

Model Development Phase Template

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| 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

```
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)

from sklearn.linear_model import LinearRegression

lr = LinearRegression()

lr.fit(X_train, y_train)

> LinearRegression
LinearRegression()

> y_pred = lr.predict(X_test)
y_pred
array([[4.51472486],
       [4.59457551],
       [4.75721005],
       ...,
       [3.88764252],
       [4.84084556],
       [4.43592319]])

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 | <pre>[16] from sklearn.metrics import r2_score lr_accuracy = r2_score(y_test, y_pred) lr_accuracy ... 0.02250377696034711</pre> | 0.02250377696034711 |
| Decision Tree Regression | <pre>[20] from sklearn.metrics import r2_score dtr_accuracy = r2_score(y_test, y_pred2) dtr_accuracy ... 0.9875283332668645</pre> | 0.9875283332668645 |