Amazon Sales Report - Predicting Cancellations

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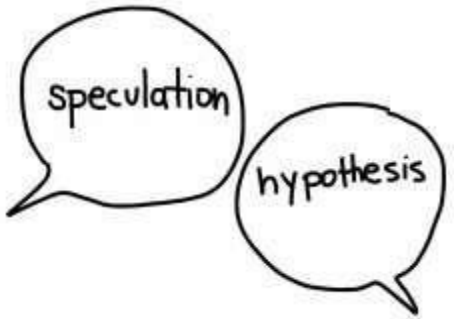
Objective



Problem statement -

Predicting cancellations in advance so that high risk of cancellation can be incorporated in pricing of the product

Research question -

What factors contribute most significantly to order cancellations?

Hypothesis -

Null Hypothesis (H0):-Independent variables (size, category, promotion id's , amount) does not affect the order cancellation rate.

Alternate Hypothesis (H1): At Least one of them effect cancellation rate

Market and industry context

Industry background -

The industry context for predicting order cancellations is crucial, especially if you are dealing with e-commerce, retail, or logistics

Current trends in Business analytics

Predictive modeling

Operational efficiency

Literature review

Key findings -

Order cancellations based on promotion id's , fulfillment, category, size and price

Methodology

Data collection - Source – Kaggle

Data cleaning - Removed blank spaces and missing values and removed unwanted variables

AI model - Logistic regression

Validation technique - Split validation

Used AI studio for prediction , BI and excel for visualization

PerformanceVector (Performance) | Logistic Regression Model (Logistic Regression)

on error

Table View | Plot View

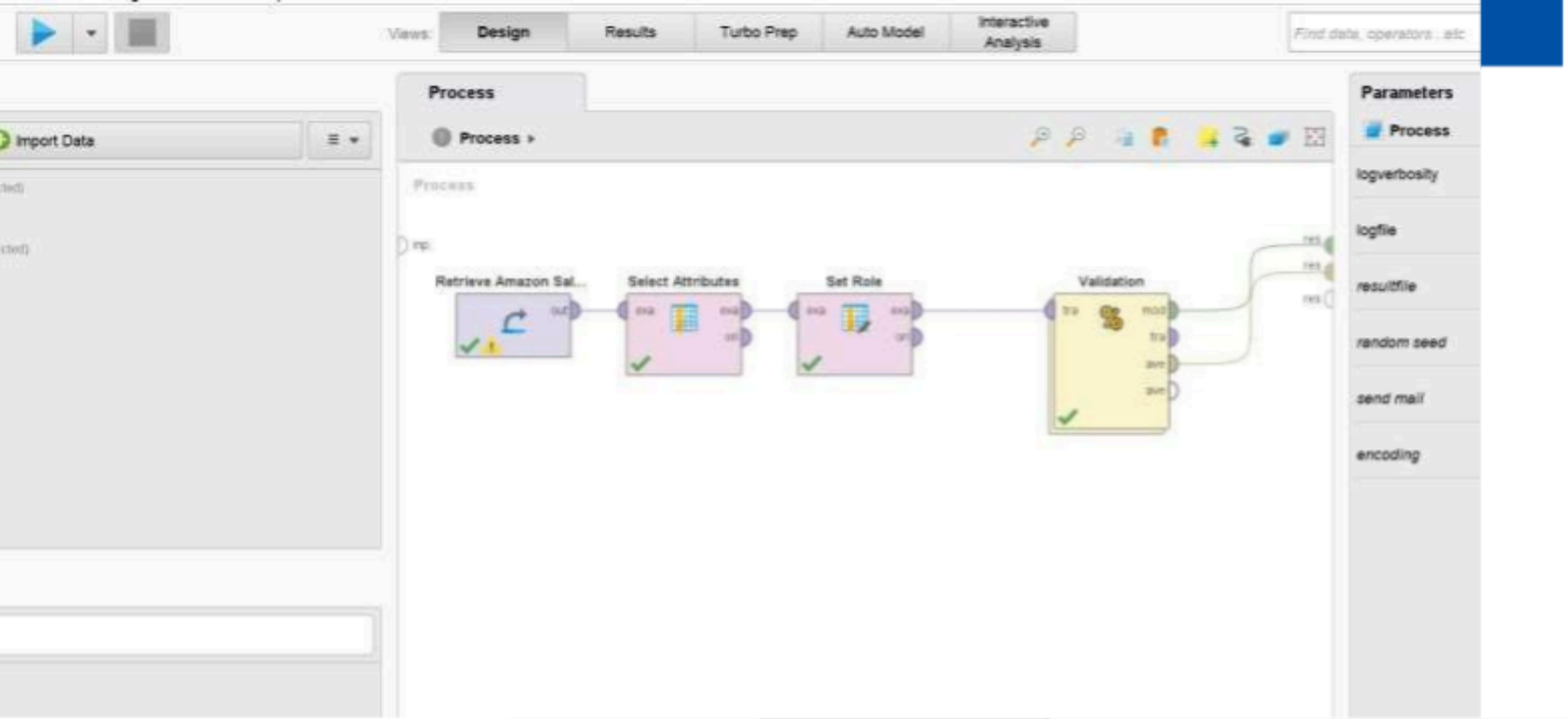
accuracy:

