🌸 Iris Flower Classification Using Machine Learning

1. Introduction

The Iris Flower Classification project is a machine learning task to classify iris flowers into three species—Setosa, Versicolor, and Virginica—based on petal and sepal measurements. It is a classic beginner-friendly dataset in machine learning.

2. Abstract

This project uses a Logistic Regression model trained on the built-in Iris dataset from Scikit-learn. The dataset is visualized using Seaborn to understand the feature distribution. The final model is wrapped in a Streamlit web application for real-time predictions.

3. Tools and Technologies Used

- Python
- Jupyter Notebook
- Scikit-learn
- Pandas
- Seaborn
- Matplotlib
- Streamlit
- Joblib

4. Methodology

1. Loaded the Iris dataset using Scikit-learn
2. Converted it into a Pandas DataFrame and mapped target labels
3. Visualized feature relationships using pairplots and heatmaps
4. Trained a Logistic Regression model
5. Evaluated it using accuracy and confusion matrix
6. Saved the trained model using Joblib
7. Built a Streamlit app for prediction based on input features

5. Results

The Logistic Regression model achieved high accuracy on the test set. The Streamlit web app takes sepal and petal dimensions as input and predicts the corresponding flower species instantly.

6. Conclusion

This project demonstrates the full machine learning pipeline from data loading, exploration, training, evaluation to deployment. It provided hands-on experience with data preprocessing, model building, and user interface creation.

7. Future Enhancements

- Compare models like KNN and SVM
- Add visual feedback in the web app
- Deploy the app online using Streamlit Cloud or Hugging Face Spaces
- Collect real-world iris data from sensors or mobile input

8. Student Info

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