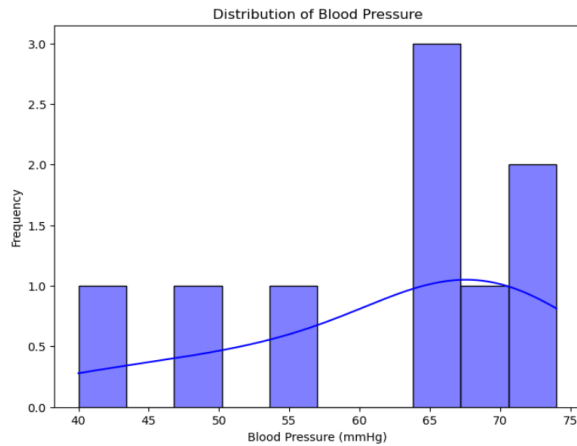


Lab 3 – Classification

1. Naïve Bayes

Output:

Name: Jiya Hona
Symbol No: 29097/078
Lab: Naïve Bayes Classifier
Dataset Size: 9



Feature Importance (Standard Deviation):

Pregnancies: 3.46
Glucose: 42.50
BloodPressure: 11.24
SkinThickness: 17.57
Insulin: 177.15
BMI: 6.00
DiabetesPedigreeFunction: 0.69
Age: 10.64

Confusion Matrix:

```
[[0 1]
 [0 2]]
```

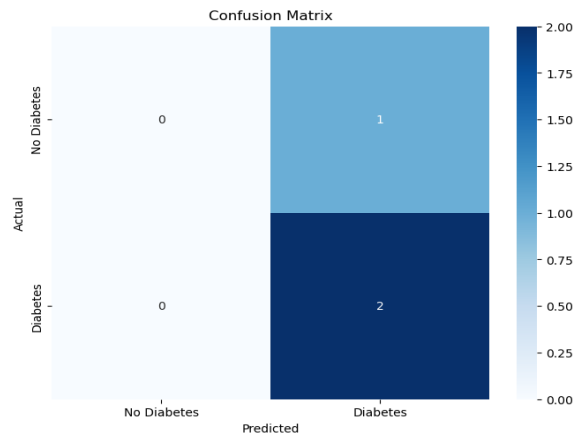
Classification Report:

	precision	recall	f1-score	support
No Diabetes	0.00	0.00	0.00	1
Diabetes	0.67	1.00	0.80	2
accuracy			0.67	3
macro avg	0.33	0.50	0.40	3
weighted avg	0.44	0.67	0.53	3

Enter new patient data to predict Diabetes:

Enter Pregnancies: 2
Enter Glucose: 130
Enter BloodPressure: 80
Enter SkinThickness: 30
Enter Insulin: 120
Enter BMI: 33.6
Enter DiabetesPedigreeFunction: 0.627
Enter Age: 45

