# Project Development Phase
# Model Performance Test

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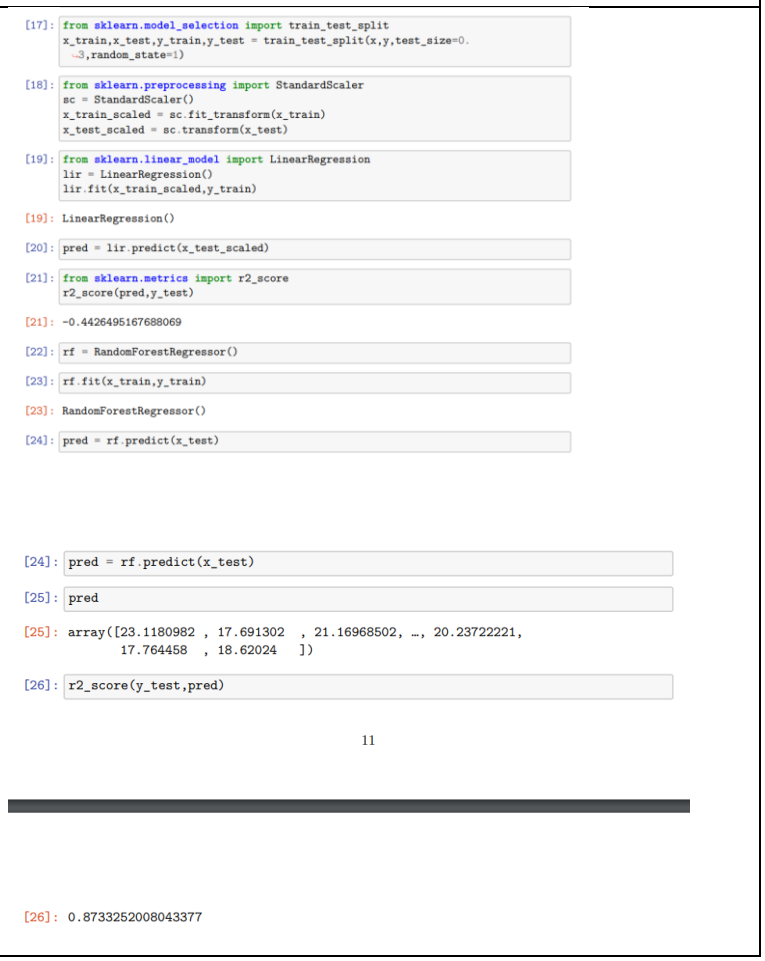
| Date | 19th November 2023 |
| Team ID | TEAM-592016 |
| Project Name | Smart Home – Temperature Prediction |
| Maximum Marks | 10 Marks |

## Model Performance Testing:

The project team shall fill in the following information in the model performance testing template.

| S.No. | Parameter | Values | Screenshot |
|---|---|---|---|
| 1. | Metrics | **Regression Model:** MAE - , MSE - , RMSE - , R2 score - <br><br> **Classification Model:** Confusion Matrix - , Accuray Score- & Classification Report - |  |

```
[17]: from sklearn.model_selection import train_test_split
      x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.
       ↪3,random_state=1)

[18]: from sklearn.preprocessing import StandardScaler
      sc = StandardScaler()
      x_train_scaled = sc.fit_transform(x_train)
      x_test_scaled = sc.transform(x_test)

[19]: from sklearn.linear_model import LinearRegression
      lir = LinearRegression()
      lir.fit(x_train_scaled,y_train)

[19]: LinearRegression()

[20]: pred = lir.predict(x_test_scaled)

[21]: from sklearn.metrics import r2_score
      r2_score(pred,y_test)

[21]: -0.4426495167688069

[22]: rf = RandomForestRegressor()

[23]: rf.fit(x_train,y_train)

[23]: RandomForestRegressor()

[24]: pred = rf.predict(x_test)
```

```
[24]: pred = rf.predict(x_test)

[25]: pred

[25]: array([23.1180982 , 17.691302  , 21.16968502, …, 20.23722221,
             17.764458  , 18.62024   ])

[26]: r2_score(y_test,pred)
```



```
[26]: 0.8733252008043377
```

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| 2. | Tune the Model | Hyperparameter Tuning - Validation Method - | [30]: `r2_score(y_test,pred)`<br>[30]: `0.8569554082913747`<br>[31]: `xg = xgb.XGBRegressor()`<br>[32]: `xg.fit(x_train,y_train)`<br>[32]: `XGBRegressor(base_score=None, booster=None, callbacks=None, colsample_bylevel=None, colsample_bynode=None, colsample_bytree=None, device=None, early_stopping_rounds=None, enable_categorical=False, eval_metric=None, feature_types=None, gamma=None, grow_policy=None, importance_type=None, interaction_constraints=None, learning_rate=None, max_bin=None, max_cat_threshold=None, max_cat_to_onehot=None, max_delta_step=None, max_depth=None, max_leaves=None, min_child_weight=None, missing=nan, monotone_constraints=None, multi_strategy=None, n_estimators=None, n_jobs=None, num_parallel_tree=None, random_state=None, …)`<br>[33]: `pred = xg.predict(x_test)`<br>[34]: `r2_score(y_test,pred)`<br>[34]: `0.8547022627762138` |