	true Cancelled	true Shipped	class precision
pred. Cancelled	5491	88	98.42%
pred. Shipped	9	33105	99.97%
class recall	99.84%	99.73%	

```
Accuracy: 0.8216649694501018
Classification Report:
              precision    recall  f1-score   support

           0       0.82      1.00      0.90      6455
           1       0.00      0.00      0.00      1401

    accuracy                           0.82      7856
   macro avg       0.41      0.50      0.45      7856
weighted avg       0.68      0.82      0.74      7856
```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Results
Turbo Prep
Auto Model
Interactive Analysis
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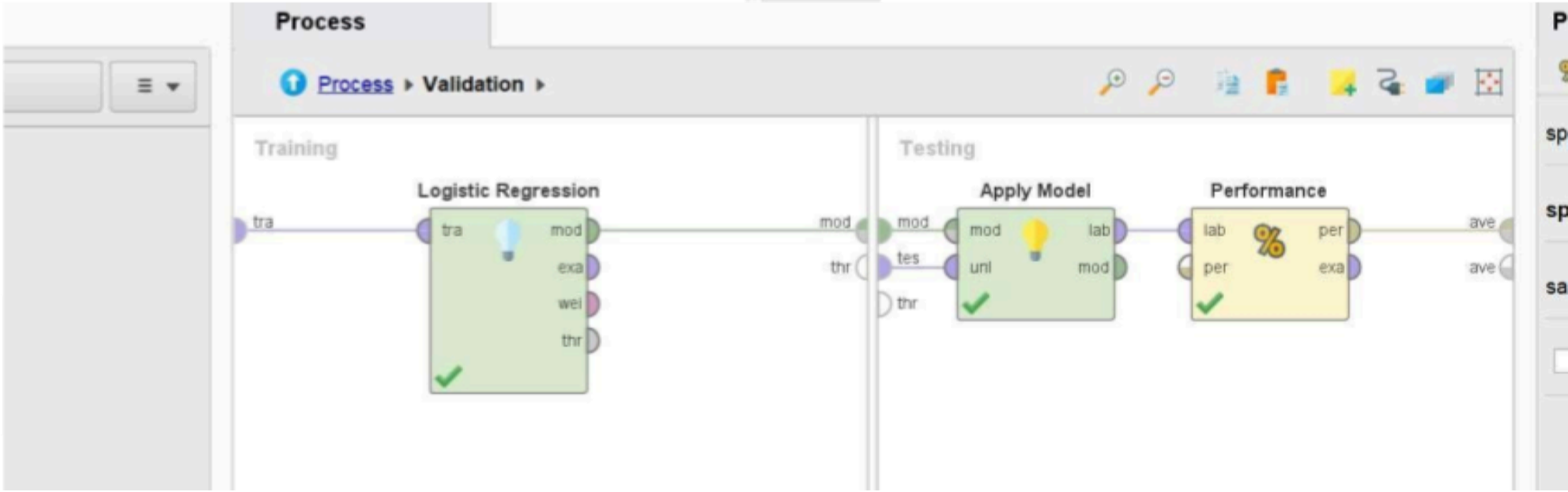
Retrieve Amazon Sal...
Select Attributes
Set Role
Validation
Parameters
Process
logverbosity
logfile
resultfile
random seed
send mail
encoding