Prediction: Diabetes



2. ID3 Decision Tree Classifier

Output:

```
Name: Jiya Honaa
Symbol No: 29097/078
Lab: ID3 Decision Tree Classifier
Training Confusion Matrix:
[[34  2]
 [18 26]]

Training Classification Report:
              precision    recall  f1-score   support

     0       0.65       0.94       0.77        36
     1       0.93       0.59       0.72        44

 accuracy          0.75        80
 macro avg         0.79        80
 weighted avg      0.80        80

Training Accuracy: 0.75

Test Confusion Matrix:
[[10  1]
 [ 7  2]]

Test Classification Report:
              precision    recall  f1-score   support

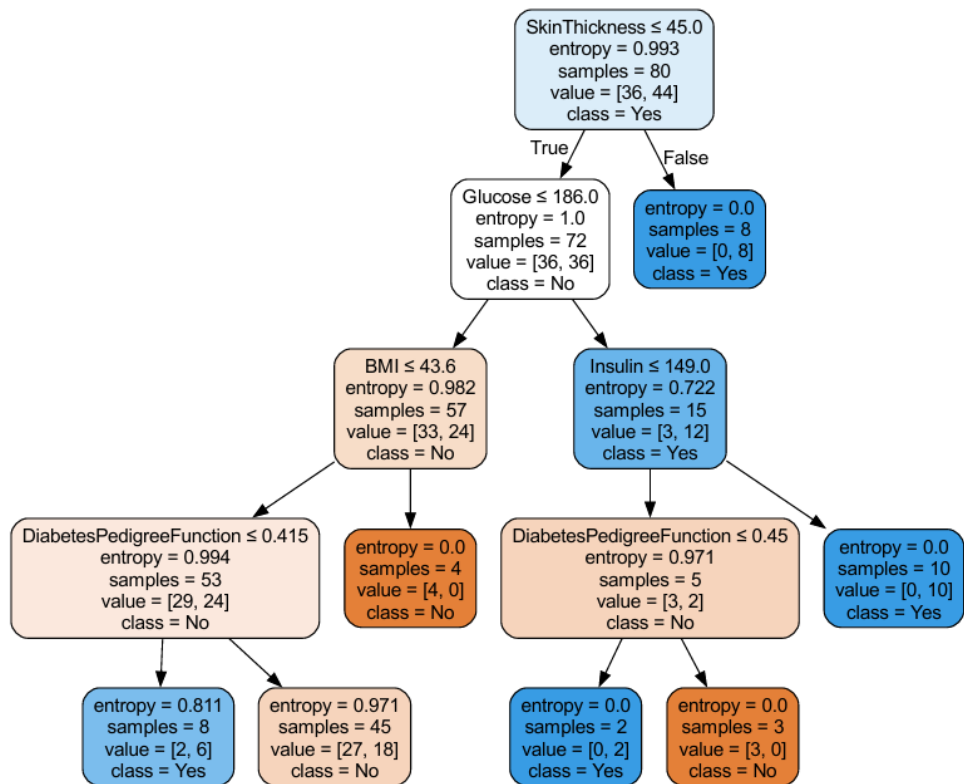
     0       0.59       0.91       0.71        11
     1       0.67       0.22       0.33         9

 accuracy          0.60        20
 macro avg         0.63        20
 weighted avg      0.62        20

Test Accuracy: 0.6

Feature Importance:
Pregnancies: 0.0000
Glucose: 0.1779
BloodPressure: 0.0000
SkinThickness: 0.2538
Insulin: 0.2043
BMI: 0.1133
DiabetesPedigreeFunction: 0.2507
Age: 0.0000
```

[4]: 'diabetes_id3_tree.pdf'



3. Classifiers Comparison

Output:

Name: Jiya Hona
Symbol No: 29097/078

Naive Bayes vs Decision Tree Classifier Performance:

Naive Bayes Accuracy: 0.80
Decision Tree Accuracy: 0.78
Naive Bayes ROC AUC: 0.80
Decision Tree ROC AUC: 0.79
Naive Bayes CV Accuracy: 0.79 (± 0.00)
Decision Tree CV Accuracy: 0.79 (± 0.01)

Confusion Matrix - Naive Bayes:

```
[[132  28]
 [ 31 109]]
```

Confusion Matrix - Decision Tree:

```
[[119  41]
 [ 24 116]]
```

Naive Bayes Classification Report:

	precision	recall	f1-score	support
0	0.81	0.82	0.82	160
1	0.80	0.78	0.79	140
accuracy			0.80	300
macro avg	0.80	0.80	0.80	300
weighted avg	0.80	0.80	0.80	300

Decision Tree Classification Report:

	precision	recall	f1-score	support
0	0.83	0.74	0.79	160
1	0.74	0.83	0.78	140
accuracy			0.78	300
macro avg	0.79	0.79	0.78	300
weighted avg	0.79	0.78	0.78	300

