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Practical no 5

AIM: Implement decision tree learning algorithm for the restaurant waiting problem.

STEPS:

Step1: Download the graph viz file from below link and extract it

https://graphviz.gitlab.io/_pages/Download/windows/graphviz-2.38.zip

Step2: Install the sklearn , ipython and pydotplus packages.First copy the path of script in python folder and then change the path of cmd.

Step3: Now install the packages by writing pip install and the packages name.

Step4: Next you have to change the environment variable. Copy the path of graphiz. Then go to environment and add new path.

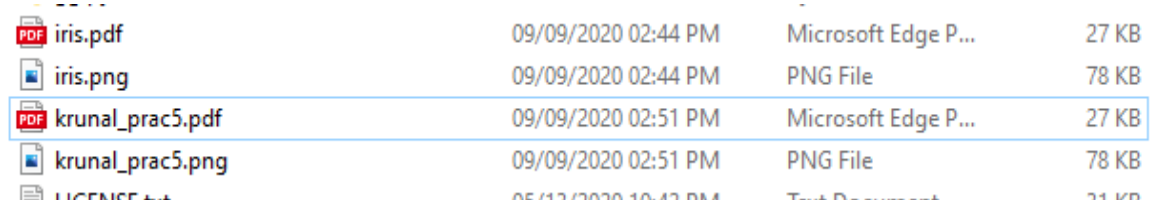
Step5: After all this is done write the code and run it . output will be in pdf and png format.

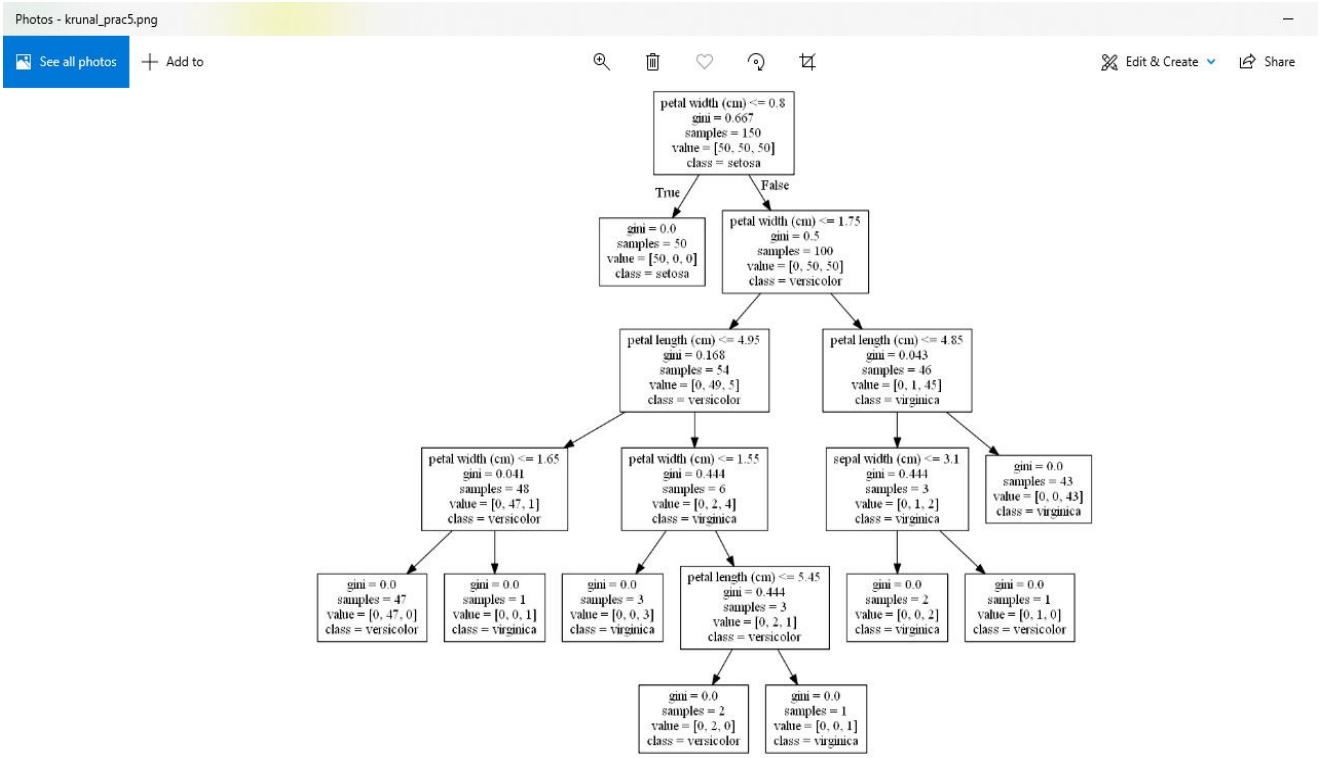
CODE:

