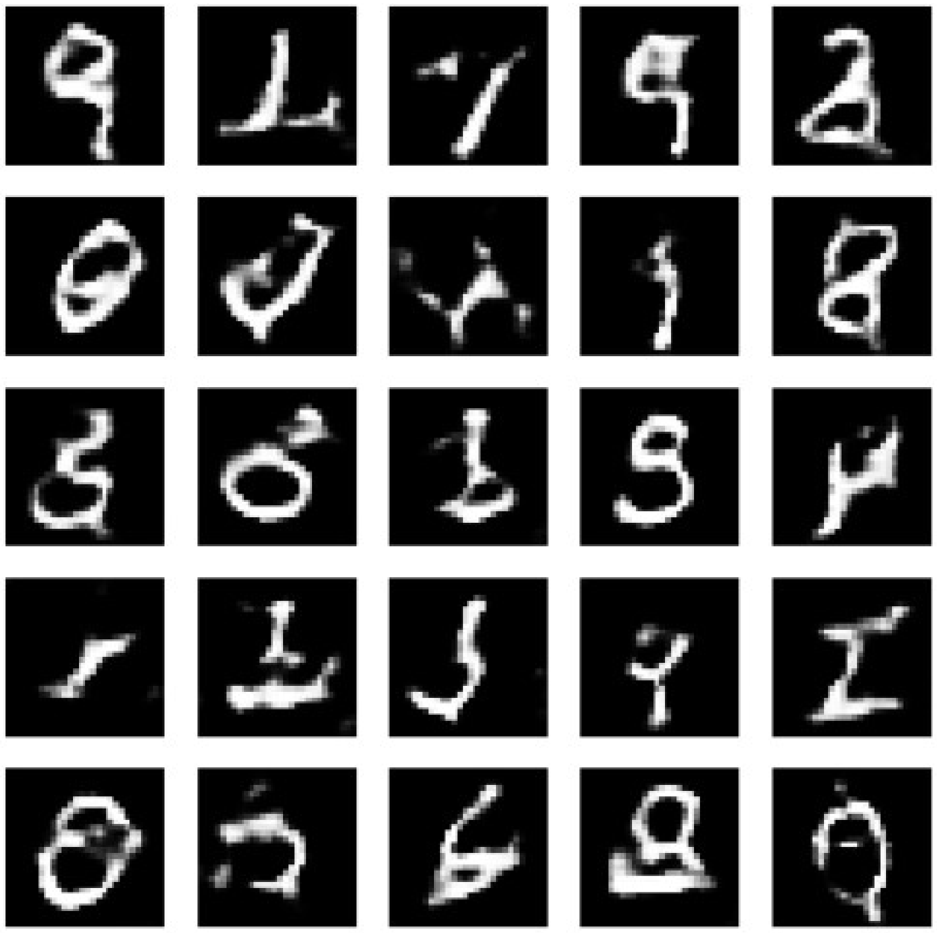
```python
# Get all generated sample image files
image_files = [f for f in os.listdir('generated_samples') if
f.startswith('epoch_') and f.endswith('.png')]

# Sort files by epoch number
image_files.sort(key=lambda x: int(x.split('_')[1].split('.')[0]))

