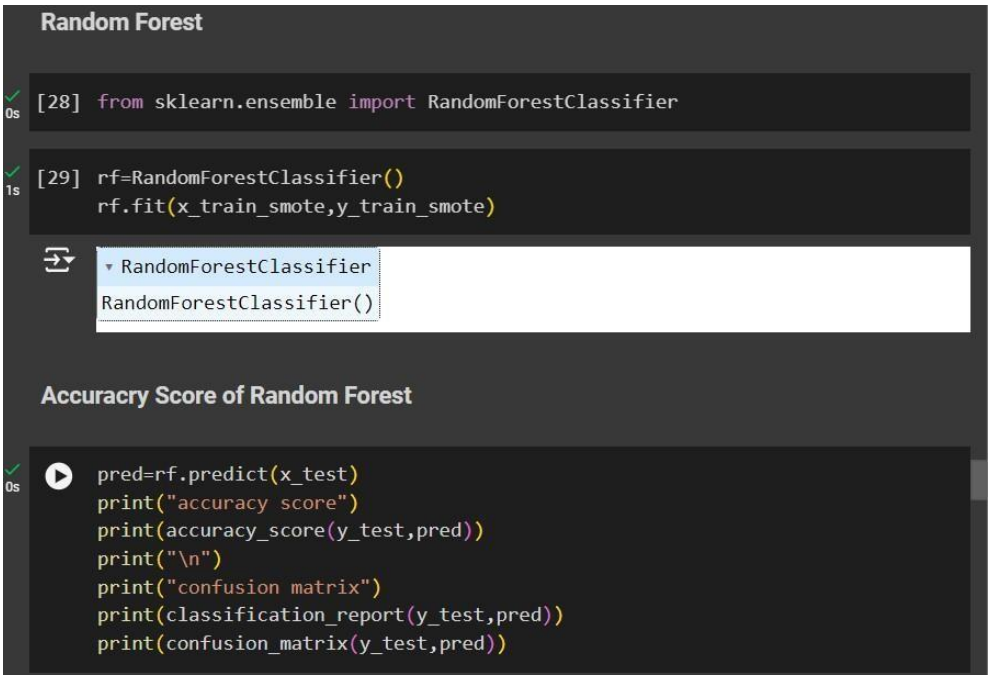
Model Development Phase Template

Date	06-07-2024
Team ID	739733
Project Title	Fetal AI: Using Machine Learning to Predict and Monitor Fetal Health
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:



Decision Tree

```
[32] from sklearn.tree import DecisionTreeClassifier
```

```
dt=DecisionTreeClassifier()
dt.fit(x_train_smote,y_train_smote)
pred=dt.predict(x_test)
print("accuracy score")
print(accuracy_score(y_test,pred))
print("\n")
print("confusion matrix")
print(classification_report(y_test,pred))
```

Logistic Regression

```
[35] from sklearn.linear_model import LogisticRegression
```

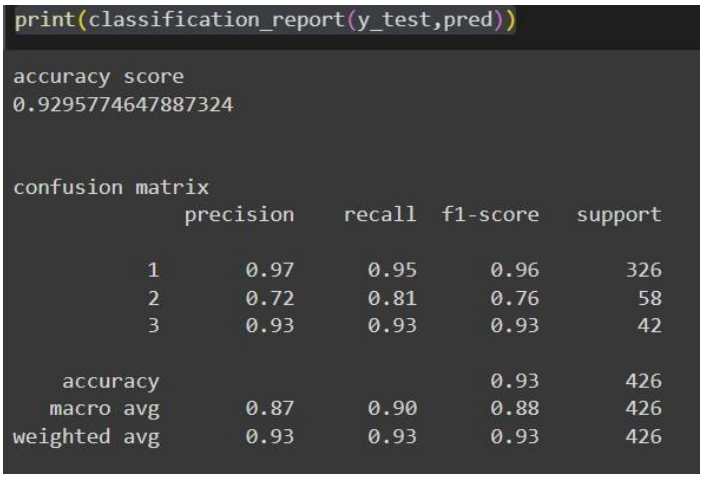
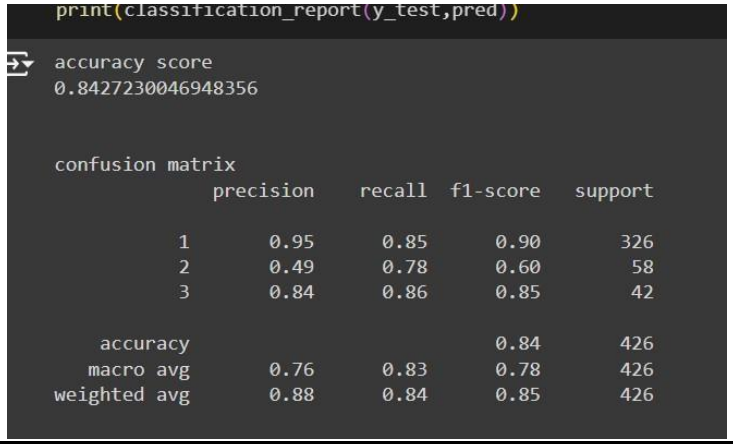
```
[36] lr=LogisticRegression()
     lr.fit(x_train_smote,y_train_smote)
     pred=lr.predict(x_test)
     print("accuracy score")
     print(accuracy_score(y_test,pred))
     print("\n")
     print("confusion matrix")
```

k-Nearest Neighbors

```
[38] from sklearn.neighbors import KNeighborsClassifier
```

```
knn=KNeighborsClassifier(n_neighbors=5)
knn.fit(x_train_smote,y_train_smote)
pred=knn.predict(x_test)
print("accuracy score")
print(accuracy_score(y_test,pred))
print("\n")
print("confusion matrix")
print(classification_report(y_test,pred))
```

Model Validation and Evaluation Report:

Model	Classification Report/ Confusion Matrix	F1 score
Decision Tree		92%
KNN		77%

<table>
<tr>
<td>Random Forest</td>
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```
print(confusion_matrix(y_test,pred))

accuracy score
Code cell output actions

confusion matrix
              precision    recall  f1-score   support

           1       0.96      0.97      0.97       326
           2       0.81      0.76      0.79        58
           3       0.89      0.93      0.91        42

    accuracy                           0.94       426
   macro avg       0.89      0.89      0.89       426
weighted avg       0.94      0.94      0.94       426
```

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<tr>
<td>Logistic Regression</td>
<td>

```
print(classification_report(y_test,pred))

accuracy score
0.7746478873239436


confusion matrix
              precision    recall  f1-score   support

           1       0.94      0.79      0.86       326
           2       0.39      0.67      0.50        58
           3       0.62      0.83      0.71        42

    accuracy                           0.77       426
   macro avg       0.65      0.76      0.69       426
weighted avg       0.84      0.77      0.79       426
```

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<td>78%</td>
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