מטלה- 1

חלק ב:-

Decision Tree Experments:

1.**DecisionTreeClassifier():**

```
Accuracy: 0.9122807017543859
Precision: 0.9514563106796117
Recall: 0.9074074074074074
F1 Score: 0.9289099526066351
Confusion Matrix:
 [[58  5]
 [10 98]]
```

2.DecisionTreeClassifier(criterion='entropy'):

```
Accuracy: 0.9590643274853801
Precision: 0.954954954954955
Recall: 0.9814814814814815
F1 Score: 0.9680365296803652
Confusion Matrix:
 [[ 58   5]
 [  2 106]]
```

3.DecisionTreeClassifier(max_depth=6):

```
Accuracy: 0.9590643274853801
Precision: 0.9719626168224299
Recall: 0.9629629629629629
F1 Score: 0.9674418604651163
Confusion Matrix:
 [[ 60   3]
 [  4 104]]
```

4.DecisionTreeClassifier(random_state=0):

```
Accuracy: 0.9239766081871345
Precision: 0.9702970297029703
Recall: 0.9074074074074074
F1 Score: 0.937799043062201
Confusion Matrix:
 [[60  3]
 [10 98]]
```

5.DecisionTreeClassifier(criterion='entropy',random_state=0,max_depth=6):

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix: [[ 59   4]
 [  2 106]]
```

6. DecisionTreeClassifier(criterion='entropy', max_depth=6):

```
Accuracy: 0.9590643274853801
Precision: 0.954954954954955
Recall: 0.9814814814814815
F1 Score: 0.9680365296803652
Confusion Matrix:
 [[ 58   5]
 [  2 106]]
```

7. DecisionTreeClassifier(randome_state=0, max_depth=6):

```
Accuracy: 0.9415204678362573
Precision: 0.9622641509433962
Recall: 0.9444444444444444
F1 Score: 0.9532710280373832
Confusion Matrix:
[[ 59   4]
 [  6 102]
```

8. DecisionTreeClassifier(splitter='random',max_depth=6):

```
Accuracy: 0.9415204678362573
Precision: 0.9454545454545454
Recall: 0.9629629629629629
F1 Score: 0.9541284403669725
Confusion Matrix:
[[ 57   6]
 [  4 104]]
```

9. DecisionTreeClassifier(splitter='random', criterion='entropy'):

```
Accuracy: 0.9064327485380117
Precision: 0.9423076923076923
Recall: 0.9074074074074074
F1 Score: 0.9245283018867925
Confusion Matrix:
 [[57  6]
 [10 98]]
```

Random Forest Experments:

1.RandomForestClassifier():

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix:
[[ 59   4]
 [  2 106]]
```

2.RandomForestClassifier(criterion='entropy'):

```
Accuracy: 0.9707602339181286
Precision: 0.963963963963964
Recall: 0.9907407407407407
F1 Score: 0.9771689497716894
Confusion Matrix:
[[ 59   4]
 [  1 107]]
```

3.RandomForestClassifier(random_state=0):

```
Accuracy: 0.9707602339181286
Precision: 0.963963963963964
Recall: 0.9907407407407407
F1 Score: 0.9771689497716894
Confusion Matrix:
 [[ 59   4]
 [  1 107]]
```

4.RandomForestClassifier(max_depth=6):

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix:
 [[ 59   4]
 [  2 106]]
```

5. RandomForestClassifier(random_state=0,max_depth=6):

```
Accuracy: 0.9707602339181286
Precision: 0.963963963963964
Recall: 0.9907407407407407
F1 Score: 0.9771689497716894
Confusion Matrix:
 [[ 59   4]
[  1 107]]
```

6.RandomForestClassifier(**criterion='entropy'**,random_state=0):

```
Accuracy: 0.9707602339181286
Precision: 0.963963963963964
Recall: 0.9907407407407407
F1 Score: 0.9771689497716894
Confusion Matrix:
 [[ 59   4]
 [  1 107]]
```

7.RandomForestClassifier(bootstrap=False):

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix:
[[ 59   4]
 [  2 106]]
```

8.RandomForestClassifier(criterion='entropy',bootstrap=False):

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix:
[[ 59   4]
 [  2 106]
```

AdaBoost Experments:

1.AdaBoostClassifier() :

```
Accuracy: 0.9766081871345029
Precision: 0.9814814814814815
Recall: 0.9814814814814815
F1 Score: 0.9814814814814815
Confusion Matrix:
 [[ 61   2]
 [  2 106]]
```

2. AdaBoostClassifier(random_state=0):

```
Accuracy: 0.9649122807017544
Precision: 0.9636363636363636
Recall: 0.9814814814814815
F1 Score: 0.9724770642201835
Confusion Matrix:
[[ 59   4]
 [  2 106]]
```

3. AdaBoostClassifier(learning_rate=6.0):

```
Accuracy: 0.9064327485380117
Precision: 0.9423076923076923
Recall: 0.9074074074074074
F1 Score: 0.9245283018867925
Confusion Matrix:
[[57  6]
 [10 98]]
```

4. **AdaBoostClassifier(n_estimators=100):**

```
Accuracy: 0.9824561403508771
Precision: 0.9906542056074766
Recall: 0.9814814814814815
F1 Score: 0.986046511627907
Confusion Matrix:
[[ 62   1]
 [  2 106]]
```

5.AdaBoostClassifier(n_estimators=100,random_state=0):

```
Accuracy: 0.9824561403508771
Precision: 0.9906542056074766
Recall: 0.9814814814814815
F1 Score: 0.986046511627907
Confusion Matrix:
[[ 62   1]
 [  2 106]]
```

6.AdaBoostClassifier(n_estimators=100,learning_rate=6.0):

```
Accuracy: 0.9122807017543859
Precision: 0.8974358974358975
Recall: 0.9722222222222222
F1 Score: 0.9333333333333333
Confusion Matrix:
[[ 51  12]
 [  3 105]]
```

7.AdaBoostClassifier(random_state=0,learning_rate=6.0):

```
Accuracy: 0.9064327485380117
Precision: 0.9423076923076923
Recall: 0.9074074074074074
F1 Score: 0.9245283018867925
Confusion Matrix:
[[57  6]
 [10 98]]
```