**Model Development Phase Template**

|  |  |
| --- | --- |
| Date | 7 July 2024 |
| Team ID | 740019 |
| Project Title | 3D Printer material prediction using machine learning |
| Maximum Marks | 5 Marks |

**Feature Selection Report Template**

In the forthcoming update, each feature will be accompanied by a brief description. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Feature** | **Description** | | | **Selected (Yes/No)** | | **Reasoning** | |
| Layer height | The height of each individual layer in the print. | | | Yes | | Layer height affects surface quality and strength of the printed object. | |
| Wall thickness | The thickness of the outer walls of the print. | | | Yes | | Wall thickness contributes to the durability and rigidity of the printed part. | |
| Infill density | The density of the internal structure of the print. | | | Yes | | Infill density influences the weight, strength and material usage of the print. | |
| Infill pattern | | The geometric pattern of the infill | Yes | | Infill pattern can affect print time and mechanical properties. | |
| Nozzle temperature | | It provides a measure of central tendency, reflecting the middle value of a dataset when ordered. | Yes | | Nozzle temperature is crucial for proper layer adhesion and print quality. | |
| Bed temperature | | The temperature of the print bed. | Yes | | Bed temperature affects the first layer adhesion and overall print success. | |
| Print speed | | The speed at which the print head moves while printing. | Yes | | Print speed can influence quality and strength of the printed part. | |
| Fan speed  Roughness  Tension strength  elongation | | The speed of the cooling fan used during printing.  A measure of the surface roughness of the print.  The maximum stress the material can withstand while being stretched.  The extent to which the material can stretch before breaking | Yes  Yes  Yes  Yes | | While important, it has a secondary effect compared to other more direct features like temperature like temperature and speed.  Roughness is a direct measure of the surface quality and print finish  Tension strength is critical for determining the mechanical performance of the printed part  Elongation at break is essential for assessing the flexibility and ductility of the material. | |