Practical No. 7

Aim :- To implement the random forest classifier using python & evaluate its performance on the iris dataset

Input : 1) Iris dataset with following features:
- i) sepal length
- ii) sepal width
- iii) petal length
- iv) petal width

2) Target : flower species

Output : Accuracy : 1.0

Classification Report :

	precision	Recall	f1-score	Support
setosa	1.00	1.00	1.00	16
versicolor	1.00	1.00	1.00	14
virginica	1.00	1.00	1.00	15

Theory :

What is Random forest ?

Random forest is an ensamble learning algorithm used for both classification & regression tasks. It works by building multiple decision trees & combining their outputs to make the final prediction.

In classification. it uses majority voting. In regre
it uses the average of pred from all the trees

why Random forest?
Decision trees are easy to use but can ave on
data. Random forest, solves this
1) Creating many decision trees on random its of
data.
2) Using random feature selection when spiled
3) combining predictions to reduce variance or imp
accuracy

How it works:
1. Bootstrap sampling: from the original data multi
random samples are drawn. thes are called boo
samples.
2. Tree creation: for each bootstrap sample decisi
tree is built. However, only a random subset of fe
is used to split nodes
3. Ensemble voting:
1) for classification, each tree values for a class
The most voted class is selected.
2) for regression, the average prediction from d
is taken

Algorithm steps :

[step 1] : start
[step 2] : Load the dataset
[step 3] : preprocess the data if needed.
[step 4] : Split the data into training & testing sets.
[step 5] : Initialize the randomforest classifier with desired parameter
[step 6] : Train the model using training set.
[step 7] : predict the output of the test set.
[step 8] : Evaluate the model's performance using accuracy & classification.
[step 9] : end.

Conclusion :

Random forest is a powerful, flexible, & highly accurate ensemble algorithm. In this practical we sucessfully implemented Random forest classifier using the iris dataset. The model achieved excellent accuracy, making it suitable for various real-world classification problems. Its ability to handle noise & complex data.
it a top choice in many machine learning task.

Date :

Flowchart :