Optimizing Customer Purchasing Patterns

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Project Overview

✓ Objective: Improve the accuracy of customer income level and purchasing pattern estimation to enable more targeted marketing strategies.

✓ Challenge: Existing models for estimating customer income levels and purchasing patterns were inaccurate, leading to suboptimal marketing strategies.

✓ Expected Outcomes:

- Enhanced accuracy in estimating customer income and purchasing patterns.
- Improved ability to target marketing efforts effectively.
- Increased customer engagement and conversion rates through personalized marketing strategies.

Project Overview

✓ Data Collection: Aggregated data from CRM and sales databases.

✓ Data Cleaning: Removed duplicates and handled missing values to ensure data integrity.

✓ Feature Engineering: Created new features such as average purchase frequency and total spend.

✓ Clustering: Used K Means Clustering to segment customers based on income and purchasing patterns.

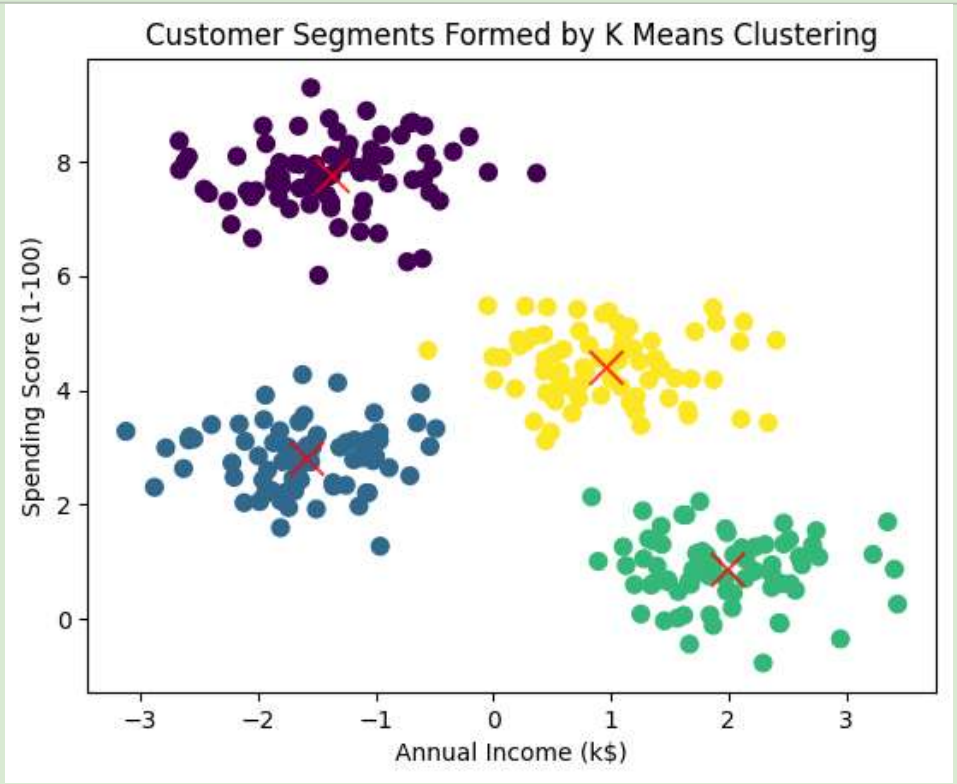
✓ Predictive Modeling: Developed and validated models to forecast future customer behaviors.

Clustering Methodology

✓ Algorithm: K Means Clustering

✓ Steps:

