Model Optimization and Tuning Phase Report

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| Date | 08 July 2024 |
| Team ID | 740050 |
| Project Title | 3D printer material prediction using machine learning |
| Maximum Marks | 10 Marks |

# Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

# Hyperparameter Tuning Documentation:

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| --- | --- | --- |
| **Model** | **Tuned Hyperparameters** | **Optimal Values** |
| Random Forest | - | - |
| Decision Tree | - | - |
| Logistic Regression | - | - |
| K-Nearest Neighbors | **-** | **-** |

**Performance Metrics Comparison Report :**

|  |  |
| --- | --- |
| **Model** | **Optimized Metric** |
| Random Forest | **-** |
| Decision Tree | **-** |
| Logistic Regression | **-** |
| K-Nearest Neighbors | **-** |

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| **Final Model** | **Reasoning** |
| Decision tree | The Decision tree model was selected for its superior performance, exhibiting accurate results during testing. They are easy to understand and interpret, as the tree structure provides a clear visualization of the decision-making process. This transparency helps in explaining the model to non-technical stakeholders. Decision trees can handle both numerical and categorical data, making them versatile in different applications. They require little data preprocessing, as they do not assume any specific data distribution.  Top of Form  Bottom of Form |

# Final Model Selection Justification (2 marks)