



SAMSUNG PRODUCT LAUNCH



01 Business
Problem

02 Data
Analysis

03 Data
Modeling

04 Evaluation

01 Business Problem

Samsung wants to launch a new product in the market.





Business Problem Product Goal

HIGH-SPEC & AFFORDABLE

The new product will be designed to meet the High specification criteria as well as being affordable to the Samsung users community.

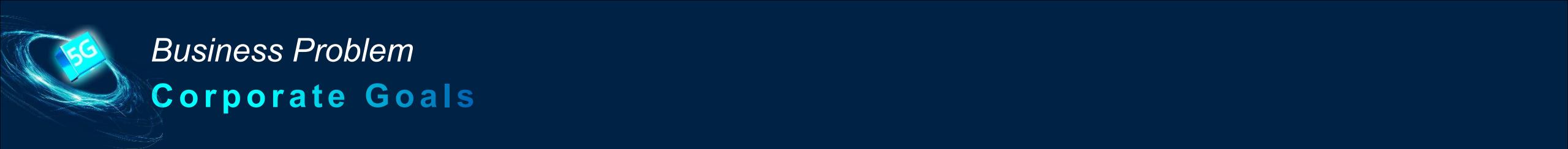


Affordable



High-Spec





Business Problem Corporate Goals

High Profit Margin

The Sales and Marketing Team wants to leverage this project's findings to tailor advertising campaigns, target specific customer segments, and highlight key features that will drive sales to its maximum.



Low Cost

The project aims to drive sales up by offering a high quality product at an affordable price. Samsung wants to know which features will cost less to produce and have a high profit margin as well as when sold.



Business Problem Stakeholders' Utility

Samsung Product Team

They can use the insights to enhance product features, prioritize improvements, and optimize marketing strategies.

Sales and Marketing Team

They can leverage the findings to tailor advertising campaigns, target specific customer segments, and highlight key features.

Consumers and Potential Buyers

They benefit indirectly from better products and informed purchasing decisions.



Business Problem Project Objectives

Main: Create a Product Classifier Model

Create a machine learning model that predicts a product specification rating based on its features.



Feature Selection and Exploration

Explore relationships between features and the specification and identify relevant features for model training.

Model Building and Evaluation

Develop, optimize and evaluate machine learning models:

