

Model Development Phase Template

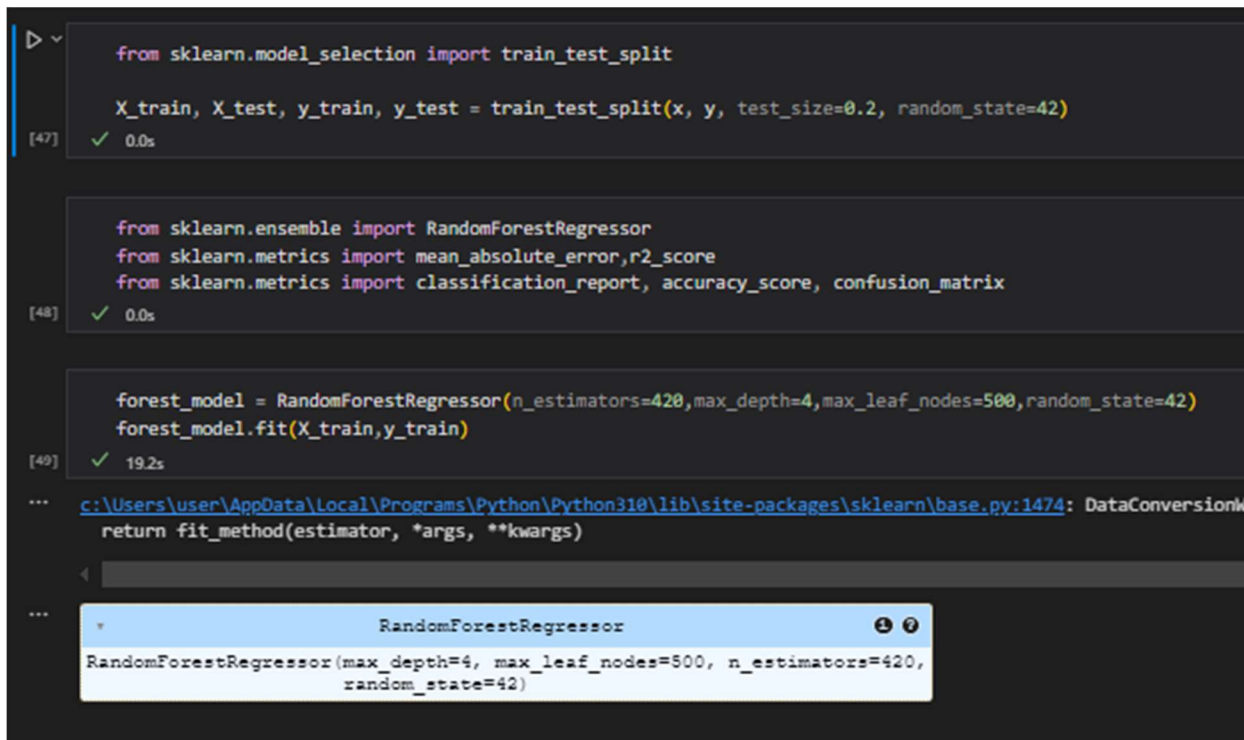
Date	17 July 2024
Team ID	XXXXXX
Project Title	Predicting The Energy Output Of Wind Turbine Based On Weather Condition
Maximum Marks	4 Marks

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 Mean Absolute Error, R2 Score for multiple models, presented through respective screenshots.

Initial Model Training Code:

1. Random Forest Regressor



```

from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=42)

[47] ✓ 0.0s

from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_absolute_error, r2_score
from sklearn.metrics import classification_report, accuracy_score, confusion_matrix

[48] ✓ 0.0s

forest_model = RandomForestRegressor(n_estimators=420, max_depth=4, max_leaf_nodes=500, random_state=42)
forest_model.fit(X_train, y_train)

[49] ✓ 19.2s

... c:\Users\user\AppData\Local\Programs\Python\Python310\lib\site-packages\sklearn\base.py:1474: DataConversionWarning:
return fit_method(estimator, *args, **kwargs)

...
RandomForestRegressor
RandomForestRegressor(max_depth=4, max_leaf_nodes=500, n_estimators=420,
random_state=42)

```

2. Linear Regression

```
from sklearn.linear_model import LinearRegression
linear_model = LinearRegression()
linear_model.fit(X_train,y_train)
```

[62] ✓ 0.0s

...

LinearRegression ⓘ ?

LinearRegression()

Model Validation and Evaluation Report:

Model	Mean Absolute Error	R2 Score
Random Forest Regressor	<pre># Calculate MAE mae = mean_absolute_error(y_test, y_pred) print("Mean Absolute Error:", mae)</pre> <p>[57] ✓ 0.0s</p> <p>... Mean Absolute Error: 168.2878243574892</p>	<pre># Calculate R-squared r2 = r2_score(y_test, y_pred) print("R-squared:", r2)</pre> <p>[58] ✓ 0.0s</p> <p>... R-squared: 0.9057747588993108</p>
Linear Regression	<pre># Calculate MAE mae = mean_absolute_error(y_test, y_pred) print("Mean Absolute Error:", mae)</pre> <p>[60] ✓ 0.0s</p> <p>... Mean Absolute Error: 188.7111236216099</p>	<pre># Calculate R-squared r2 = r2_score(y_test, y_pred) print("R-squared:", r2)</pre> <p>[61] ✓ 0.0s</p> <p>... R-squared: 0.8997953576462828</p>