Model Development Phase Template

Date	July 2024
Team ID	739670
Project Title	Smart Home Temperature prediction using Machine Learning
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):

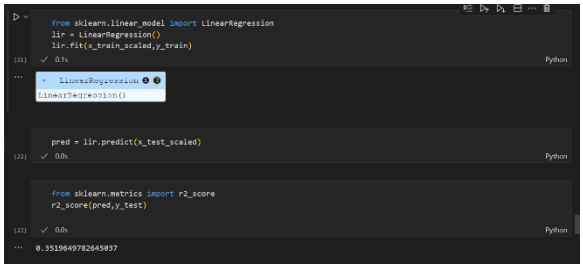
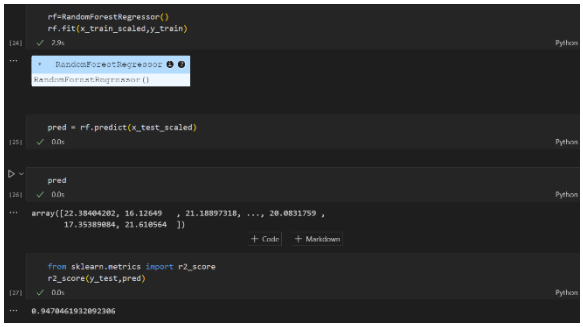
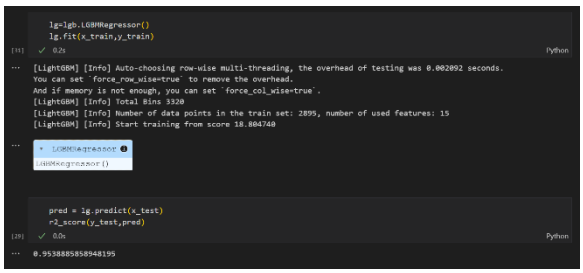
```
from sklearn.linear_model import LinearRegression
lir = LinearRegression()
lir.fit(x_train_scaled,y_train)
pred = lir.predict(x_test_scaled)
from sklearn.metrics import r2_score
r2_score(pred,y_test)
```

```
rf=RandomForestRegressor()
rf.fit(x_train_scaled,y_train)
pred = rf.predict(x_test_scaled)
pred
from sklearn.metrics import r2_score
r2_score(y_test,pred)
```

```
lg=lgb.LGBMRegressor()
lg.fit(x_train,y_train)
pred=lg.predict(x_test)
r2_score(y_test,pred)
```

```
xg=xgb.XGBRegressor()
xg.fit(x_train,y_train)
pred=xg.predict(x_test)
r2_score(y_test,pred)
```

Model Evaluation and Validation Report(5 marks):

Model	Summary	Training and Validation Performance Metrics
Model 1	Linear Regressor model typically that assumes a linear relationship between input variables and temperature.	
Model 2	Random forest classifier, an ensemble learning method that builds multiple decision trees and merges them together to get a more accurate prediction.	
Model 3	LGBM Regressor LightGBM, a gradient boosting framework that uses tree-based learning algorithms, known for its efficiency and speed.	
Model 4	XGB Regressor, an optimized distributed gradient boosting library designed to be highly efficient and portable.