Model Development Phase Template

Date	20 June 2024
Team ID	739986
Project Title	Customer Acquisition cost estimation using machine learning.
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

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:

```python
from sklearn.metrics import mean_squared_error, r2_score
from sklearn.model_selection import train_test_split
from sklearn import  metrics
from sklearn.ensemble import RandomForestRegressor
rf = RandomForestRegressor()
rf.fit(train_X,train_y)
print('Attempting to fit Random Forest Regressor')
```

Model	Classification Report	F1 Score	Confusion Matrix

| Random Forest | ```python
from sklearn.metrics import mean_squared_error, r2_score
from sklearn.model_selection import train_test_split
from sklearn import  metrics
from sklearn.ensemble import RandomForestRegressor
rf = RandomForestRegressor()
rf.fit(train_X,train_y)
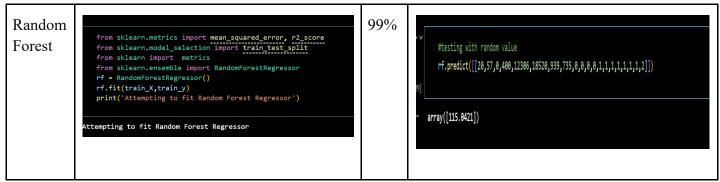print('Attempting to fit Random Forest Regressor')

Attempting to fit Random Forest Regressor
``` | 99% | ```python
#testing with random value
rf.predict([[20,57,0,400,12306,18520,939,735,0,0,0,0,1,1,1,1,1,1,1,2]])

array([115.0421])
``` |

Model Validation and Evaluation Report:

| Random Forest | ```python
from sklearn.metrics import mean_squared_error, r2_score
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array([115.0421])
``` |
| Linear Regression | ```python
y_pred_val_lr = lr.predict(val_X)
print('MAE on Validation set :',metrics.mean_absolute_error(val_y, y_pred_val_lr))
print("\n")
print('MSE on Validation set :',metrics.mean_squared_error(val_y, y_pred_val_lr))
print("\n")
print('RMSE on Validation set :',np.sqrt(metrics.mean_absolute_error(val_y, y_pred_val_lr)))
print("\n")
print('R2 Score on Validation set :',metrics.r2_score(val_y, y_pred_val_lr))
print("\n")

MAE on Validation set : 25.212882223695512

MSE on Validation set : 862.7559482129169
``` | 20% | ```python
lr = LinearRegression()
lr.fit(train_X,train_y)
print('Attempting to fit Linear Regressor

Attempting to fit Linear Regressor
``` |