**Model Development Phase Template**

|  |  |
| --- | --- |
| Date | 5th July 2024 |
| Team ID | 739808 |
| Project Title | Cost Prediction of Acquiring a Customer. |
| 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:**

RandomForest Regressor:

from sklearn.ensemble import RandomForestRegressor

rf=RandomForestRegressor()

rf.fit(X1\_train,Y\_train)

y\_pred=rf.predict(X1\_test)

x\_pred=rf.predict(X1\_train)

score=r2\_score(Y\_test,y\_pred)

rmse=np.sqrt(mean\_squared\_error(Y\_test,y\_pred))

score1=r2\_score(Y\_train,x\_pred)

rmse1=np.sqrt(mean\_squared\_error(Y\_train,x\_pred))

DecisionTree Regressor:

from sklearn.tree import DecisionTreeRegressor

from sklearn.metrics import r2\_score,mean\_squared\_error,mean\_absolute\_error

Dtr=DecisionTreeRegressor()

Dtr.fit(X1\_train,Y\_train)

y\_pred=Dtr.predict(X1\_test)

x\_pred=Dtr.predict(X1\_train)

score=r2\_score(Y\_test,y\_pred)

rmse=np.sqrt(mean\_squared\_error(Y\_test,y\_pred))

score1=r2\_score(Y\_train,x\_pred)

rmse1=np.sqrt(mean\_squared\_error(Y\_train,x\_pred))

mae=mean\_absolute\_error(Y\_test,y\_pred)

mse=mean\_squared\_error(Y\_test,y\_pred)

Gradient BoostingRegressor:

from sklearn.ensemble import GradientBoostingRegressor

gb=GradientBoostingRegressor()

gb.fit(X1\_train,Y\_train)

y\_pred=gb.predict(X1\_test)

x\_pred=rf.predict(X1\_train)

score=r2\_score(Y\_test,y\_pred)

rmse=np.sqrt(mean\_squared\_error(Y\_test,y\_pred))

score1=r2\_score(Y\_train,x\_pred)

rmse1=np.sqrt(mean\_squared\_error(Y\_train,x\_pred))

**Model Validation and Evaluation Report:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model** | **Classification Report** | **Accuracy** | **Confusion Matrix** |
| Random  Forest  Regressor |  | 99% | - |
| Decision  Tree  Regressor |  | 99% | - |
| Gradient  Boosting  Regressor |  | 99% | - |