**Model Development Phase Template**

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| Date | 21 June 2024 |
| Team ID | 739784 |
| Project Title | Gem Valuation Revolution: Predicting Diamond Prices With Artificial Neural Networks |
| Maximum Marks | 4 Marks |

**Initial Model Training Code, Model Validation and Evaluation Report**

The initial RandomForestRegressor model shows promising results in predicting diamond prices based on the selected features. Further optimization, feature engineering, and model tuning may enhance performance. Future steps include refining hyperparameters, exploring feature importance, and validating the model on additional datasets for robustness and generalization.

Top of Form

Bottom of Form

**Initial Model Training Code:**

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

df = pd.read\_csv('/content/diamonds.csv')

X= label\_data.drop(["price"],axis =1)

y= label\_data["price"]

# Import train\_test\_split

from sklearn.model\_selection import train\_test\_split

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y,test\_size=0.25, random\_state=7)

from sklearn.pipeline import Pipeline # Import the Pipeline class

from sklearn.preprocessing import StandardScaler

from sklearn.linear\_model import LinearRegression

from sklearn.tree import DecisionTreeRegressor

from sklearn.ensemble import RandomForestRegressor

from sklearn.neighbors import KNeighborsRegressor

from xgboost import XGBRegressor

from sklearn.model\_selection import cross\_val\_score # Import cross\_val\_score

 #Fit the pipelines

for pipe in pipelines:

    pipe.fit(X\_train, y\_train)

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| **Model** | **Classification Report** | **F1**  **Scor e** | **Confusion Matrix** |
| Random  Forest | - | - |  |

**Model Validation and Evaluation Report:**

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| --- | --- | --- | --- |
| Decision  Tree | - |  | - |
| KNN | - |  | - |
| Gradient  Boosting | - |  | - |