



Predicting and Reducing Bank Churn

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Our Team



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Why is bank churn important?

“56% of customers who left a bank stated that their decisions **could have been reversed**, and acquiring a new customer can cost **5x** more than retaining an existing one”



Business Understanding

*Can we predict what features cause bank
customers to churn to determine what should be
targeted for marketing campaigns?*



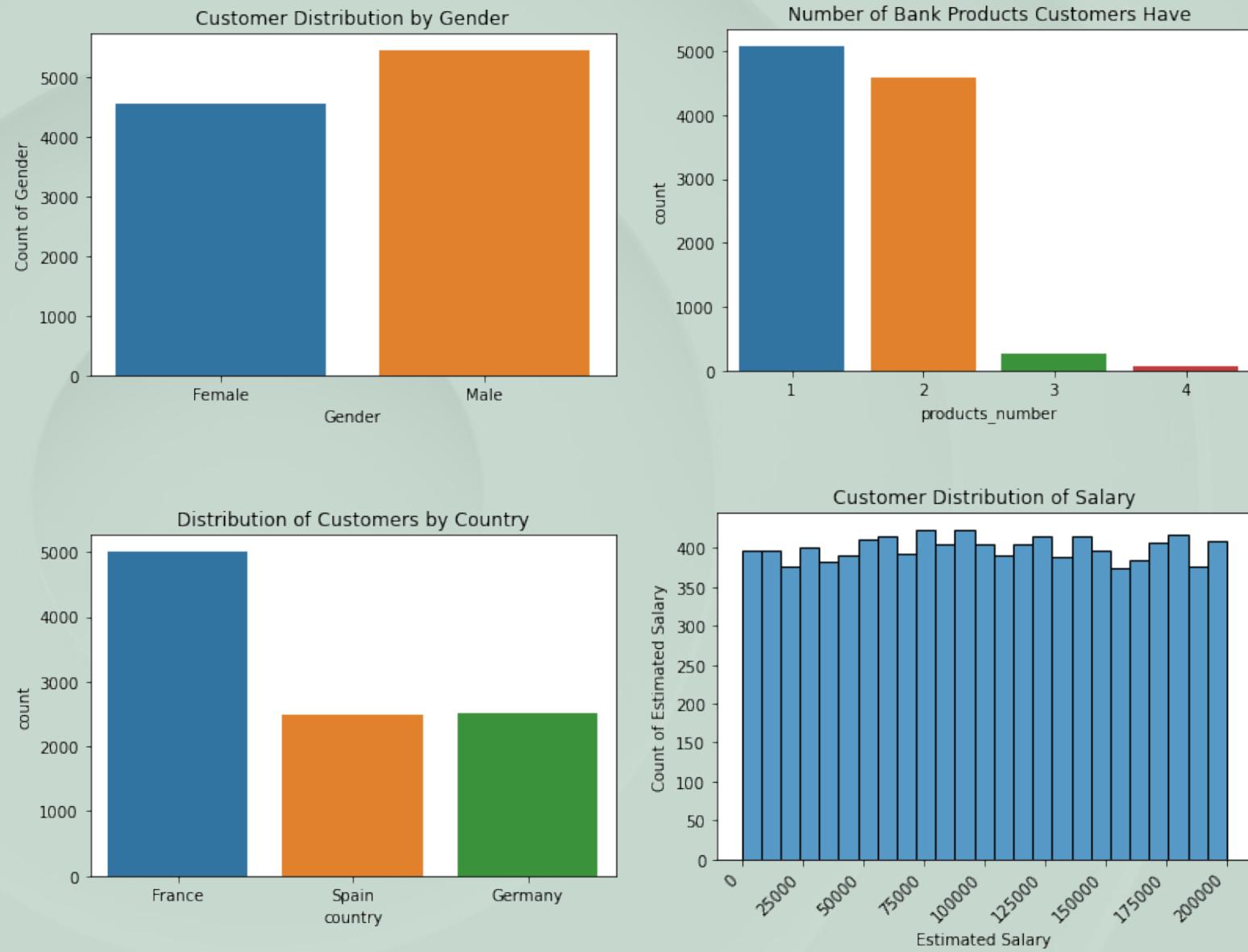
Data Understanding and Background

- **Dataset:** [Bank Customer Churn Dataset](#)
- **Geography:** France, Germany, and Spain
- **Business Goal:** Predict churn
- **Success metrics:** Reduced churn and increased customer retention
- **Benefits:** Improved customer retention, increased customer satisfaction, and potentially higher revenue due to retained customers