AI studio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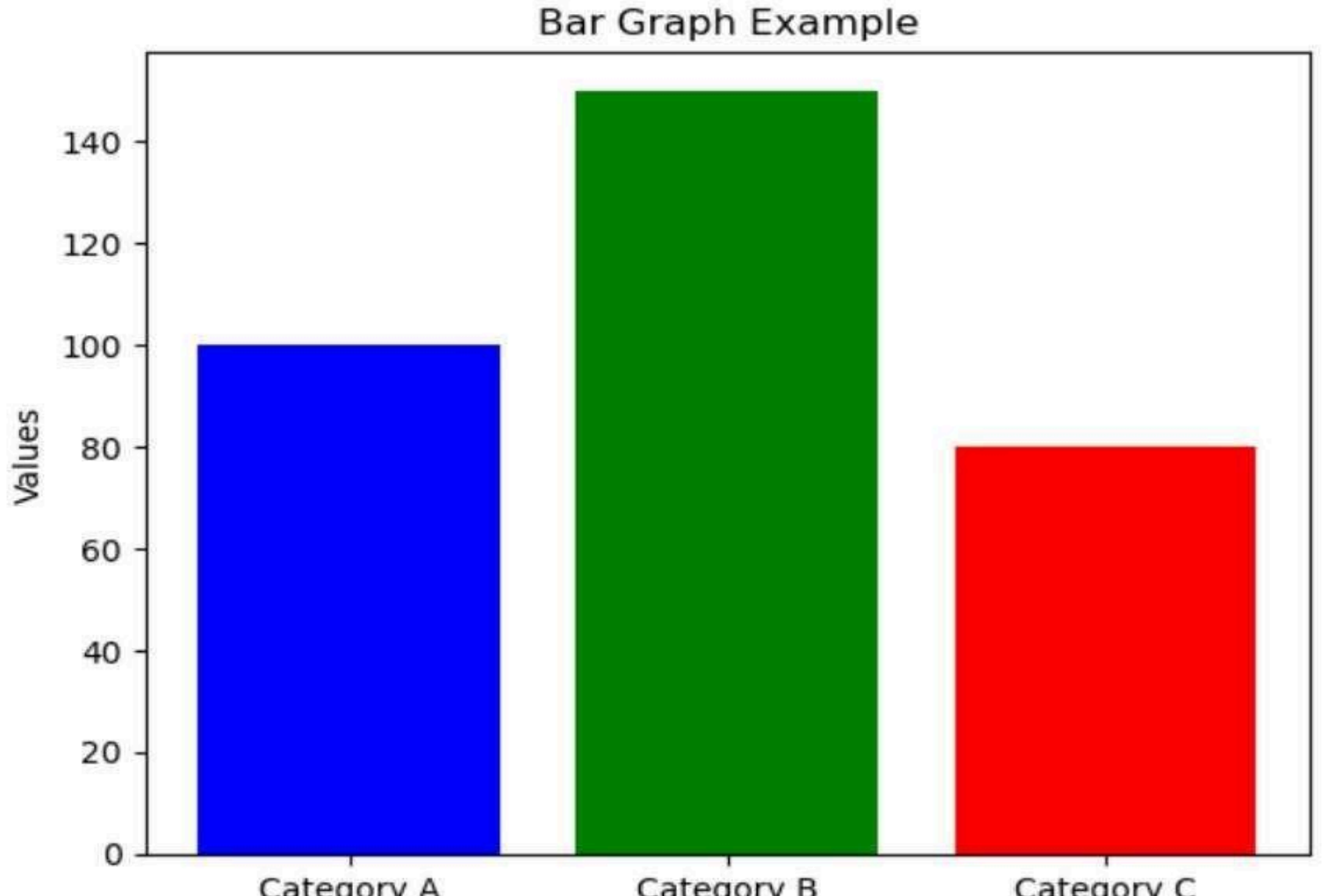
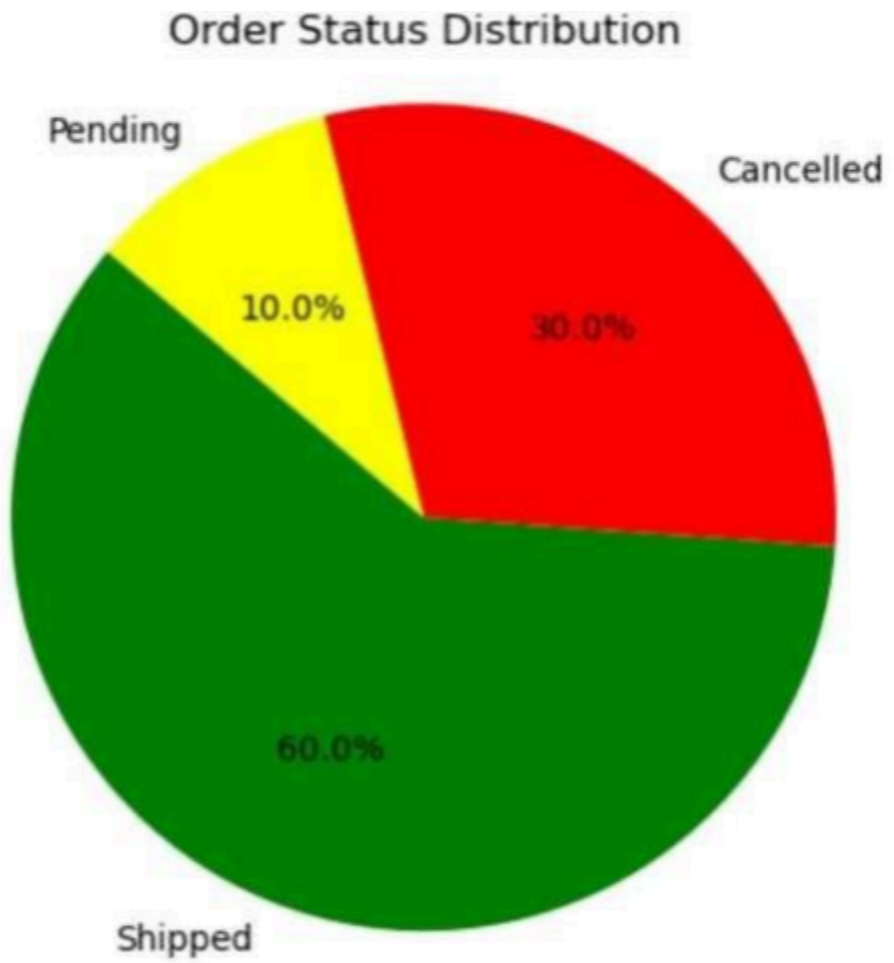
