**Iris Species Classification using Random Forest**

This project is a simple web app built with **Streamlit** to classify Iris flower species using a **Random Forest Classifier** from scikit-learn. The model predicts the species based on user input for sepal and petal measurements.

**Project Overview**

The app uses the well-known **Iris dataset**, which contains data for three Iris flower species: Setosa, Versicolor, and Virginica. It includes features like sepal length, sepal width, petal length, and petal width. A **Random Forest** model is trained to classify the species based on these four features.

**Key Features**

* **Interactive User Input**: Users can adjust sliders for sepal and petal dimensions in the sidebar.
* **Instant Prediction**: The model predicts the Iris species based on the input, and the result is displayed instantly in the app.

**Code Explanation**

* **Data Loading**: The load\_iris() function from scikit-learn loads the dataset. The data is stored in a Pandas DataFrame, and a column for the species is added.

df = pd.DataFrame(iris.data, columns=iris.feature\_names)

df['species'] = iris.target

* **Caching Data**: The @st.cache\_data decorator is used to cache the dataset so that it doesn’t reload every time the app runs, speeding up performance.
* **Model Training**: A **Random Forest Classifier** is trained on the features (sepal and petal dimensions) to predict the species.

model.fit(X, y)

* **User Input**: The user inputs the sepal and petal measurements via Streamlit’s sliders.

sepal\_length = st.sidebar.slider("Sepal length", ...)

* **Prediction**: Based on the input values, the model makes a prediction, which is then displayed on the app.

prediction = model.predict(input\_data)

**Tech Stack**

* **Python**
* **Streamlit** (for the web interface)
* **Pandas** (for data manipulation)
* **Scikit-learn** (for machine learning)

**How to Run**

1. Install dependencies:

pip install streamlit pandas scikit-learn

1. Run the app:

streamlit run app.py

This will launch the app in your browser, allowing you to input sepal and petal measurements to classify the Iris species.