AI Internship Project Report

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GitHub Repository: Nimisha-Kambham

Internship Domain: Artificial Intelligence

Project Duration: 2 Months

Technologies Used: Python, Scikit-learn, Matplotlib, Google Colab

# Objective

The objective of this project is to implement and compare four machine learning classification algorithms—Decision Tree (Gini & Entropy), Support Vector Machine (SVM), K-Nearest Neighbors (KNN), and Random Forest—using the Iris dataset. The goal is to evaluate model performance using accuracy and classification metrics.

# Dataset Used

Name: Iris Dataset

Source: Scikit-learn built-in dataset

Features: Sepal Length, Sepal Width, Petal Length, Petal Width

Target Classes: Setosa, Versicolor, Virginica

# Project Workflow

1. Data Preprocessing:  
 - Loaded the dataset using load\_iris() from Scikit-learn.  
 - Splitting into training and testing datasets using train\_test\_split() with 80-20 split.

1. 2. Model Implementations:

## Decision Tree Classifier (Gini)

Criterion: Gini Index  
Accuracy: 1.0  
Visualization: Tree plotted using plot\_tree()

## Decision Tree Classifier (Entropy)

Criterion: Entropy (Information Gain)  
Accuracy: 1.0  
Visualization: Tree plotted using plot\_tree()

## Support Vector Machine (SVM)

Kernel: Default (RBF)  
Accuracy: 1.0  
Prediction: Predicted class for a sample input

## K-Nearest Neighbors (KNN)

K: 3  
Accuracy: 1.0  
Prediction: Predicted class for a sample input

## Random Forest Classifier

Estimators: 100  
Accuracy: 1.0  
Prediction: Predicted class for a sample input

# Evaluation Metrics

All models achieved 100% accuracy on the test dataset.  
Classification Report includes precision, recall, and f1-score for each class.

# Insights & Observations

The Iris dataset is small and clean, hence even basic models perform exceptionally well.  
All four classifiers showed perfect performance, indicating the dataset’s simplicity.  
Tree-based models provided good interpretability via visualizations.

# GitHub Repository

All source code files, including .py.txt files for each model, are available at:  
👉 https://github.com/Nimisha-Kambham

# Conclusion

This internship project successfully demonstrated core concepts of classification algorithms using Python. It strengthened practical knowledge in AI and machine learning workflows. The insights gained will be instrumental for future real-time data analytics and AI model building.