Model Development Phase Template

Date	17 July 2024
Project Title	Machine learning approach for predicting the price of natural gas
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:

Paste the screenshot of the model training code

```
[11]
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=2)

[12]
from sklearn.linear_model import LinearRegression

[13]
lr = LinearRegression()

[14]
lr.fit(X_train, y_train)
```

```
▾ LinearRegression
LinearRegression()
```

```
[15]
y_pred = lr.predict(X_test)
y_pred
```

```
array([[4.51472486],
       [4.59457551],
       [4.75721005],
       ...,
       [3.88764252],
       [4.84084556],
       [4.43592319]])
```

```
[16]
from sklearn.metrics import r2_score
lr_accuracy = r2_score(y_test, y_pred)
lr_accuracy
```

```
0.02250377696034711
```

```
[17]  from sklearn.tree import DecisionTreeRegressor

[18]  dtr = DecisionTreeRegressor()
      dtr.fit(X_train, y_train)

...   ▾ DecisionTreeRegressor
      DecisionTreeRegressor()

[19]  y_pred2 = dtr.predict(X_test)
      y_pred2

...   array([6.09, 1.97, 2.42, ..., 4.58, 2.21, 5.79])

[20]  from sklearn.metrics import r2_score
      dtr_accuracy = r2_score(y_test, y_pred2)
      dtr_accuracy

...   0.9875283332668645
```

Model Validation and Evaluation Report:

Model	R2_Score	Accuracy
Linear Regression	`[16] from sklearn.metrics import r2_score lr_accuracy = r2_score(y_test, y_pred) lr_accuracy` → `0.022503776960347 11`	0.022503776960347 11
Decision Tree Regression	`[20] from sklearn.metrics import r2_score dtr_accuracy = r2_score(y_test, y_pred2) dtr_accuracy` → `0.9875283332668645`	0.9875283332668645