- logistic regression
- decision trees
- random forests

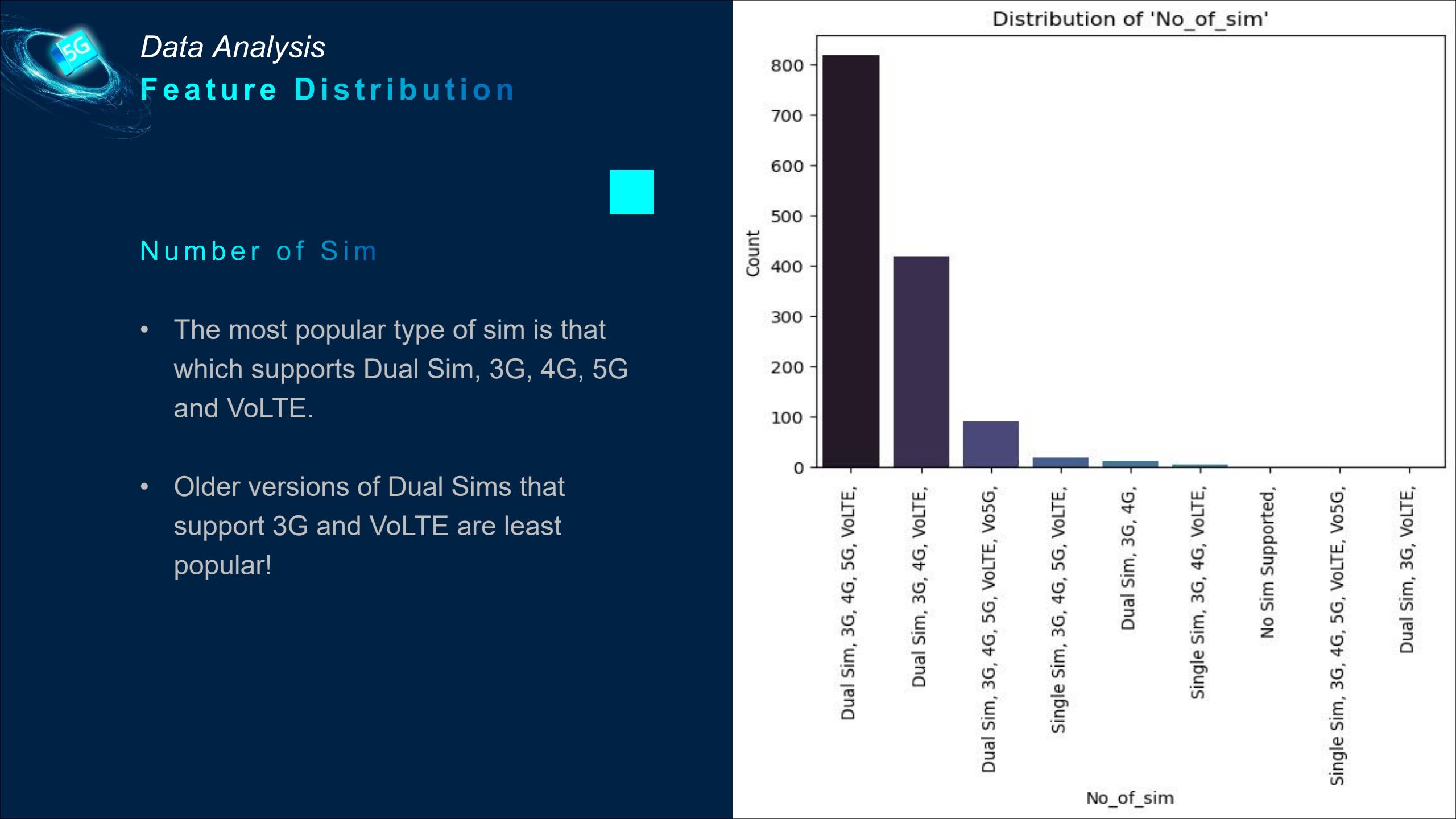
Interpretability and Insights

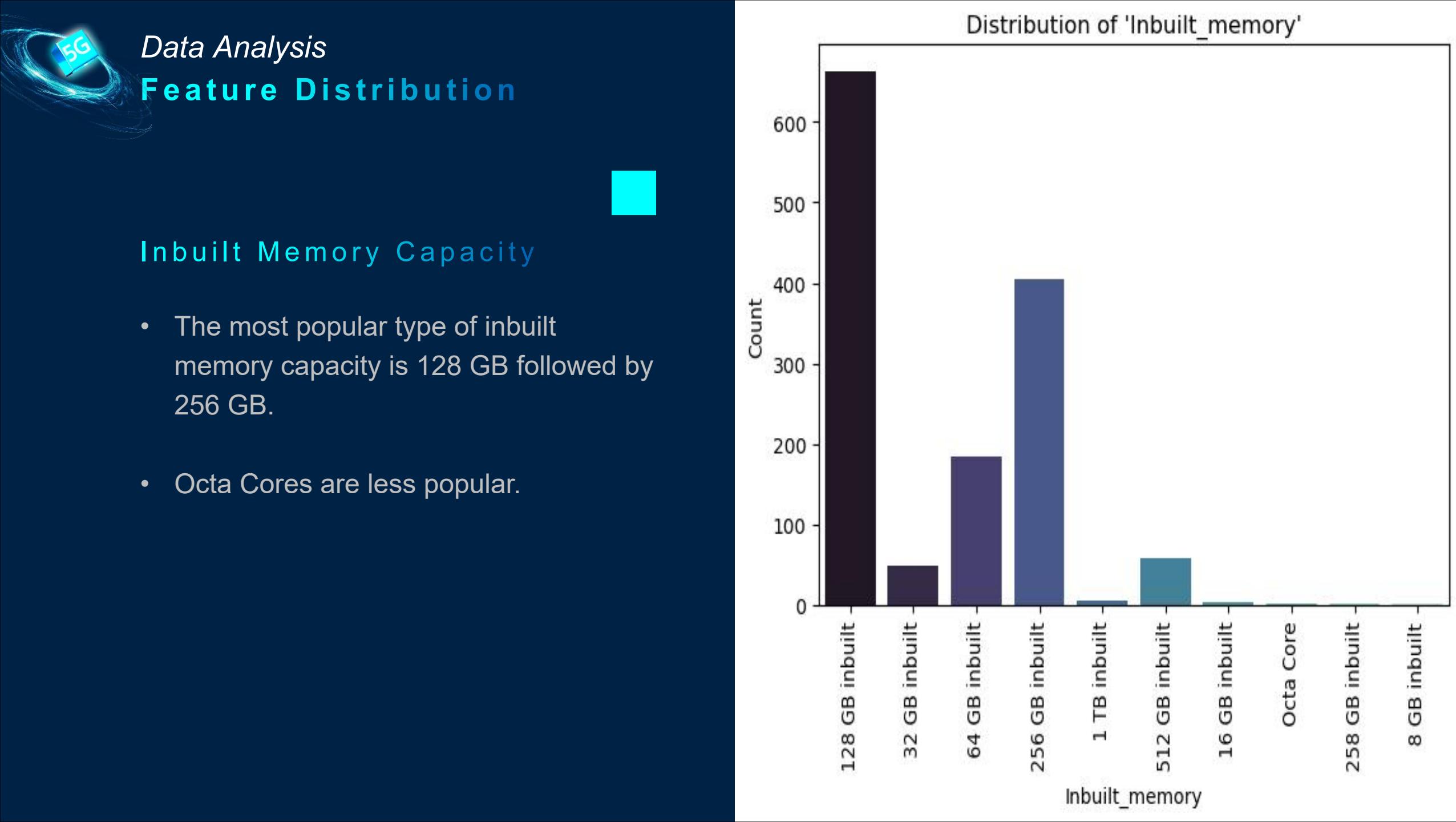
Interpret model results to understand feature importance and provide actionable insights for Samsung's product team.

