

Model Development Phase Template

Date	12 July 2024
Team ID	SWTID1720108739
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 classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

```
[34]: #importing and building LinearRegression, RandomForestRegressor, DecisionTreeRegressor, GradientBoostingRegressor, r2_score, mean_squared_error
from sklearn.linear_model import LinearRegression
from sklearn.ensemble import RandomForestRegressor
from sklearn.tree import DecisionTreeRegressor
from sklearn.ensemble import GradientBoostingRegressor
from sklearn.metrics import r2_score, mean_squared_error

[108]: model_name=[]
r2score=[]
rmse=[]
models=[
    GradientBoostingRegressor(random_state=50),
    RandomForestRegressor(random_state=50),
    LinearRegression(),
    DecisionTreeRegressor(random_state=50),
]

for model in models:
    model.fit(x_train, y_train)
    y_pred = model.predict(x_test)
    model_name.append(model.__class__.__name__)
    r2score.append(str(r2_score(y_test, y_pred) * 100))
    rmse.append(str(mean_squared_error(y_test, y_pred, squared=False)))

[110]: models_df = pd.DataFrame({"Model-Name":model_name, "R2_score": r2score, 'RMSE':rmse})
models_df = models_df.astype({"R2_score": float, "RMSE": float})
models_df.sort_values("R2_score", ascending = False)
```

Model Validation and Evaluation Report:

Model	Regression Report	Accuracy	Confusion Matrix
Random Forest	1 RandomForestRegressor 97.379044 213.403910	97.379044	-
Decision Tree	3 DecisionTreeRegressor 95.034559 293.732117	95.034559	-
Gradient Boosting	0 GradientBoostingRegressor 94.679787 304.044413	94.679787	-
Linear Regression	2 LinearRegression 90.605069 404.035323	90.605069	-