Erica’s Laundry Sales Project

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Note: sales data shared here is with approval of Erica’s Laundry’s owner

Introduction

-**Erica's Laundry** tasked me to create segmented customer contact lists for marketing promotions

  -Loyal customers
  -Active customers
  -No purchase in 6 months, etc.

-Took the opportunity to create **customer retention** predictive model to identify **high risk customers**

-Dashboard visualization to explore trends and seasonality for **drop off** and **delivery** service performance

Note: for confidentiality purposes, the first portion of this project cannot be shared, and any identifying information was removed

Erica’s Laundry

-Erica’s Laundry is a local, full-service laundromat located in the San Fernando Valley

-Offering Self Service, Fluff and Fold, Pickup and Delivery, and Commercial Laundry Services

-Utilize “Ozone” water system, a superior cleaning, eco friendly, and better sanitizing approach

Project Purpose

Identify customer segments to employ targeted retention strategies and promotions

Leverage machine learning algorithms to predict retention and high risks customers

Visualize key performance metrics and company sale trends to project future growth

Data Cleaning, Merging, and Filtering

-"**Drop Off**" and "**Delivery**" monthly sales data (2022 through March 2024)

-Data had duplicate customer names and phone numbers

-Cleaned string discrepancies and assigned contact information based on account creation date

-Merged all years together to make one cohesive data frame for analysis

-Reference to cleaned customer data to form final contact lists

For predictive model:

-Filtered out customers with <3 purchases overall

-Filtered out customers whose last purchase was before 6/2022

Note: necessary for lag variables calculation, and such customers are not relevant to the company.

Variable Formulation

-**Customer Retention: 1**-customers who **have made a purchase** in the last 3 months, **0**-customers who **have not** made a purchase

-**Average Monthly Revenue:** mean sales amount across months as an active customer

-**Months with Purchases:** count of (active) months where customers made a purchase

-**Gap Frequency:** count of gaps (no purchase months) between customer purchases

-**Lag Variables 1-6:** percentage change of sales amount compared to previous month sales

- -From last/most recent purchase to 6 months prior
- -Ex: Last Purchase in March -> Lag 1 compares March sales to February -> Lag 2 compares February to January, etc.

-Explored **seasonal join** variables but were insignificant

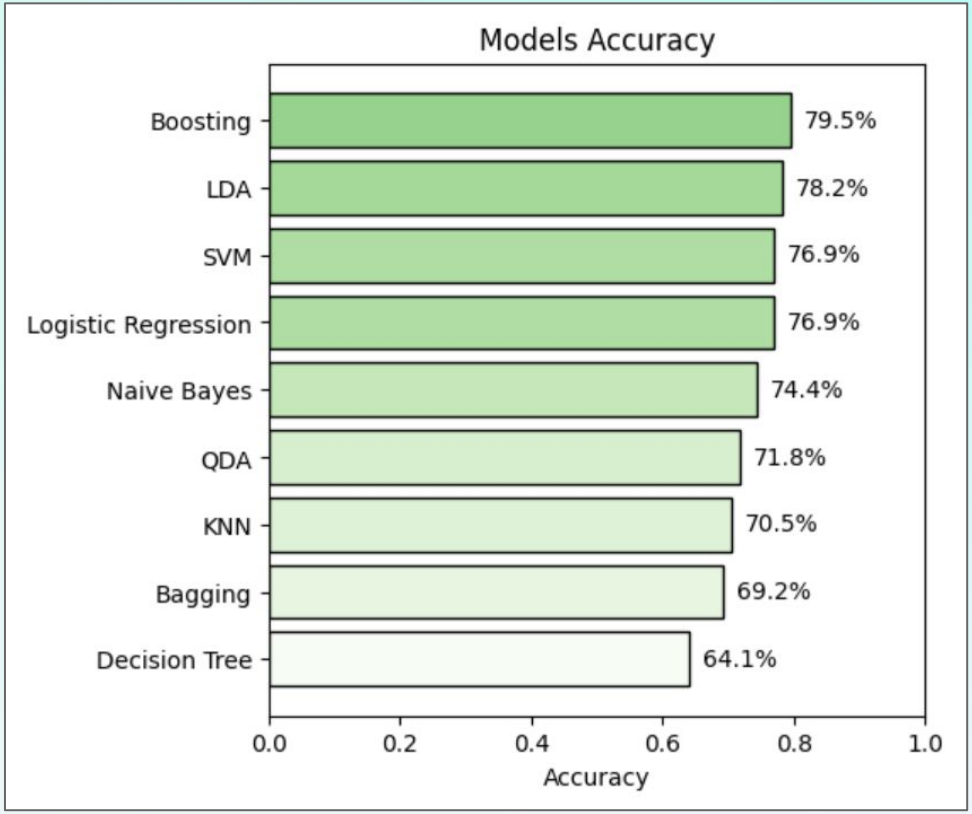
Note: limited data minimized options, the created variables tried to capture customer sales trends

