Model Development Phase Template

Date	24 April 2024
Team ID	739800
Project Title	Predictive Pulse: Harnessing Machine Learning For Blood Pressure Analysis.
Maximum Marks	10 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 a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

Initial Model Training Code (5 marks):

Logistic Regression:

```python
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
from sklearn.metrics import classification_report

logistic_regression = LogisticRegression()
logistic_regression.fit(x_train, y_train)
y_pred = logistic_regression.predict(x_test)

acc_lr = accuracy_score(y_test,y_pred)
c_lr = classification_report(y_test,y_pred)

print('Accuracy Score: ',acc_lr)
print(c_lr)
```

MultinomialNB:

```python
from sklearn.naive_bayes import MultinomialNB

mNB = MultinomialNB()
mNB.fit(x_train, y_train)
y_pred = NB.predict(x_test)

acc_mnb = accuracy_score(y_test,y_pred)
c_mnb = classification_report(y_test,y_pred)

print('Accuracy Score: ',acc_mnb)
print(c_mnb)
```

GaussianNB:

```python
from sklearn.naive_bayes import GaussianNB

NB = GaussianNB()
NB.fit(x_train, y_train)
y_pred = NB.predict(x_test)

acc_nb = accuracy_score(y_test,y_pred)
c_nb = classification_report(y_test,y_pred)

print('Accuracy Score: ',acc_nb)
print(c_nb)
```

Decision Tree:

```python
from sklearn.tree import DecisionTreeClassifier


decision_tree_model = DecisionTreeClassifier()
decision_tree_model.fit(x_train, y_train)
y_pred = decision_tree_model.predict(x_test)

acc_dt = accuracy_score(y_test,y_pred)
c_dt = classification_report(y_test,y_pred)

print('Accuracy Score: ',acc_dt)
print(c_dt)
```

Random Forest Regressor:

```python
from sklearn.ensemble import RandomForestClassifier

random_forest = RandomForestClassifier()
random_forest.fit(x_train, y_train)
y_pred = random_forest.predict(x_test)

acc_rf = accuracy_score(y_test,y_pred)
c_rf = classification_report(y_test,y_pred)

print('Accuracy Score: ',acc_rf)
print(c_rf)
```
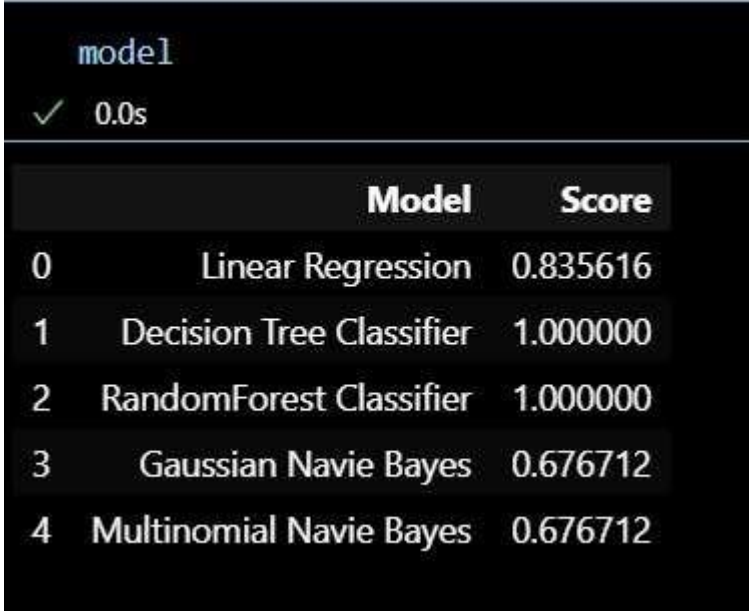
Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics

Logistic Regression, Random forest Regressor, Multinomial NB, Decision Tree, Gaussian Navies Bayes,	The Decision Tree Classifier and Random Forest Classifier both achieved the highest accuracy score of 1.000000, indicating perfect prediction performance on the dataset used. Linear Regression performed well with a score of 0.835616. Both Gaussian and Multinomial Naive Bayes classifiers had lower accuracy scores, each at 0.676712.	

```
model
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```

	Model	Score
0	Linear Regression	0.835616
1	Decision Tree Classifier	1.000000
2	RandomForest Classifier	1.000000
3	Gaussian Navie Bayes	0.676712
4	Multinomial Navie Bayes	0.676712