|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **Description** | **Selected (Yes/No)** | **Reasoning** |
| Area | Area of the bean | YES | Indicates size, important for both culinary and agricultural applications. |
| Perimeter | Perimeter of the bean | YES | Defines the boundary of the bean shape. |
| MajorAxisLength | Length of the major axis of the bean | YES | Provides key information about the shape and size of the bean. |

**Model Development Phase Template**

|  |  |
| --- | --- |
| Date | 15 July 2024 |
| Team ID | 739966 |
| Project Title | Beansense: Precision Bean Classification For Enhanced Agricultural And Culinary Applications |
| Maximum Marks | 5 Marks |

**Feature Selection Report Template**

For Precision Bean Classification, this report outlines the selected features crucial for accurate agricultural and culinary applications, ensuring optimal model performance and interpretability.



|  |  |  |  |
| --- | --- | --- | --- |
| Minor Axis Length | Length of the minor axis of the bean | YES | Complements MajorAxisLength in defining the shape of the bean. |
| Aspect Ration | Ratio of major axis length to minor axis length | YES | Describes elongation or compactness of the bean. |
| Eccentricity | Measure of how much the shape deviates from a perfect circle | YES | Indicates the elongation and irregularity of the bean shape. |
| Convex Area | Area of the smallest convex polygon that can contain the bean | NO | Not directly relevant for bean shape description in this context. |
| Equiv Diameter | Diameter of a circle with the same area as the bean | NO | Redundant with Area and Perimeter information. |
| Extent | Ratio of the area of the bean to the area of the bounding box | NO | Not critical for describing bean shape characteristics. |
| Solidity | Ratio of the area of the bean to its convex hull | NO | More relevant for shape analysis in other contexts. |
| roundness | Measure of how close the shape of the bean is to a circle | NO | Less relevant for non-spherical objects like beans. |
| Compactness | Measure of how compact the shape of the bean is | NO | Focuses on compactness, less critical for bean shape. |
| ShapeFactor 1 | Shape factor based on area and perimeter | NO | Specific to shape analysis, not directly useful for beans. |
| ShapeFactor 2 | Shape factor based on area and compactness | NO | Similar to ShapeFactor1, less relevant for beans. |
| ShapeFactor3 | Shape factor based on perimeter and compactness | NO | Provides additional shape characterization based on perimeter and compactness. |
| ShapeFactor4 | Shape factor based on area and eccentricity | YES | Adds further shape description based on area and eccentricity. |