print("Displaying generated images at each save interval:")

for img_file in image_files:
    epoch_num = int(img_file.split('_')[1].split('.')[0])
    img_path = os.path.join('generated_samples', img_file)

    plt.figure(figsize=(8, 8))
    plt.imshow(plt.imread(img_path))
    plt.axis('off')
    plt.title(f'Generated Images - Epoch {epoch_num}')
    plt.show()
```

```
Displaying generated images at each save interval:
```

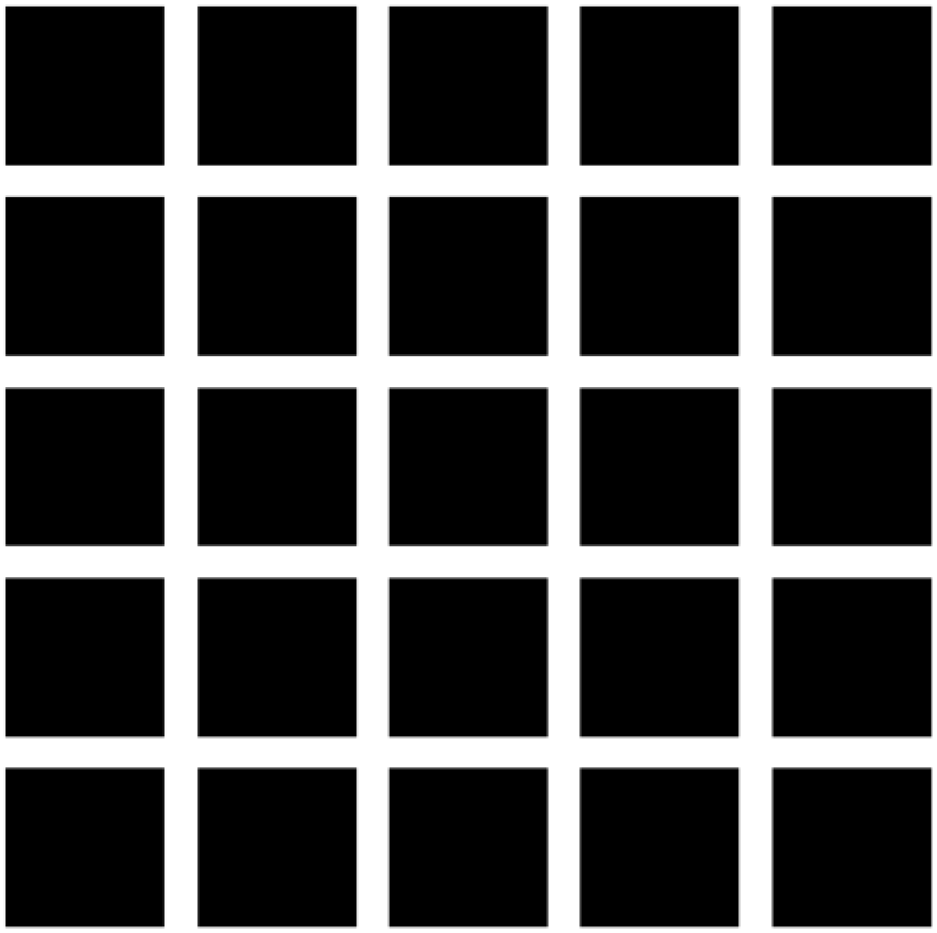
Generated Images - Epoch 5



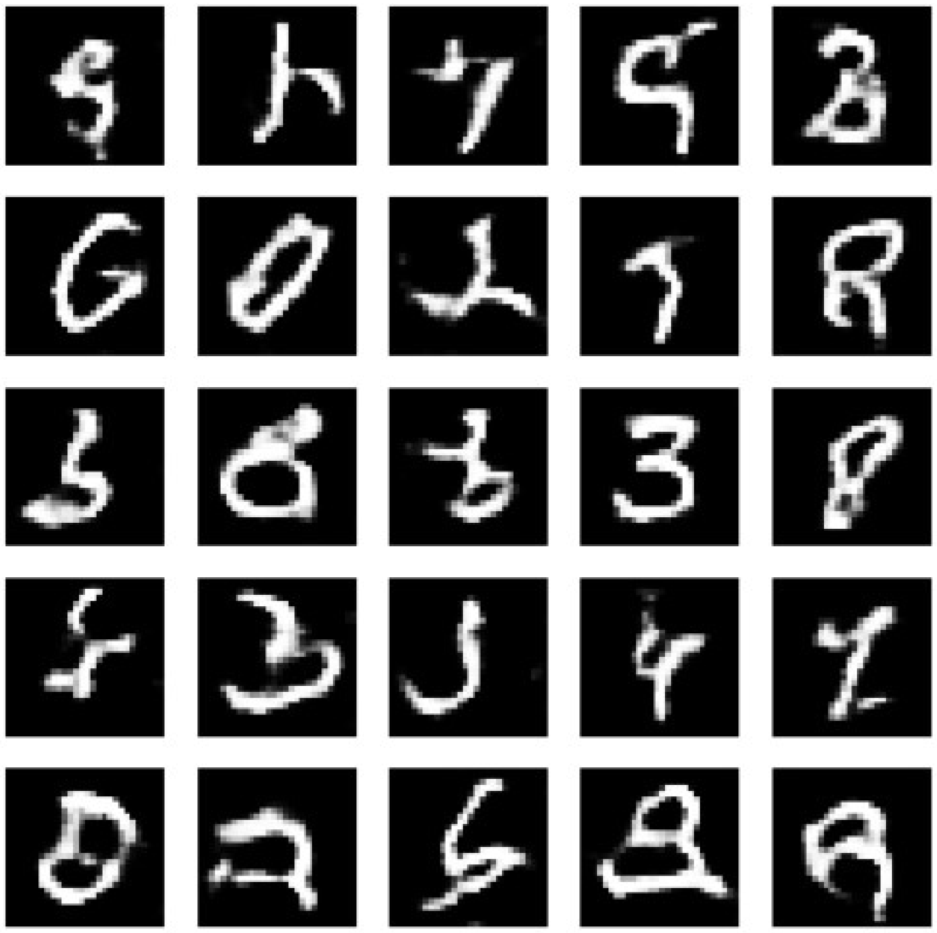
Generated Images - Epoch 10



