

AutoML Final Report

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Generated: 2025-12-24 22:18:01

1. Dataset Overview

Original Dataset:

- Rows: 10000
- Columns: 7
- Missing Values: 0 (0.00%)
- Duplicate Rows: 246

Column Summary:

- Numeric Columns (3): size (cm), weight (g), avg_price (■)
- Categorical Columns (4): shape, color, taste, fruit_name

After Preprocessing:

- Rows: 9754
- Columns: 15
- Rows Removed: 246

2. EDA Findings

Numeric Features Statistics:

Feature	Mean	Median	Std	Min	Max
size (cm)	8.43	7.20	6.40	0.90	27.50
weight (g)	455.46	168.80	731.64	4.50	3299.80
avg_price (■)	77.02	75.40	38.95	9.00	165.00

3. Data Quality Issues Detected

Issues Summary:

- High Severity: 3
- Medium Severity: 3
- Low Severity: 0

Issues Detected:

- [MEDIUM] DUPLICATE_ROWS in 'Dataset': 246 (2.46%)
- [HIGH] OUTLIERS in 'size (cm)': 804 (8.04%)
- [HIGH] OUTLIERS in 'weight (g)': 2042 (20.42%)
- [MEDIUM] CLASS_IMBALANCE in 'shape': N/A (0.00%)
- [MEDIUM] CLASS_IMBALANCE in 'color': N/A (0.00%)
- [HIGH] CLASS_IMBALANCE in 'taste': N/A (0.00%)

4. Preprocessing Decisions

Methods Applied:

- Missing Values Strategy: Mean
- Outlier Handling: Remove
- Scaling Method: Standard
- Encoding Method: OneHot
- Test Size: 0.2

Impact Summary:

- Rows Removed: 246
- Missing Values Reduced: 0 → 0
- Features Modified: 15 (from 7)

5. Model Configurations & Hyperparameters

Training Configuration:

- Test Size: 0.2
- Random State: 42
- Hyperparameter Tuning: No

Models Trained: 7 total

Non-Tuned Models (7):

- Logistic Regression (default parameters)
- K-Neighbors Classifier (default parameters)

- Decision Tree Classifier (default parameters)
- Gaussian Naive Bayes (default parameters)
- Random Forest (default parameters)
- Support Vector Machine (default parameters)
- Decision Tree Rule-based (default parameters)

6. Model Performance Comparison

Model	Accuracy	Precision	Recall	F1-Score	Training Time
Logistic Regression	1.0000	1.0000	1.0000	1.0000	0.56s
K-Neighbors Classifier	1.0000	1.0000	1.0000	1.0000	0.05s
Decision Tree Classifier	1.0000	1.0000	1.0000	1.0000	0.04s
Gaussian Naive Bayes	1.0000	1.0000	1.0000	1.0000	0.03s
Random Forest	1.0000	1.0000	1.0000	1.0000	0.85s
Support Vector Machine	1.0000	1.0000	1.0000	1.0000	1.21s
Decision Tree Rule-based	0.5689	0.5219	0.5689	0.5265	0.04s

7. Best Model Summary & Justification

Selected Model: Logistic Regression

Reason: Best F1 score: 1.0000

Performance Metrics:

- Accuracy: 1.0
- Precision: 1.0
- Recall: 1.0
- F1-Score: 1.0
- ROC-AUC: 1.0
- Training Time: 0.5612533092498779s