

Model Development Phase Template

Date	15 March 2024
Team ID	SWTID1720007638
Project Title	Predicting CO2 emissions by countries using Machine Learning
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:

Model Building

```
[65]: model = RandomForestRegressor(n_estimators=10,random_state=52,n_jobs=-1,verbose=2)

[66]: model.fit(x_train, y_train.values.ravel())

building tree 1 of 10
building tree 2 of 10
building tree 3 of 10
building tree 4 of 10
building tree 5 of 10
building tree 6 of 10
building tree 7 of 10
building tree 8 of 10
building tree 9 of 10
building tree 10 of 10

[Parallel(n_jobs=-1)]: Using backend ThreadingBackend with 16 concurrent workers.
[Parallel(n_jobs=-1)]: Done 3 out of 10 | elapsed: 36.7s remaining: 1.4min
[Parallel(n_jobs=-1)]: Done 10 out of 10 | elapsed: 37.5s finished

[66]: ▼ RandomForestRegressor
RandomForestRegressor(n_estimators=10, n_jobs=-1, random_state=52, verbose=2)

[135]: y_pred = model.predict(x_test)

[Parallel(n_jobs=10)]: Using backend ThreadingBackend with 10 concurrent workers.
[Parallel(n_jobs=10)]: Done 3 out of 10 | elapsed: 2.1s remaining: 5.1s
[Parallel(n_jobs=10)]: Done 10 out of 10 | elapsed: 2.1s finished

[139]: score = model.score(x_train, y_train)
score

[Parallel(n_jobs=10)]: Using backend ThreadingBackend with 10 concurrent workers.
[Parallel(n_jobs=10)]: Done 3 out of 10 | elapsed: 8.7s remaining: 20.4s
[Parallel(n_jobs=10)]: Done 10 out of 10 | elapsed: 8.8s finished

[139]: 0.9896977096382289
```

Model Validation and Evaluation Report:

Model	Accuracy
Random Forest	0.9896
Ridge Regression	0.02462
Polynomial Regression	0.123330