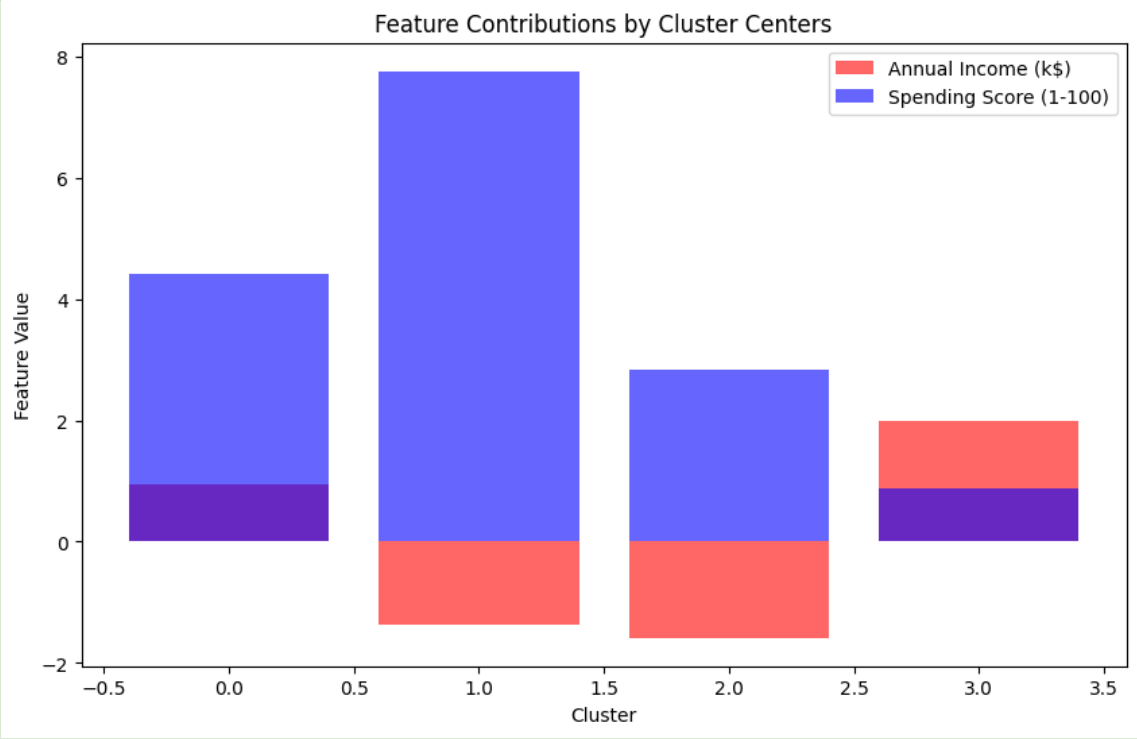
- Standardized the data
- Applied the Elbow Method to determine optimal clusters
- Executed K Means Clustering



Cluster Centers Analysis

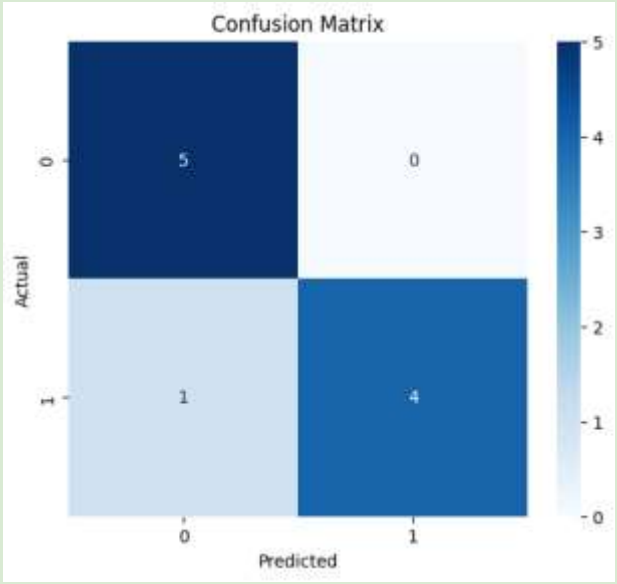
✓ Analysis:

- Examined cluster centers to understand feature contributions
- Visualized the importance of features like annual income and spending score in forming clusters

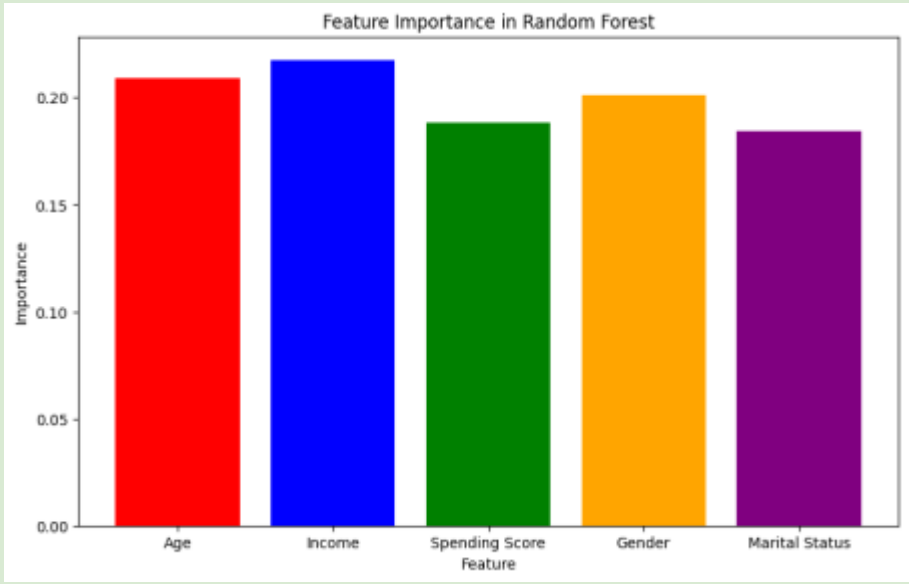


Predictive Modeling

- ✓ Model: Logistic Regression
- ✓ Purpose: Predict customer responses to marketing campaigns
- ✓ Accuracy: Demonstrated through confusion matrix