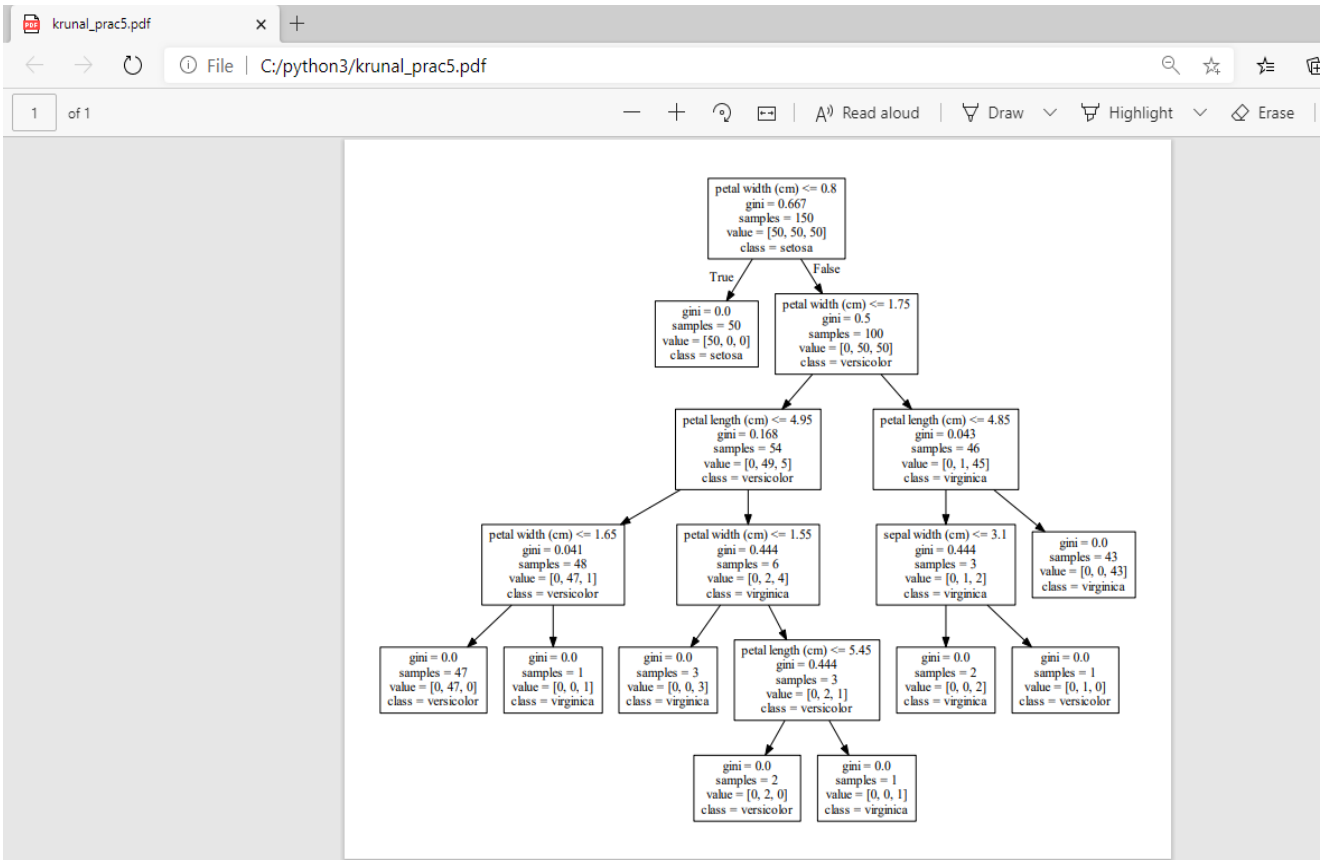
```
from sklearn.tree import DecisionTreeClassifier
from sklearn import datasets
from IPython.display import Image
from sklearn import tree
import os #only for windows
import pydotplus

os.environ['PATH'] += os.pathsep+ "C:/graphviz-2.38/release/bin/"
iris=datasets.load_iris()
x=iris.data
y=iris.target
clf=DecisionTreeClassifier(random_state=0)
```

```
model=clf.fit(x,y)
dot_data=tree.export_graphviz(clf,out_file=None,feature_names=iris.feature_names,class_names=iris.target_names)
graph =pydotplus.graph_from_dot_data(dot_data)
Image(graph.create_png())
graph.write_pdf("krunal_prac5.pdf")
graph.write_png("krunal_prac5.png")
```

OUTPUT:






krunal_prac5.pdf
File | C:/python3/krunal_prac5.pdf
1 of 1
Read aloud
Draw
Highlight
Erase
petal width (cm) <= 0.8
gini = 0.667
samples = 150
value = [50, 50, 50]
class = setosa
True
False
gini = 0.0
samples = 50
value = [50, 0, 0]
class = setosa
petal width (cm) <= 1.75
gini = 0.5
samples = 100
value = [0, 50, 50]
class = versicolor
petal length (cm) <= 4.95
gini = 0.168
samples = 54
value = [0, 49, 5]
class = versicolor
petal length (cm) <= 4.85
gini = 0.043
samples = 46
value = [0, 1, 45]
class = virginica
petal width (cm) <= 1.65
gini = 0.041
samples = 48
value = [0, 47, 1]
class = versicolor
petal width (cm) <= 1.55
gini = 0.444
samples = 6
value = [0, 2, 4]
class = virginica
sepal width (cm) <= 3.1
gini = 0.444
samples = 3
value = [0, 1, 2]
class = virginica
gini = 0.0
samples = 43
value = [0, 0, 43]
class = virginica
gini = 0.0
samples = 47
value = [0, 47, 0]
class = versicolor
gini = 0.0
samples = 1
value = [0, 0, 1]
class = virginica
gini = 0.0
samples = 3
value = [0, 0, 3]
class = virginica
petal length (cm) <= 5.45
gini = 0.444
samples = 3
value = [0, 2, 1]
class = versicolor
gini = 0.0
samples = 2
value = [0, 0, 2]
class = virginica
gini = 0.0
samples = 1
value = [0, 1, 0]
class = versicolor
gini = 0.0
samples = 2
value = [0, 2, 0]
class = versicolor
gini = 0.0
samples = 1
value = [0, 0, 1]
class = virginica