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| --- | --- | --- | --- |
| **Model** | **Description** | **Hyperparameters** | **Performance**  **Metric (e.g.,**  **Accuracy, F1**  **Score)** |
| Random  Forest | Ensemble of decision trees; robust, handles complex relationships, reduces overfitting, and provides feature importance for diamond price prediction. | Default parameters | R2 = 0.98 (example value) |
| Simple Decision Tree | Simple tree structure; interpretable, captures non-linear relationships, suitable for initial insights into diamond price patterns. | Default parameters | R2 = 0.73 (example value) |
| KNN | Classifies based on nearest neighbors; adapts well to data patterns, effective for predicting diamond prices based on similar instances in the dataset. | Default parameters | R2 = 0.77 (example value) |

**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 | 6 Marks |

**Model Selection Report**

Based on performance metrics and considerations of model complexity, computational efficiency, and interpretability, recommend the most suitable model for predicting diamond prices. Provide insights into potential improvements, such as hyperparameter tuning, feature engineering, or ensemble methods, to enhance model performance.



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| --- | --- | --- | --- |
| Gradient  Boosting | Gradient boosting with trees; optimizes predictive performance, handles complex relationships, and is suitable for accurate predictions of diamond prices. | Default parameters | R2 = 0.81 (example value) |