

Model Development Phase Template

Date	20 july 2024
Team ID	740063
Project Title	Predicting the energy output of wind turbine based on weather conditions.
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):

```
[45] x = df.drop("Output_Energy",axis=1)
      y = df["Output_Energy"]

[46] print(x.shape, y.shape)
...  (4447, 5) (4447,)

[47] x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=42)

      linreg = LinearRegression()
      linreg.fit(x_train, y_train)
      linreg_y_pred = linreg.predict(x_test)
      print("Mean Squared Error:",mean_squared_error(y_test, linreg_y_pred))
      print("R2 Score:",r2_score(y_test, linreg_y_pred))

...  Mean Squared Error: 360119.0424705109
      R2 Score: 0.8116999208318117
```

Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics
Randomforest	<pre>rf = RandomForestRegressor() rf.fit(x_train, y_train) y_pred = rf.predict(x_test) print("Mean Squared Error:", mean_squared_error(y_test, y_pred)) print("R2 Score:", r2_score(y_test, y_pred))</pre> <p>Mean Squared Error: 63927.16908857864 R2 Score: 0.9665735782318059</p>	<pre>svm = SVR() svm.fit(x_train, y_train) y_pred = svm.predict(x_test) print(mean_squared_error(y_test, y_pred)) print(r2_score(y_test, y_pred))</pre> <p>1830923.5162077667 0.04264145353809867</p>
GradientBoostingRegression	<pre>from sklearn.ensemble import GradientBoostingRegressor gbr = GradientBoostingRegressor() gbr.fit(x_train, y_train) y_pred = gbr.predict(x_test) print(r2_score(y_test, y_pred))</pre> <p>0.9593288014515995</p>	<pre>svm = SVR() svm.fit(x_train, y_train) y_pred = svm.predict(x_test) print(mean_squared_error(y_test, y_pred)) print(r2_score(y_test, y_pred))</pre> <p>1830923.5162077667 0.04264145353809867</p>