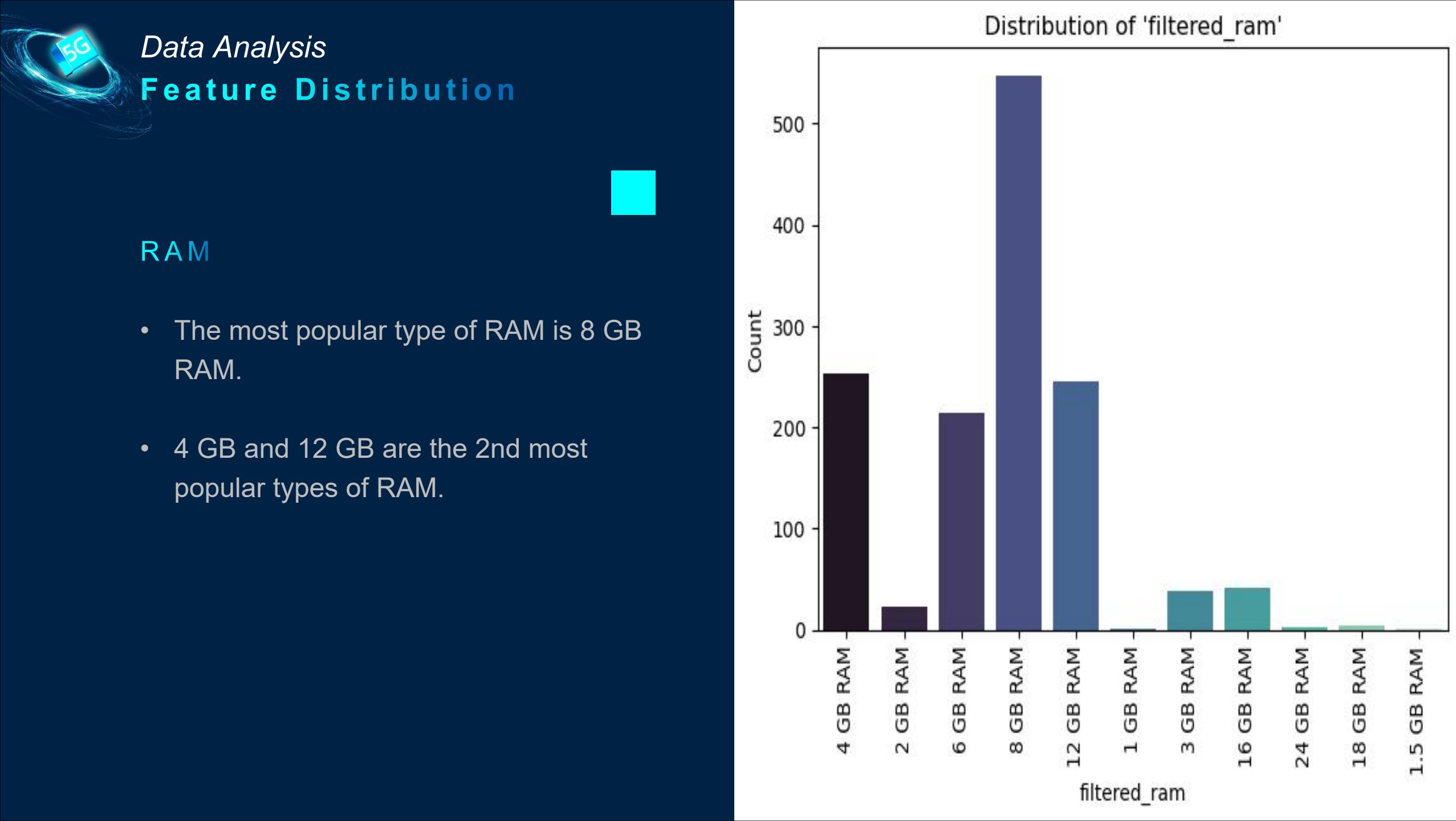
02 Data Analysis

Visualizing Data







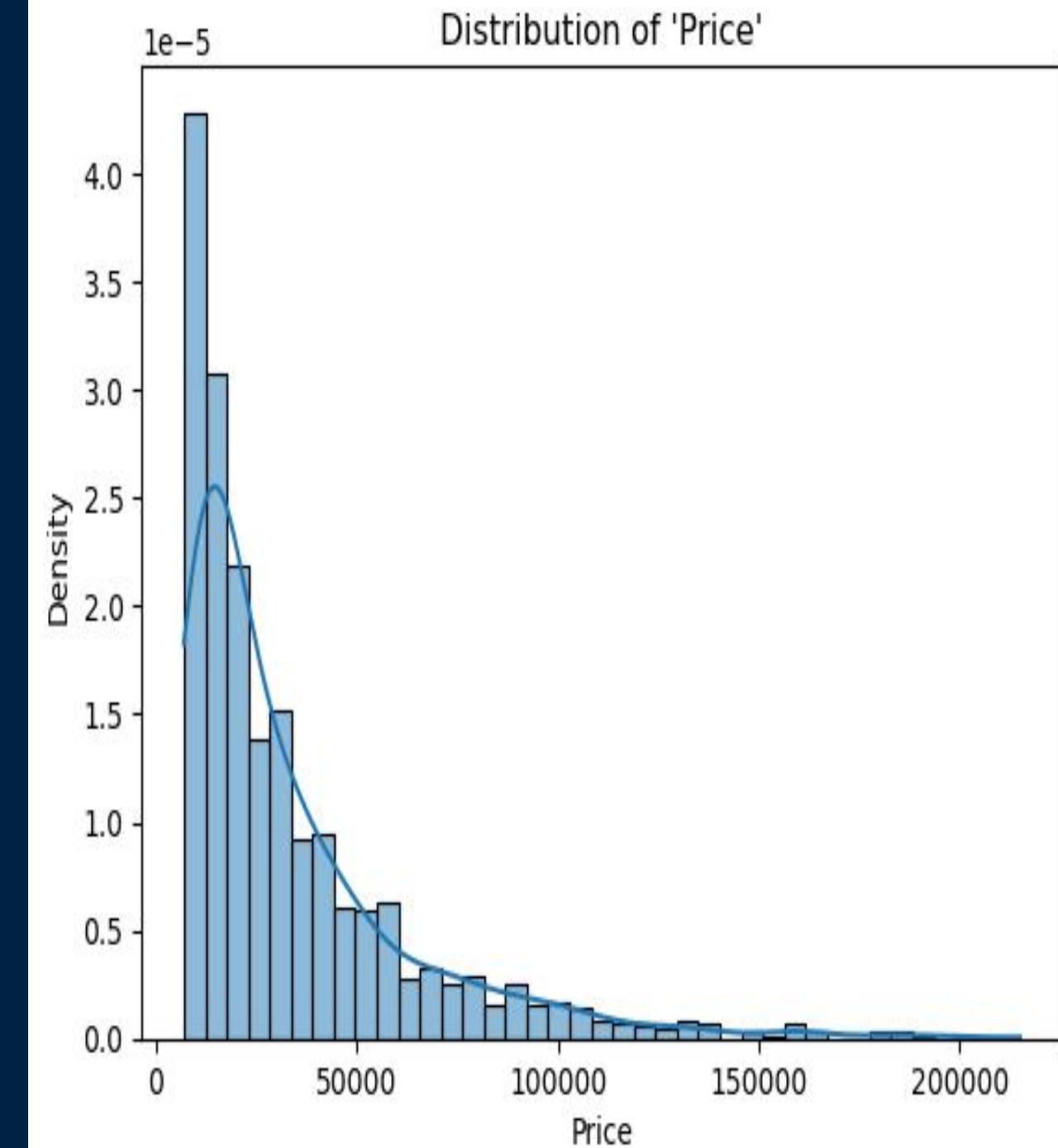


Data Analysis

Feature Distribution

Price Distribution

- The distribution of phone prices is concentrated on the lower end of the spectrum, with fewer people buying expensive phones.



