

**Model Development Phase Template**

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| Date | 9 July 2024 |
| Team ID | team-739821 |
| Project Title | Precise Coffee Quality Prediction |
| 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.

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| **Feature** | **Description** | **Selected (Yes/No)** | **Reasoning** |
| ID | A unique identifier for each record in the dataset. | No | This is a unique identifier and does not provide any meaningful information for predicting coffee quality. |
| Number of Bags | The total number of bags in a given batch of coffee beans. | No | This attribute is more related to logistics and does not influence the sensory quality of the coffee. |
| Bag Weight | The weight of each bag, usually measured in kilograms or pounds. | No | Similar to 'Number of Bags', it relates to logistics rather than coffee quality characteristics. |



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| Variety | The type or breed of coffee plant, such as Arabica, Robusta, etc. | No | While it provides information about the type of coffee plant, it's less directly related to sensory attributes that determine quality. |
| Processing Method | The method used to process the coffee beans post-harvest, e.g., washed, natural, honey. | No | Although it can affect quality, it is a categorical attribute that might complicate the model without providing direct sensory input. |
| Aroma | The fragrance or smell of the coffee, often evaluated on a scale. | No | A key sensory attribute that significantly contributes to the overall coffee quality |
| Flavor | The taste profile of the coffee, including notes like fruity, nutty, chocolatey, etc. | Yes | A crucial sensory attribute for determining the taste profile and overall quality |
| Aftertaste | The lingering taste left after drinking the coffee. | Yes | Provides insights into the lingering taste, impacting the perception of coffee quality. |
| Acidity | The bright and tangy quality of the coffee, contributing to its liveliness. | Yes | A major component of coffee's flavor profile, affecting its brightness and liveliness. |



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| Body | The weight or thickness of the coffee on the palate, ranging from light to full. | Yes | Influences the mouthfeel of the coffee, an important sensory characteristic. |
| Balance | The overall harmony of the coffee's flavor, aroma, acidity, and body. | Yes | Represents the harmony of various sensory attributes, contributing to overall quality. |
| Uniformity | The consistency of the coffee's quality across different samples from the same batch. | Yes | Indicates consistency across samples, crucial for a reliable quality prediction. |
| Overall | A general rating of the coffee's quality by the grader. | No | Redundant attribute as it provides an aggregated quality score which we aim to predict using other sensory attributes. |
| Total Cup Points | he sum of scores for the various sensory attributes, giving an overall quality score. | No | This is the target variable that combines various sensory attributes into a single score. |
| Moisture Percentage | The moisture content of the coffee beans, expressed as a percentage | No | While important for storage and processing, it has less direct impact on sensory quality attributes. |



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| Category One Defect | Serious defects in the beans that significantly impact quality (e.g., black beans, sour beans). | Yes | Critical defects significantly impacting the coffee's quality and sensory attributes. |
| Quakers | Underripe or unroasted beans that are considered defects and can affect the flavor profile. | Yes | Defective beans that directly affect flavor and overall quality. |
| Color | The color of the coffee beans, which can indicate quality and processing method. | Yes | Can indicate quality and processing method, providing useful information for quality assessment. |
| Category Two Defects | Minor defects that have a lesser impact on the overall quality (e.g., broken beans, insect damage). | Yes | Minor defects that still contribute to the overall quality assessment. |