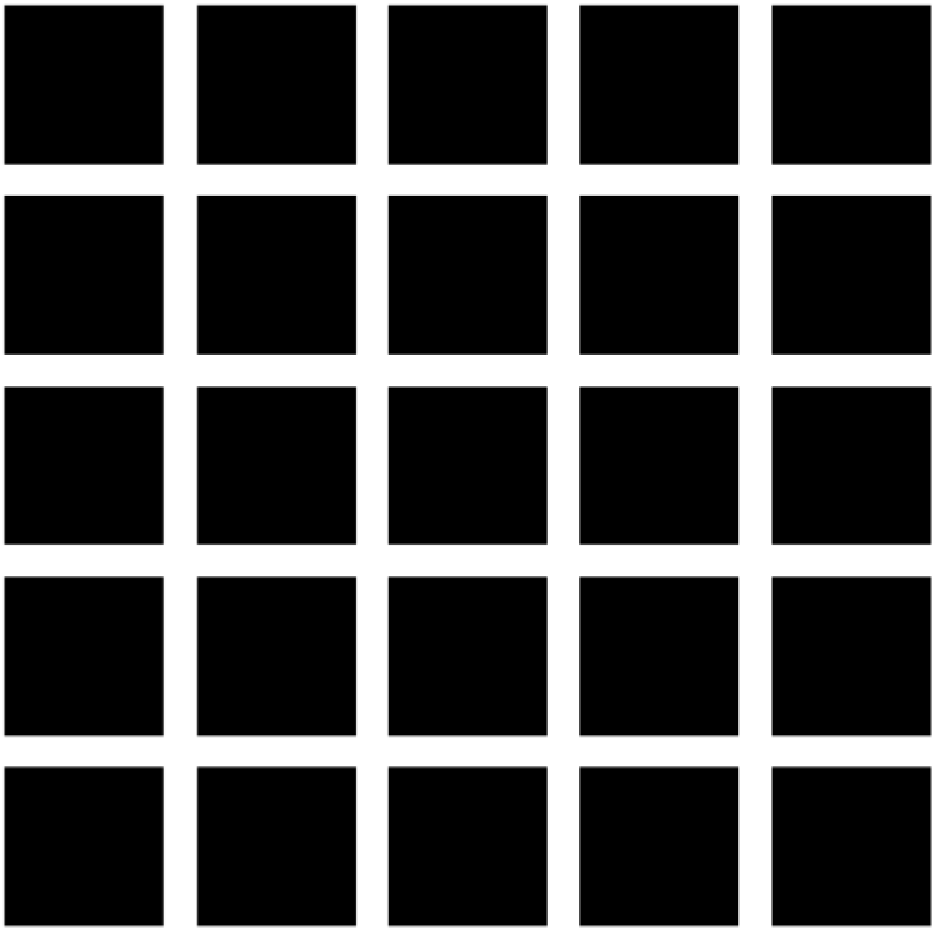
Generated Images - Epoch 15



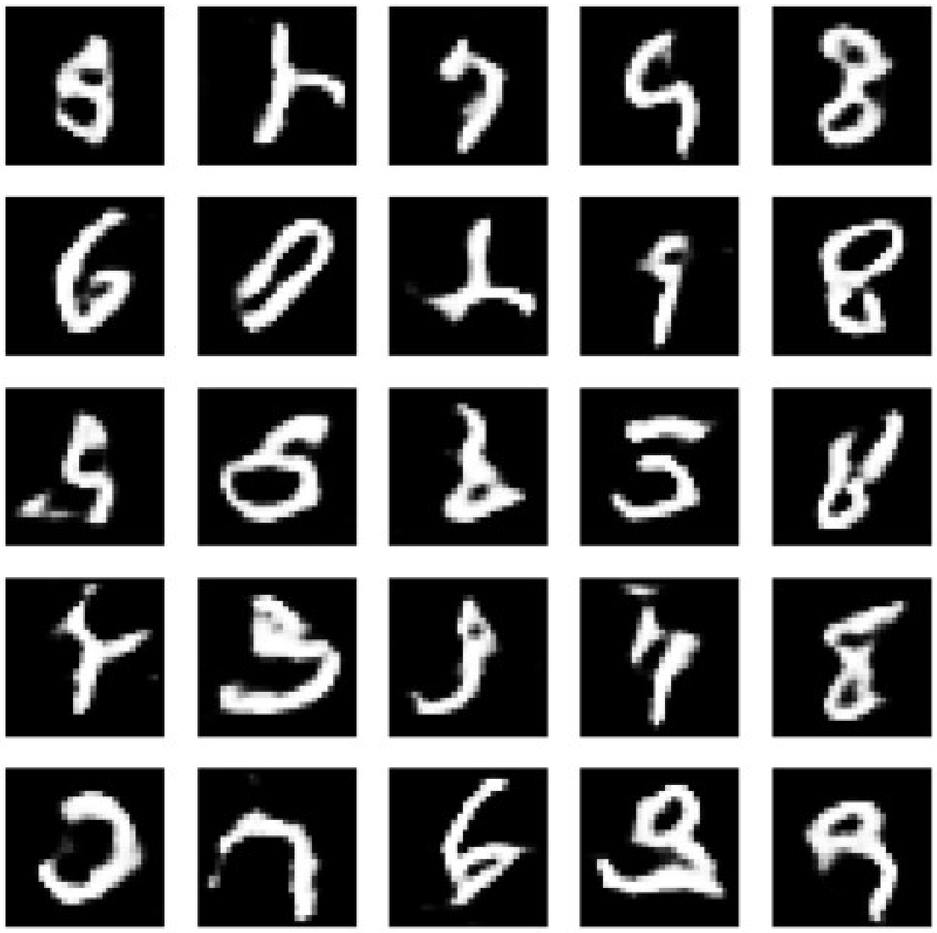
Generated Images - Epoch 20



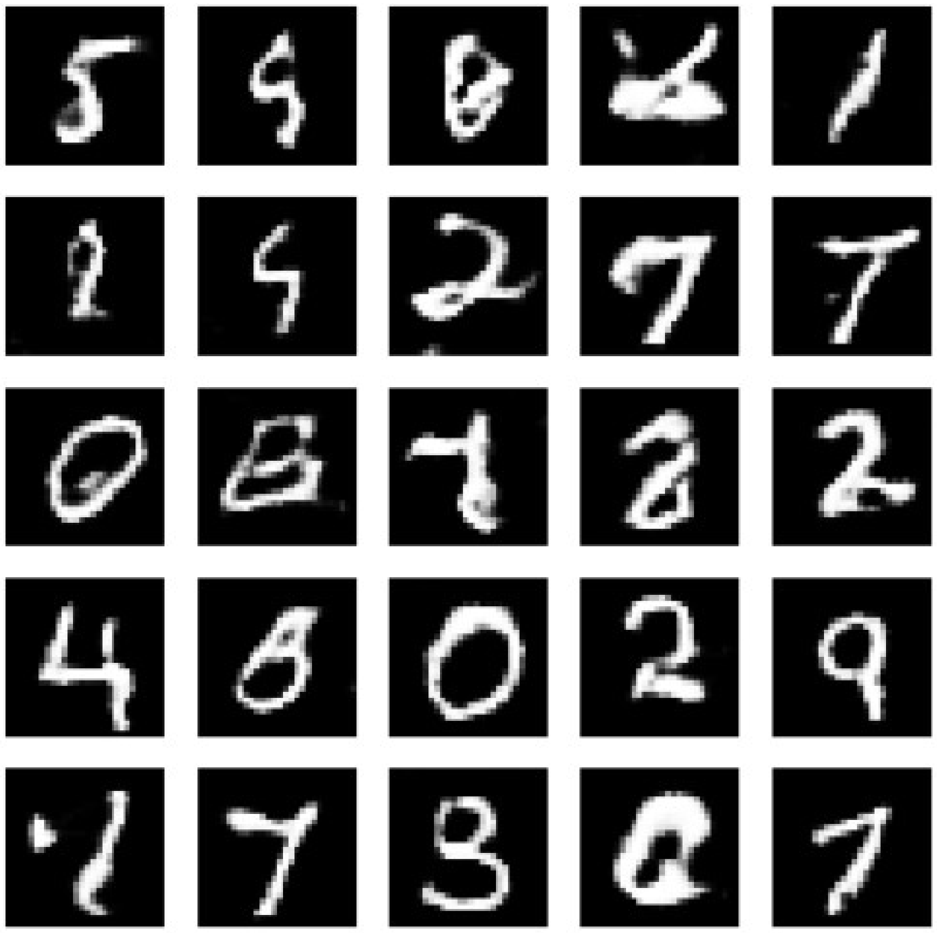
Generated Images - Epoch 25



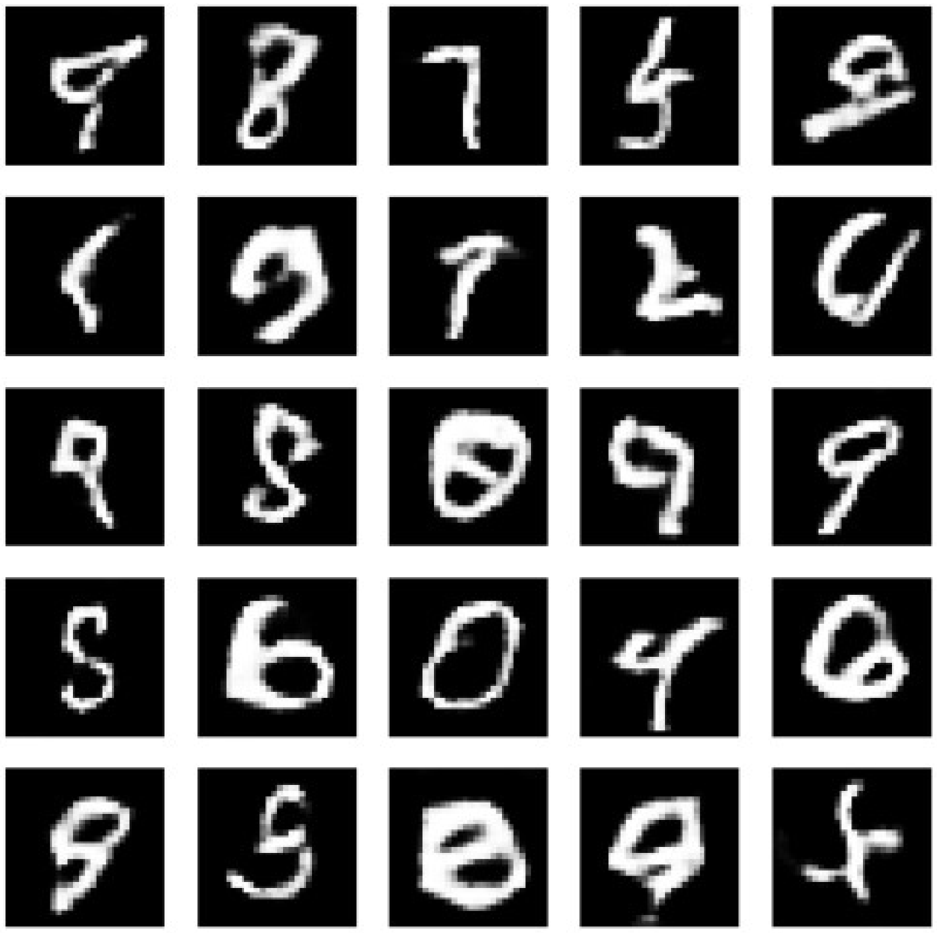
Generated Images - Epoch 30



Generated Images - Epoch 35



Generated Images - Epoch 40



Evaluate LeNet-5 Accuracy on Generated Images

Now that the generated images are sorted into labeled folders, we can evaluate the LeNet-5 classifier's accuracy using these folder names as the ground truth.