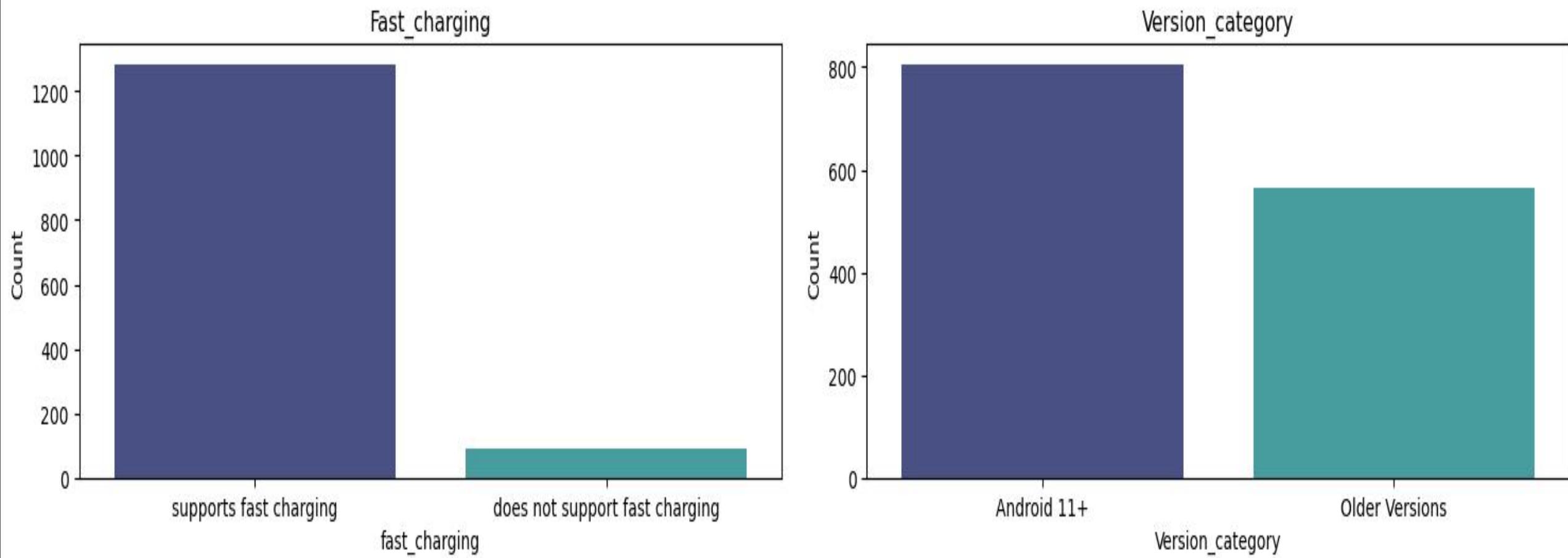


Data Analysis

Feature Distribution



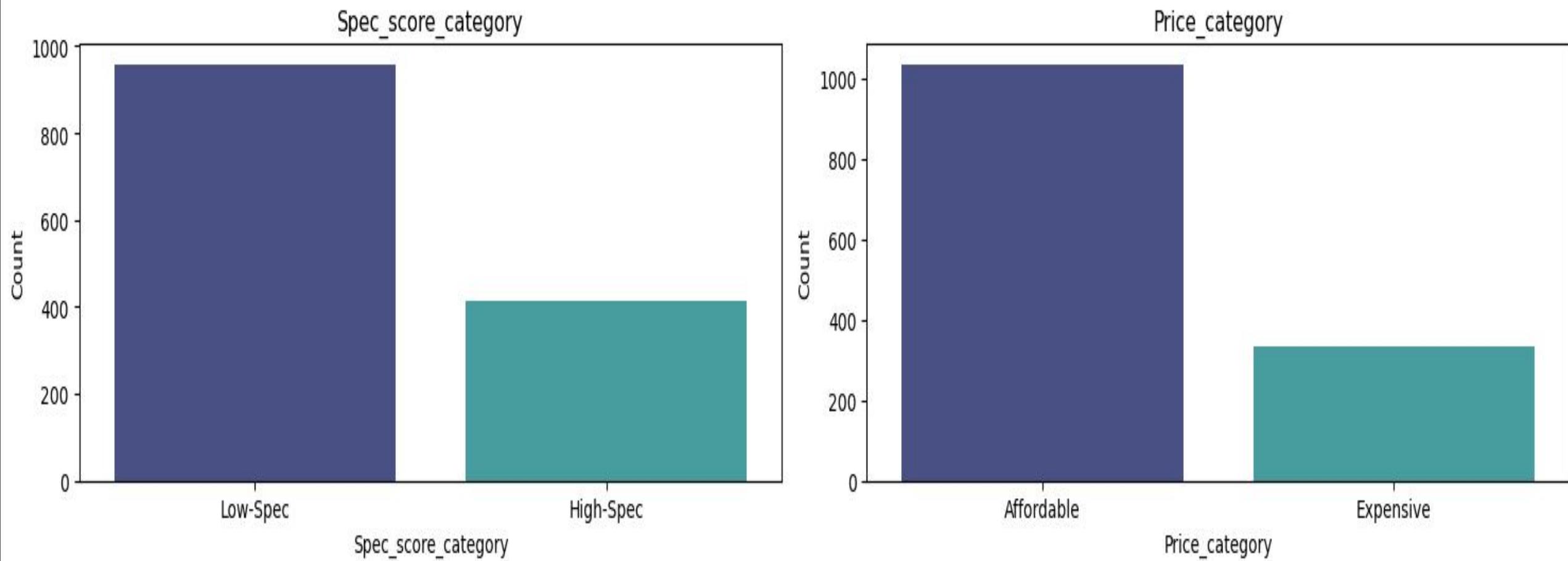
Other features Distribution







Other features Distribution



03 Data Modeling

- Base Model - Phone Specification Classifier
- Model 2 - Price Classifier





Data Modeling

Base Model - Phone Specification Classifier



Results before applying SMOTE

	Model	Accuracy	Recall	Precision	F1
0	LogisticRegression(random_state=42)	0.858881	0.625000	0.888889	0.733945
1	DecisionTreeClassifier(random_state=42)	0.844282	0.734375	0.758065	0.746032
2	RandomForestClassifier(random_state=42)	0.875912	0.742188	0.840708	0.788382
3	KNeighborsClassifier()	0.781022	0.539062	0.690000	0.605263