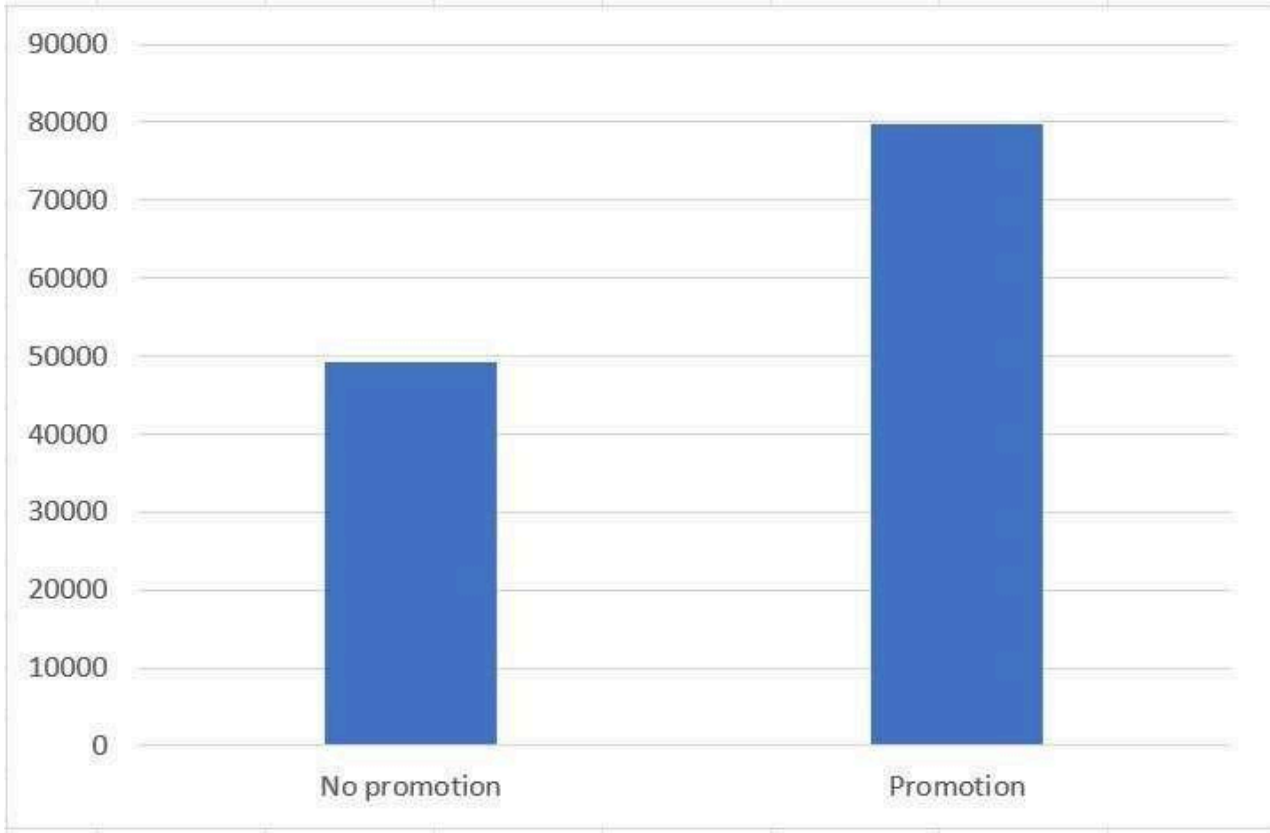
Visualizations