```
import os
import numpy as np
import tensorflow as tf
from tensorflow.keras.preprocessing import image
```

```python
from sklearn.metrics import accuracy_score

print("\n--- Evaluating LeNet-5 on Generated Images ---")

# Path to the directory containing labeled generated images
base_dir = 'final_generated_images'

# Lists to store loaded images and their true labels
loaded_images = []
true_labels = []

# Load images from labeled folders
for label_folder in os.listdir(base_dir):
    if os.path.isdir(os.path.join(base_dir, label_folder)):
        label = int(label_folder)
        folder_path = os.path.join(base_dir, label_folder)
        for img_name in os.listdir(folder_path):
            img_path = os.path.join(folder_path, img_name)
            # Load image and preprocess it for the classifier
            img = image.load_img(img_path, color_mode='grayscale',
target_size=(28, 28))
            img_array = image.img_to_array(img)
            img_array = img_array / 127.5 - 1 # Normalize to [-1, 1]
range as used for GAN training
            loaded_images.append(img_array)
            true_labels.append(label)

if not loaded_images:
    print("No generated images found in labeled folders. Please ensure
the previous step ran correctly.")
else:
    # Convert lists to numpy arrays
    loaded_images = np.array(loaded_images)
    true_labels = np.array(true_labels)

    print(f"Loaded {len(loaded_images)} generated images with ground
truth labels.")

    # Use the trained LeNet-5 classifier to predict labels
    predictions = classifier.predict(loaded_images, verbose=0)
    predicted_labels = np.argmax(predictions, axis=1)

    # Calculate accuracy
    accuracy = accuracy_score(true_labels, predicted_labels)

    print(f"\nLeNet-5 Classifier Accuracy on Generated Images:
{accuracy:.4f}")

    print("\n--- Detailed Predictions (Every 5th Image) ---")
    for i in range(0, len(loaded_images), 5):
        true_l = true_labels[i]
        predicted_l = predicted_labels[i]
        is_correct = "Correct" if true_l == predicted_l else 
"Incorrect"
        print(f"Image {i+1}: True Label: {true_l}, Predicted Label: 
{predicted_l}, Result: {is_correct}")
```

```
--- Evaluating LeNet-5 on Generated Images ---
Loaded 100 generated images with ground truth labels.

LeNet-5 Classifier Accuracy on Generated Images: 0.9900

--- Detailed Predictions (Every 5th Image) ---
Image 1: True Label: 2, Predicted Label: 2, Result: Correct
Image 6: True Label: 2, Predicted Label: 2, Result: Correct
Image 11: True Label: 2, Predicted Label: 2, Result: Correct
Image 16: True Label: 9, Predicted Label: 9, Result: Correct
Image 21: True Label: 9, Predicted Label: 9, Result: Correct
Image 26: True Label: 7, Predicted Label: 7, Result: Correct
Image 31: True Label: 7, Predicted Label: 7, Result: Correct
Image 36: True Label: 1, Predicted Label: 1, Result: Correct
Image 41: True Label: 1, Predicted Label: 1, Result: Correct
Image 46: True Label: 1, Predicted Label: 1, Result: Correct
Image 51: True Label: 5, Predicted Label: 5, Result: Correct
Image 56: True Label: 5, Predicted Label: 5, Result: Correct
Image 61: True Label: 4, Predicted Label: 4, Result: Correct
Image 66: True Label: 3, Predicted Label: 3, Result: Correct
Image 71: True Label: 3, Predicted Label: 3, Result: Correct
Image 76: True Label: 0, Predicted Label: 0, Result: Correct
Image 81: True Label: 0, Predicted Label: 0, Result: Correct
Image 86: True Label: 8, Predicted Label: 8, Result: Correct
Image 91: True Label: 8, Predicted Label: 8, Result: Correct
Image 96: True Label: 6, Predicted Label: 6, Result: Correct
```