Results after applying SMOTE

	Model	Accuracy	Recall	Precision	F1
0	LogisticRegression(random_state=42)	0.824818	0.648438	0.754545	0.697479
1	DecisionTreeClassifier(random_state=42)	0.861314	0.734375	0.803419	0.767347
2	RandomForestClassifier(random_state=42)	0.883212	0.773438	0.838983	0.804878
3	KNeighborsClassifier()	0.785888	0.664062	0.653846	0.658915

Base Model - Phone Specification Classifier

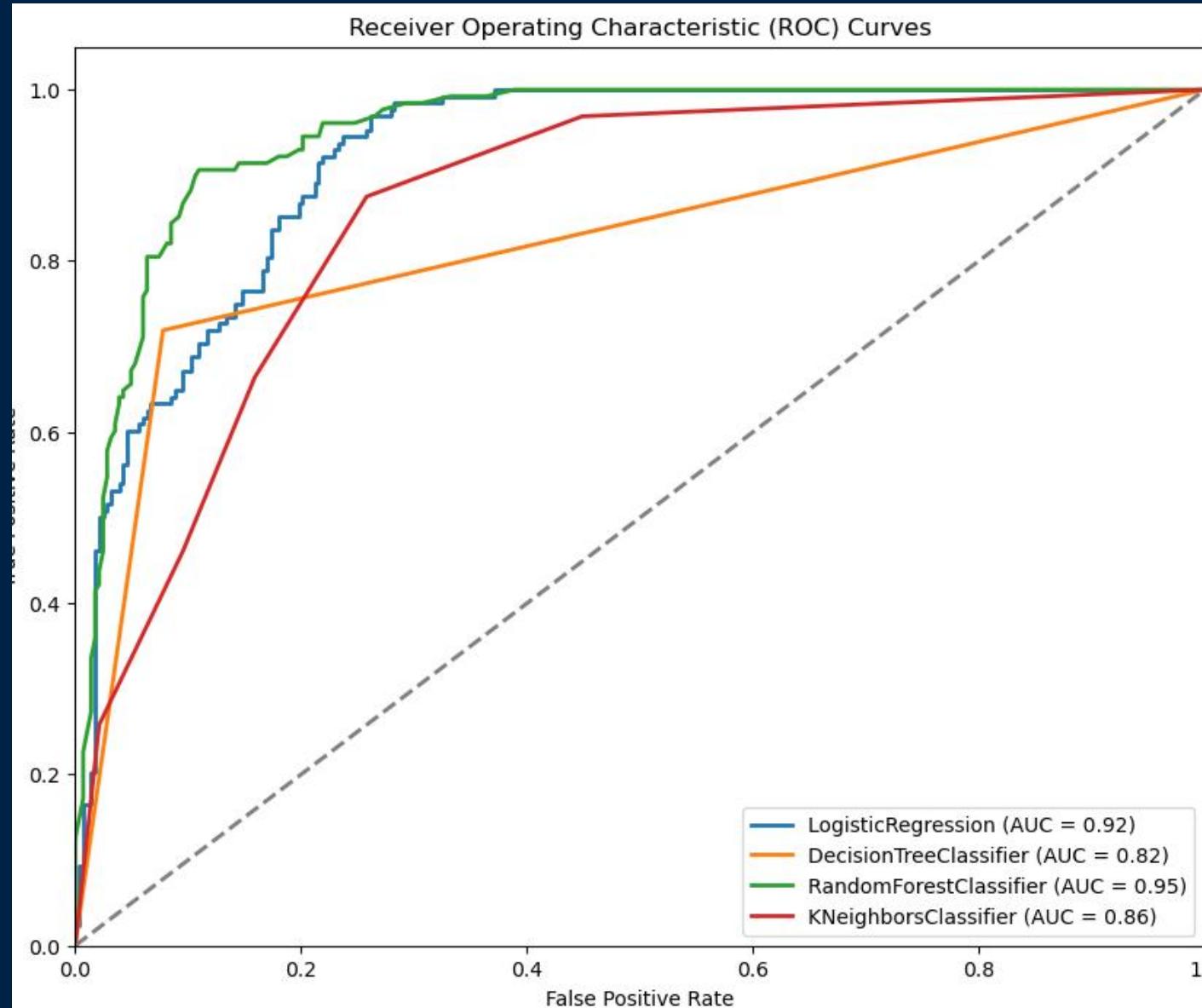
ROC Curve Visual

Logistic Regression:

- LR correctly predicts 82.48% of the phone specifications overall. It has a good balance between precision and recall.

Random Forest Classifier

- RFC achieves high accuracy and maintains good precision and recall. It's a strong performer.



Model 2 - Price Classifier

Model 2 Results

		Model	Accuracy	Recall	Precision	F1
0		LogisticRegression(random_state=42)	0.851582	0.854890	0.947552	0.898839
1		DecisionTreeClassifier(random_state=42)	0.883212	0.911672	0.935275	0.923323
2		RandomForestClassifier(random_state=42)	0.880779	0.905363	0.937908	0.921348
3		KNeighborsClassifier()	0.846715	0.867508	0.929054	0.897227

- DTC performs well with high accuracy and balanced precision and recall. It may be overfitting the data.
- RFC achieves high accuracy and maintains good precision and recall. It's a strong performer.