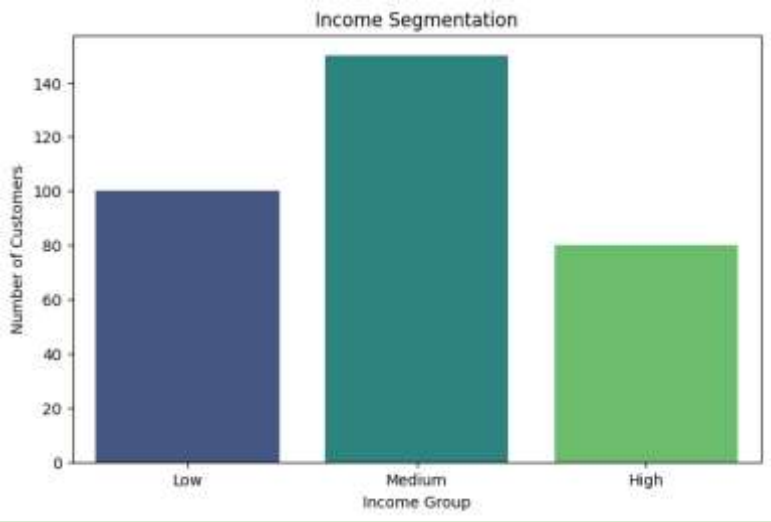


- ✓ Model: Random Forest
- ✓ Purpose: Identify key features influencing predictions



Visualizations

Visualization: Displayed distinct customer segments based on income



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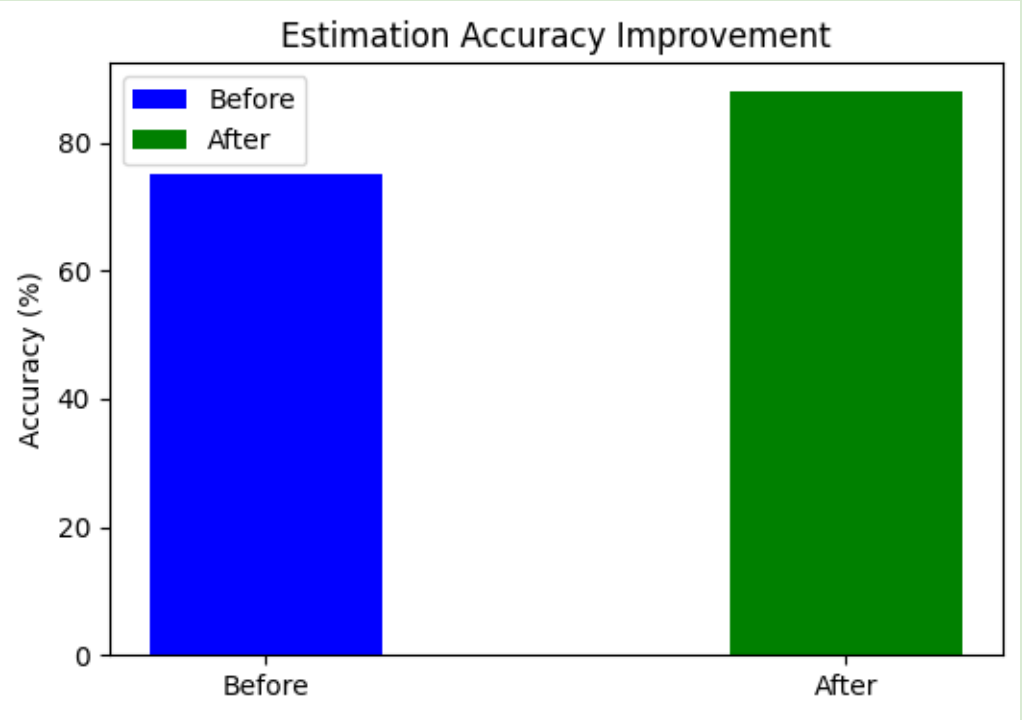
Business Impact

- ✓ Before and After Comparison: Showed improvement from 75% to 88% accuracy
- ✓ Impact: Enabled precise and effective marketing campaigns and personalized strategies



Technical Details and Challenges

Challenges:

- ✓ Ensuring data accuracy and completeness
- ✓ Improving model performance through feature engineering and parameter tuning

Solutions:

- ✓ Implemented robust data preprocessing techniques
- ✓ Utilized advanced model tuning methods