To implement an ensemble model for MNIST digit classification

Step 1: Choose Base Models
Select a set of diverse models to form the ensemble- Convolutional Neural Network (CNN), Random Forest, Support Vector Machine (SVM)

Step 2: Build Individual Models
Preprocess the MNIST data (normalize pixel values, reshape images, etc.).
Train each model separately and evaluate its performance.

Step 3: Implement Ensemble Techniques
Voting Classifier: Combine predictions from CNN, Random Forest, and SVM using hard or soft voting. Stacking: UseLogistic Regression to combine predictions from base models.

Step 4: Hyperparameter Tuning
Use techniques like Grid Search or Random Search to find the best hyperparameters for each model.

Step 5: Evaluate Ensemble Performance
Compare the ensemble's accuracy, precision, recall, and F1-score with individual models.

Implementation Steps
Preprocess Data:
Normalize pixel values to [0, 1].
Reshape images for CNN and flatten for other models.
Train Base Models: Train CNN, Random Forest, and SVM separately.
Combine Predictions: Use a Voting Classifier or Stacking to combine predictions.
Evaluate Ensemble: Compare accuracy, precision, recall, and F1-score of the ensemble with individual models.