# Steps to Run the Project

## 1. Ensure the dataset is available

Place `IRIS.csv` in the same directory as the script.

This dataset contains measurements of different iris flower species.

## 2. Install necessary dependencies

Run the following command to install required libraries:

```bash  
pip install pandas numpy seaborn matplotlib scikit-learn joblib  
```

## 3. Run the script

Execute the Python script using the command:

```bash  
python iris\_classification.py  
```

## 4. What the script does

- Loads and preprocesses the dataset (handling missing values and normalizing data).

- Splits data into training and testing sets.

- Trains a RandomForest classifier.

- Evaluates model performance using accuracy score, confusion matrix, and feature importance analysis.

- Saves the trained model for future use.

## 5. Making Predictions

Once the model is saved, you can load it and predict species for new data.

Example usage in Python:

```python  
loaded\_model, loaded\_scaler = load\_model()  
sample = [5.1, 3.5, 1.4, 0.2]  
print("Predicted species:", predict\_species(loaded\_model, loaded\_scaler, sample))  
```

## 6. Visualizing Results

- The script generates plots to visualize dataset distribution and model performance.

- Check the output directory for graphs and metrics.

## 7. Error Handling & Debugging

- If any dependency is missing, install it using pip.

- Ensure that `IRIS.csv` is in the correct location.

- If the script crashes, check the printed error message for debugging.