Model 2 - Price Classifier

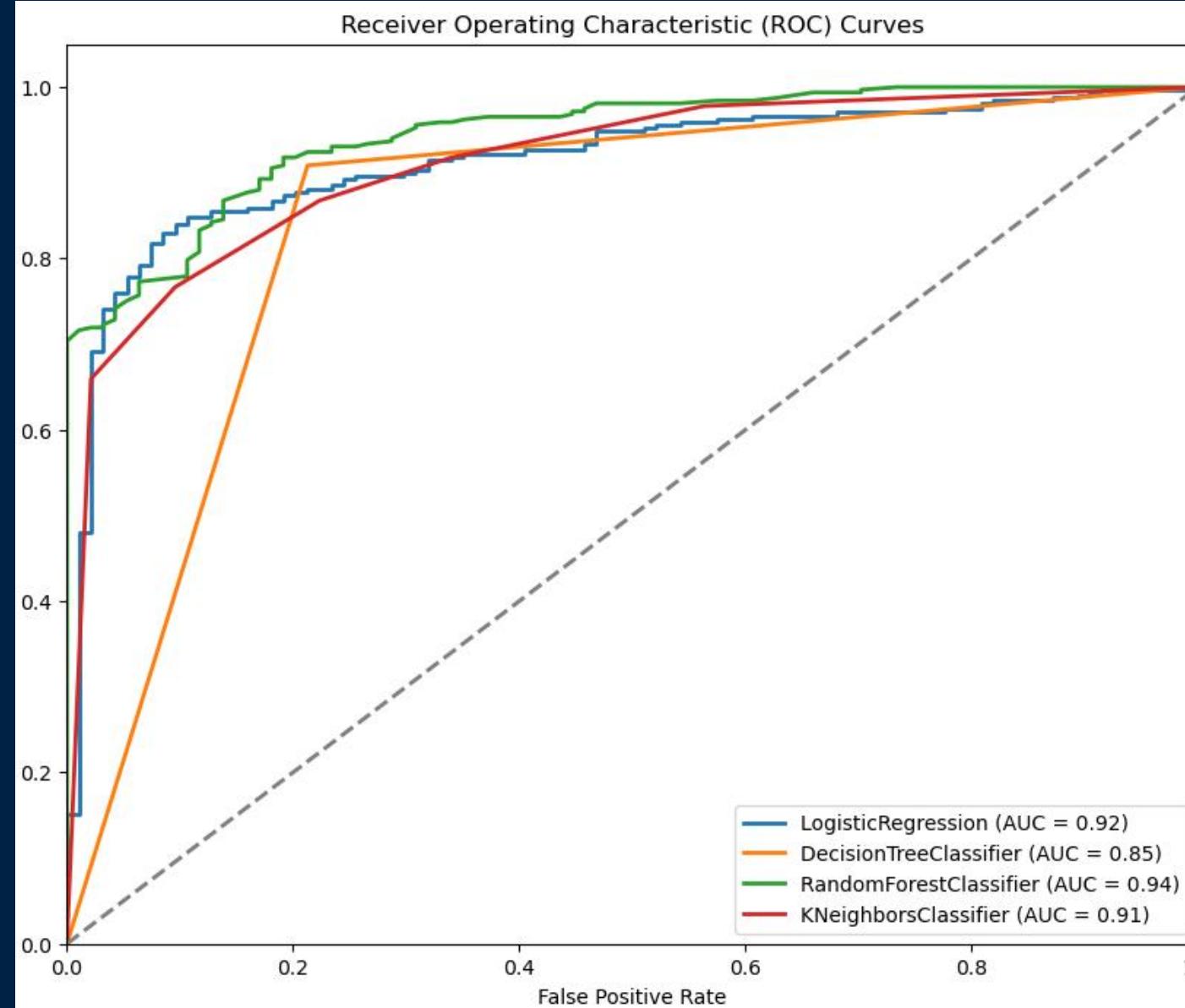
ROC Curve Visual

KNeighborsClassifier

- KNN performs adequately but has lower accuracy compared to other models.

RandomForestClassifier

- RFC achieves the highest accuracy



04 Evaluation & Recommendations

- Metrics Justification
- Final Model Recommendation
- Implications





Evaluation Metrics Justification

Accuracy

Measures overall correctness but may not be sensitive to class imbalances.



Recall

Important for identifying true positives (correctly predicting high-spec phones).

Precision

Relevant for minimizing false positives (not misclassifying low-spec phones as high-spec).

F1 Score

Balances precision and recall.

Final Model Recommendation

Decision Trees Classifier

- Considering the business context, the Decision Tree Classifier for both the Phone Specification Categorizer and Price Categorizer is the best pick.
- It achieves the highest accuracy and is interpretable.



By predicting whether a phone is high-spec or low-spec, Samsung can:

- Optimize marketing strategies for each category.
- Allocate resources effectively for the upcoming new product. 
- Enhance customer satisfaction by focusing on key features.



