Next Purchase Prediction

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DSML

Final Project

Outline

- Introduction

- What's the use?

- Data

- EDA

- Models

- Results

- Product Demo

Introduction

- **Objective:** Predicting the existing users' next product purchase

- **Objective 2:** Reactivate inactive users and generate revenue

- No browsing data

- Inspiration from real life business need for targeting inactive users

- App returns a product ID

- It can be used for targeting

- Reactivation campaigns

- Personalization
    - Communication and Website/App

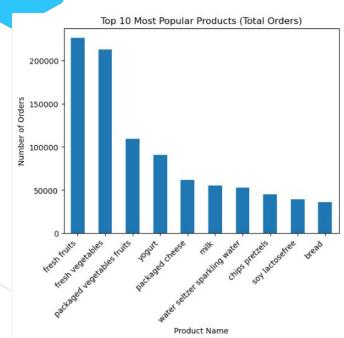- Better utilizing customer base
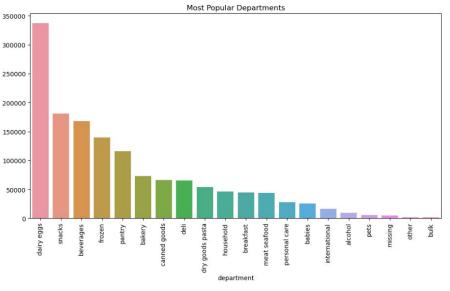
- Generation revenue

Data

- Online supermarket data from Kaggle
  - https://www.kaggle.com/datasets/hunter0007/ecommerce-dataset-for-predictive-marketing-2023/data
- 2019501 orders
- 106000 customers

user_id	order_number	order_dow	order_hour_of_day	days_since_prior_order	product_id	add_to_cart_order	reordered	department_id	department	product_name
49125	1	2	18	NaN	17	1	0	13	pantry	baking ingredients
49125	1	2	18	NaN	91	2	0	16	dairy eggs	soy lactosefree
49125	1	2	18	NaN	36	3	0	16	dairy eggs	butter
49125	1	2	18	NaN	83	4	0	4	produce	fresh vegetables
49125	1	2	18	NaN	83	5	0	4	produce	fresh vegetables

EDA

EDA

EDA

Top 10 Most Reordered Items
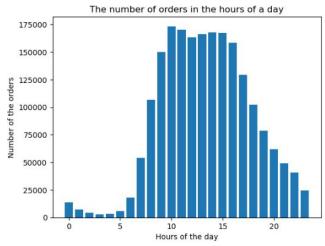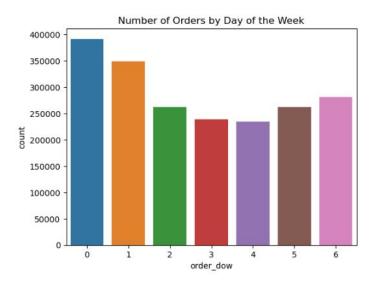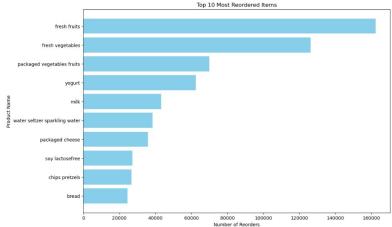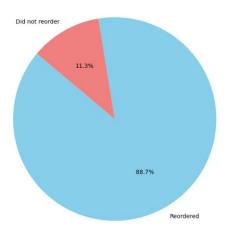
Proportion of Users Who Reordered

Models

Random Forest Regression

	precision	recall	f1-score	support
0	0.72	0.58	0.64	165713
1	0.74	0.84	0.79	238188
accuracy			0.74	403901
macro avg	0.73	0.71	0.72	403901
weighted avg	0.73	0.74	0.73	403901

CatBoost

	precision	recall	f1-score	supp
0	0.73	0.53	0.62	165
1	0.73	0.87	0.79	238
accuracy			0.73	403
macro avg	0.73	0.70	0.70	403
weighted avg	0.73	0.73	0.72	403

LightGBM

	precision	recall	f1-score	support
0	0.72	0.51	0.60	165713
1	0.72	0.86	0.78	238188
accuracy			0.72	403901
macro avg	0.72	0.69	0.69	403901
weighted avg	0.72	0.72	0.71	403901

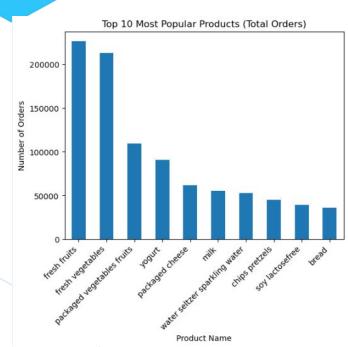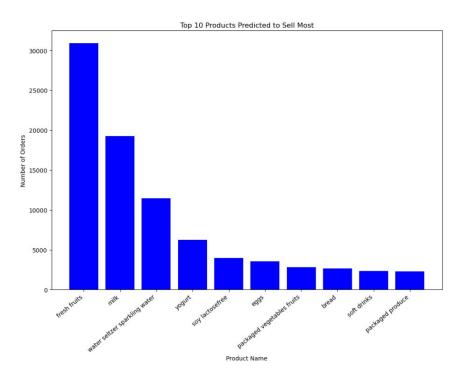# Results

Applied the model to all users and generated prediction for their next purchase

user_id	product_id	product_name
49125	115	water seltzer sparkling water
58222	86	eggs
17427	83	fresh vegetables
145672	115	water seltzer sparkling water
158122	24	fresh fruits
171617	24	fresh fruits

Results

Top 10 Most Popular Products (Total Orders)

Top 10 Products Predicted to Sell Most

App Demo

How to use it?

- Website Personalization
- Targeting (Ad Personalization)
- Push Notification
- Email Personalizations
- Supply Chain Management
- Possibly increase reorder and revenue