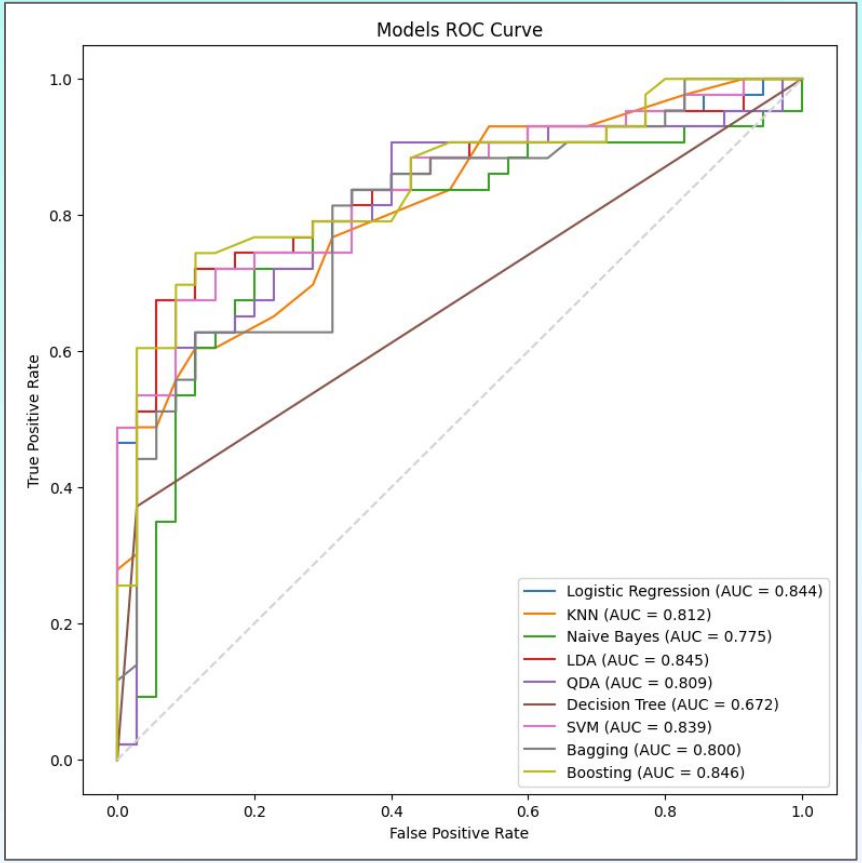
Model Testing

-Tested varied machine learning algorithms with unique statistical assumptions, used multitude of metrics to assess models performance

Model	Accuracy	Error	CV Score	Precision	Recall	F1	AUC Score
Logistic Regression	0.769	0.231	0.664	0.879	0.674	0.763	0.844
KNN	0.705	0.295	0.397	0.955	0.488	0.646	0.812
Naive Bayes	0.744	0.256	0.713	0.829	0.674	0.744	0.775
LDA	0.782	0.218	0.690	0.906	0.674	0.773	0.845
QDA	0.718	0.282	0.676	0.800	0.651	0.718	0.809
Decision Tree	0.641	0.359	0.667	0.941	0.372	0.533	0.672
SVM	0.769	0.231	0.664	0.879	0.674	0.763	0.839
Bagging	0.692	0.308	0.639	0.732	0.698	0.714	0.800
Boosting	0.795	0.205	0.029	0.886	0.721	0.795	0.846

Models Metric Visualizations





Model Selection

-Selected **Linear Discriminant Analysis** (LDA) for customer retention predictive model

-High accuracy, F1, and AUC score, with significant **cross validation**, placing it as a practical and reliable model

-Used model to identify **high risk customers** (customers who made a purchase in last 3 months but model predicted they wouldn't)

-Created additional customer segment contact list to target with **retention strategies**