05 Recommendations





Recommendations

Highly Recommended Features

	Feature	Recommendation
0	Price	42K
1	RAM	8 GB & 12 GB
2	Processor	Octa Core
3	Inbuilt Memory	128 GB or 256 GB
4	Display Size	6.1 - 6.5 inches
5	Battery Capacity	5000 mAh

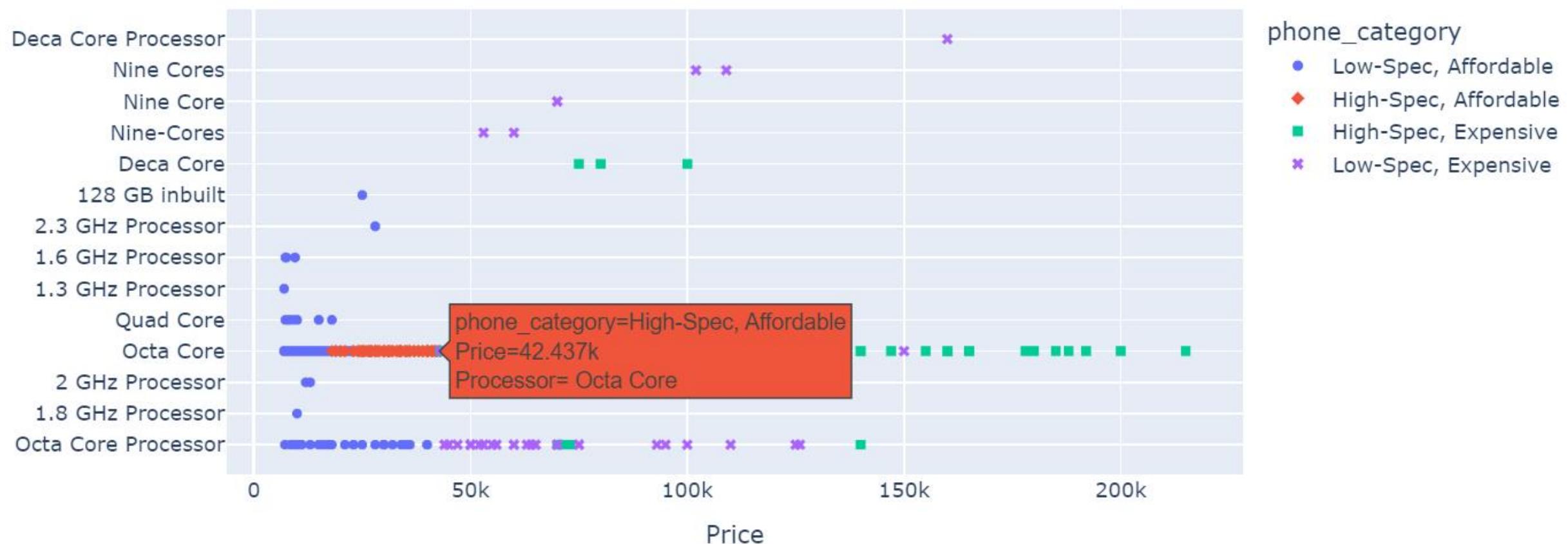


Recommendations

Highly Recommended Features - Octa Core Processor



Phone Price and Processor Recommendation





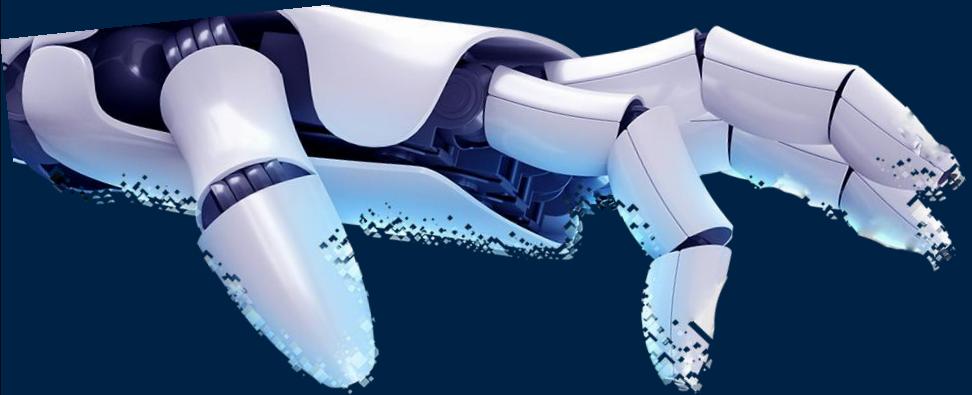
Recommendations

Highly Recommended Features - RAM [8 GB, 12 GB]



Phone Price and RAM Recommendation





End Quote

“Technology gives us power, but it does not and cannot tell us how use that power.

Thanks to technology, we can instantly communicate across the world, but it still doesn't help us know what to say.”

- Steve Jobs

Thank you

By: Bradley Ouko