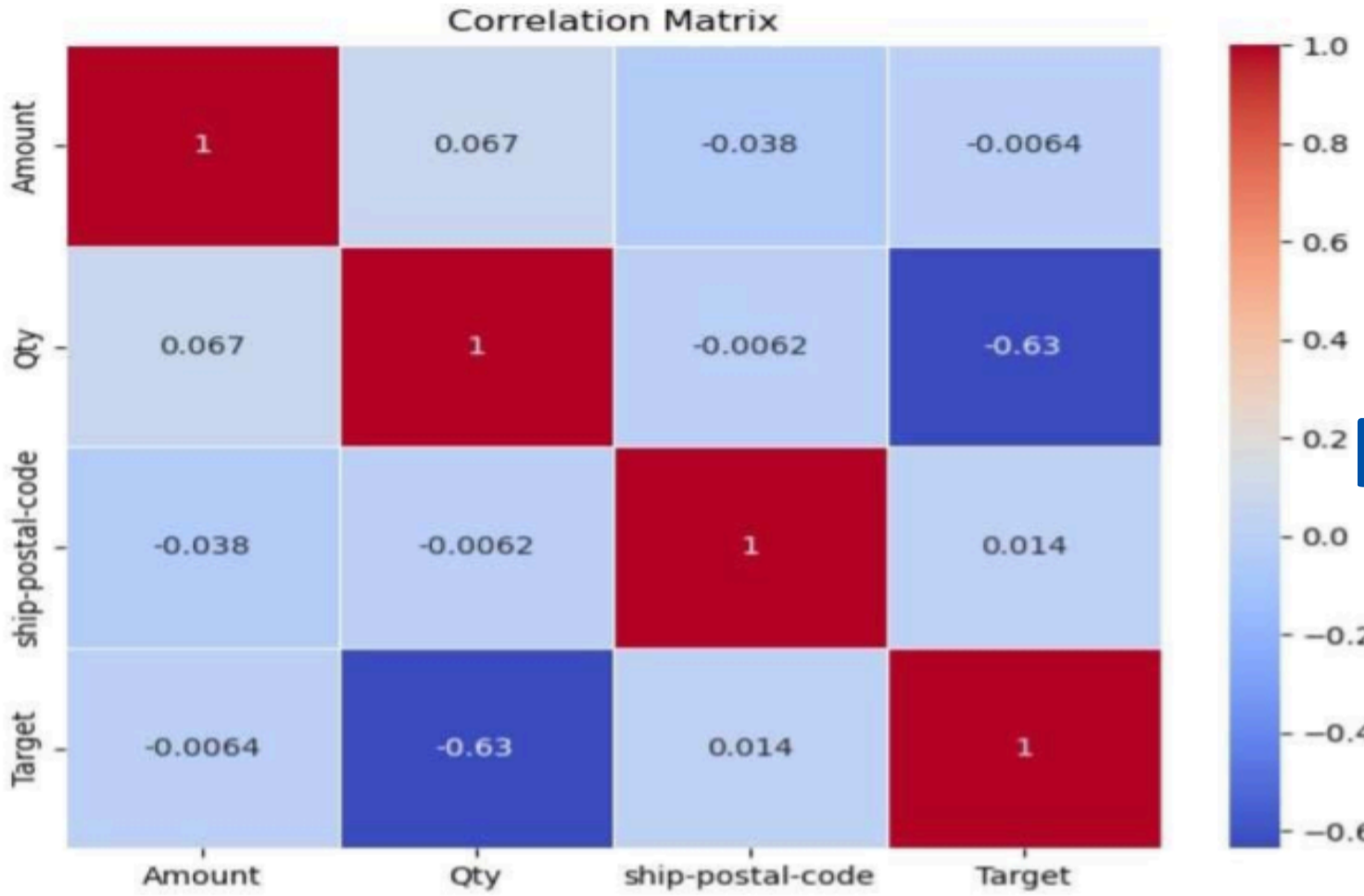


Visualizations





Correlation Analysis



Correlation Matrix:

	Amount	Qty	ship-postal-code	Target
Amount	1.000000	0.066820	-0.038195	-0.006401
Qty	0.066820	1.000000	-0.006157	-0.634904
ship-postal-code	-0.038195	-0.006157	1.000000	0.013871
Target	-0.006401	-0.634904	0.013871	1.000000

Regression Analysis:

	Feature	Coefficient
0	Amount	3.622917e-05
1	Qty	-8.418095e-01
2	ship-postal-code	1.885431e-08
Intercept	Intercept	8.661906e-01
Mean Squared Error	MSE	4.614133e-02
R-squared	R-squared	4.387695e-01

Challenges and Solutions

Interpretability of Predictions

- **Challenge:** Making the predictions understandable and actionable for merchants who may not have a technical background.
- **Solution:** Develop user-friendly dashboards and visualization tools that present the predictions and associated recommendations clearly.

Integration with Existing Systems

- **Challenge:** Seamlessly integrating predictive analytics into existing e-commerce platforms and workflows.
- **Solution:** Ensure compatibility with common e-commerce platforms like Amazon's seller central.

Implementation

Our analysis is useful for merchants who are selling products in e commerce platform amazon as it would help them in pricing the products

Best model and conclusion

- Regression, Correlation Analysis was the best model for prediction because the error rate and standard deviation is low with best accuracy

Future work

- Investigate using deep learning techniques
- Analyze customer behavior
- Cost sensitive learning

Thank

you