Customer	Retain	Prediction	Probability
257	1	0	0.124596
220	1	0	0.127660
219	1	0	0.149615
255	1	0	0.151064
247	1	0	0.160193
227	1	0	0.165236
36	1	0	0.165499
239	1	0	0.169828
234	1	0	0.178316
222	1	0	0.179332
214	1	0	0.188607
226	1	0	0.195773
243	1	0	0.201939
240	1	0	0.204688
251	1	0	0.211919
244	1	0	0.233965
235	1	0	0.235331
253	1	0	0.239738

Note: this model is for drop off only, delivery did not have enough data to create relevant model

Dashboard Creation

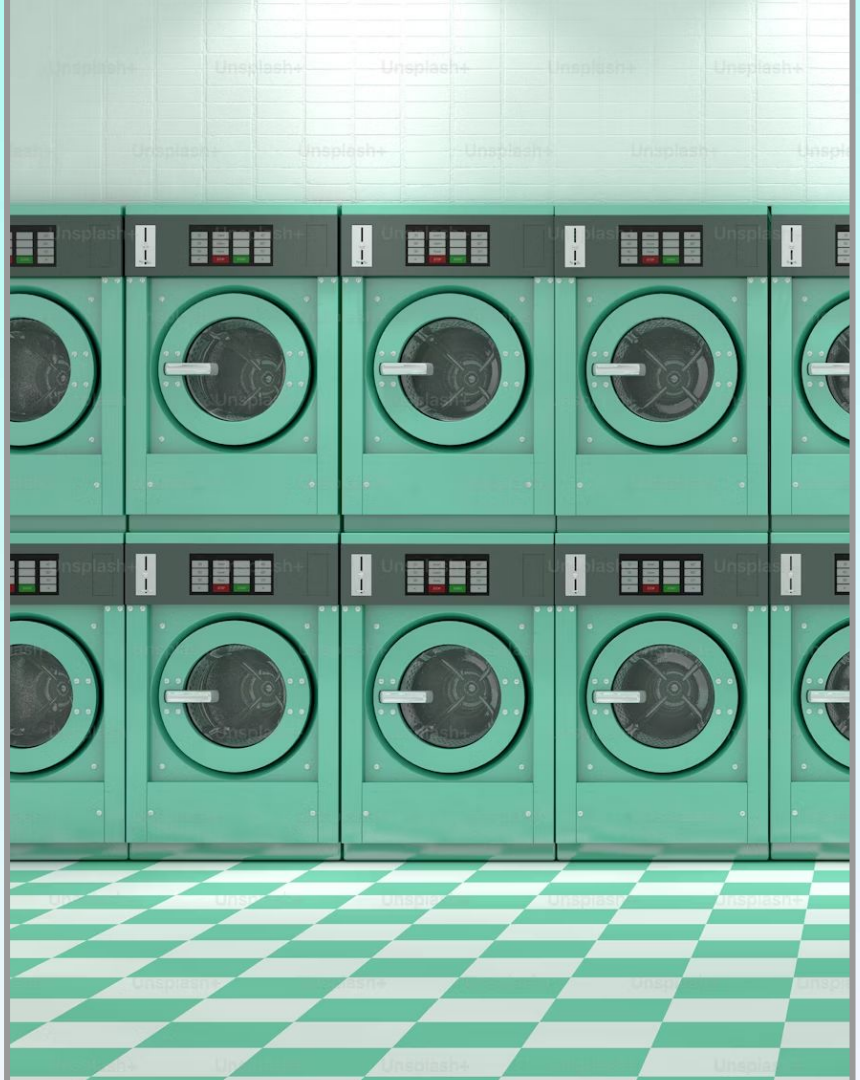
-Utilized Tableau for data visualization and performance dashboard

-Used combined drop off, delivery, and retention model variables data

-Focused financial performance comparison of drop off and delivery

-Forecast trends for coming year sales

-Highlight top interest customers



Erica's Laundry Performance Dashboard

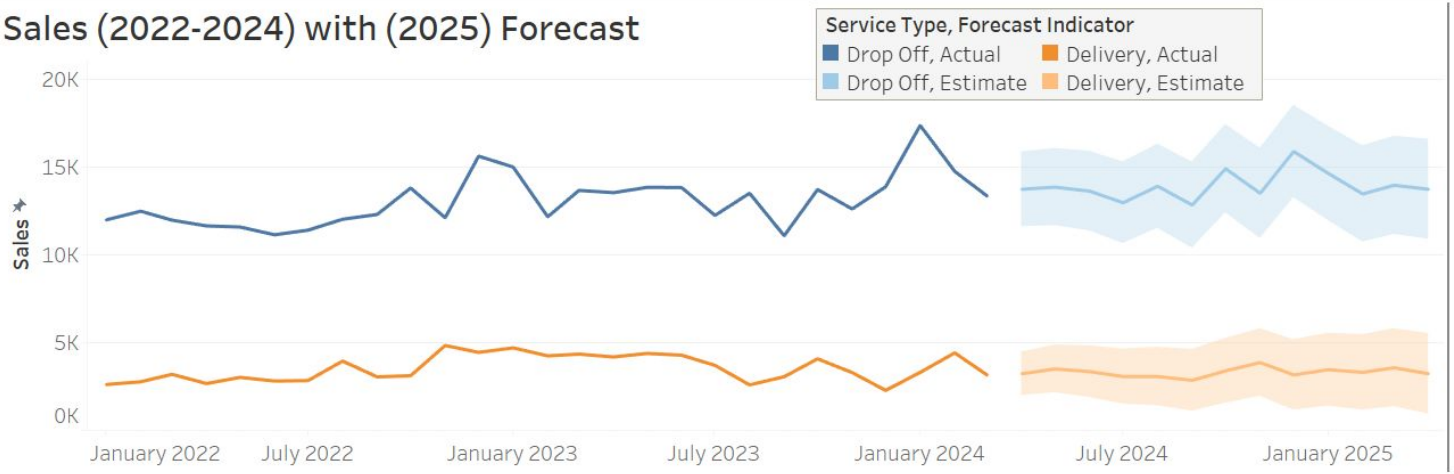
Sales

Total Lifetime Sales	Drop Off Sales	Delivery Sales
$448,739	$353,239	$95,500

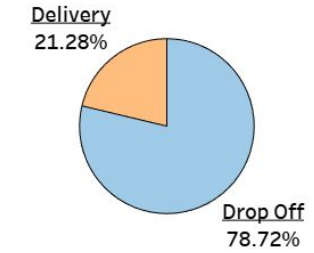
Customers

Total Lifetime Customers	Drop Off Customers	Delivery Customers
26,028	23,301	2,727

Sales (2022-2024) with (2025) Forecast



Sales Proportions



Top Drop Off Customers

Customer ID	Sales
252	$20,428.79
464	$7,932.76
279	$7,042.88
237	$5,933.81
437	$5,189.73
800	$4,915.45
119	$4,780.25
468	$4,756.29
247	$4,492.97
496	$4,147.19

Top Delivery Customers

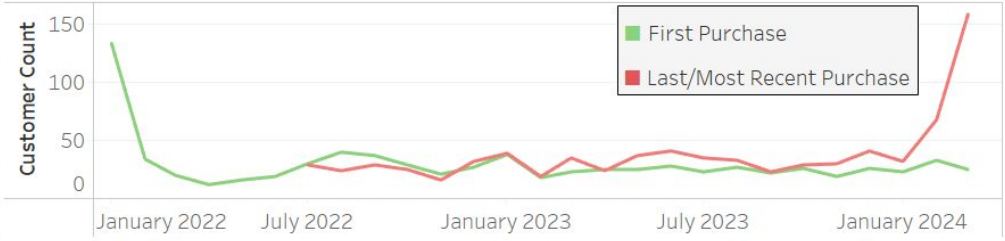
Customer ID	Sales
8	$8,921.45
62	$5,558.89
70	$4,609.03
20	$4,547.53
13	$4,479.30
19	$3,986.43
81	$3,722.66
36	$3,129.43
1	$2,722.18
7	$2,645.63

High Risk Customers

Customer ID	Probability
257	0.125
220	0.128
219	0.150
255	0.151
247	0.160
227	0.165
36	0.165
239	0.170
234	0.178
222	0.179

Customer First (Join Date) & Last (Most Recent) Purchase Trends

Note: last purchase increases at the end as data is until March 2024 and so is the most recent purchase for many customers



Conclusion

-This project identified customer segments to deliver to the marketing team for promotions and targeted retention strategies

-Thorough analysis of sales data highlighting drop off and delivery services performance trends

-Erica’s Laundry will leverage data to explore opportunities and realize future growth and potential

Thank you for your time

And thank you to Erica’s Laundry for an engaging project and collaboration

If you would like to connect, feel free to reach me

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Reference

-Google Colab Link:
https://colab.research.google.com/drive/1wHsmHXeZmgWBYnmpvHqkwLZGPYBpTGFl?usp=sharing