Data Analysis

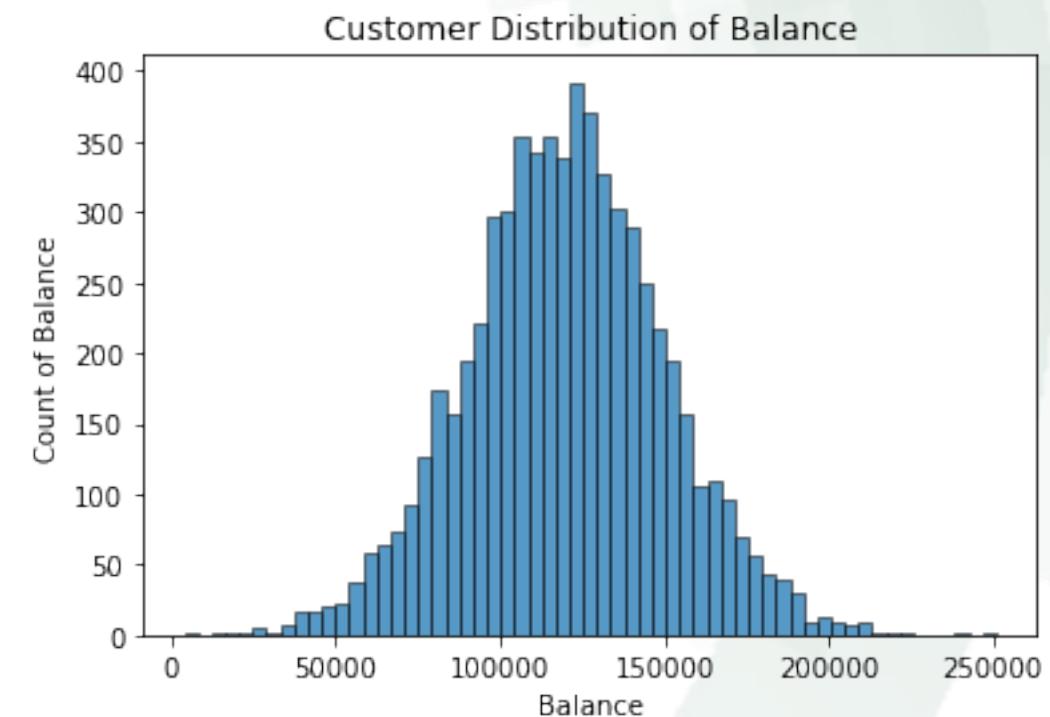
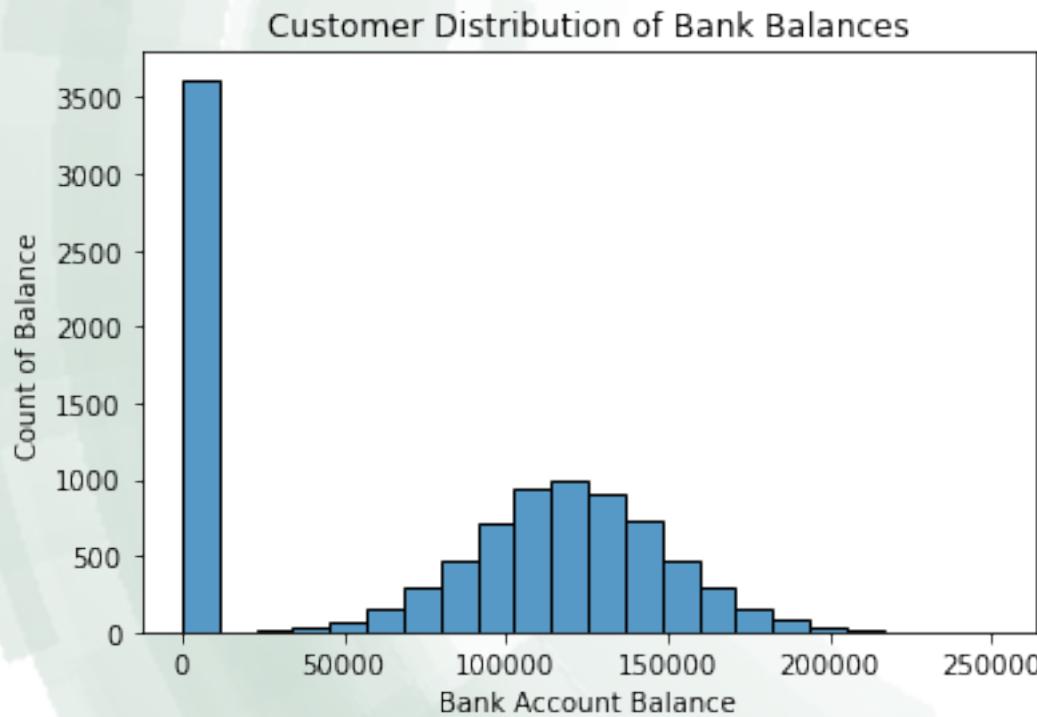
Intro to Dataset

- 10,000 customer data points
- **Key Features:** Age, Gender, Credit Score, Tenure, Balance, Salary, Active Member, Country, Number of Products
- **Assumptions:**
 - Currency: US Dollars
 - Active Member
 - Tenure

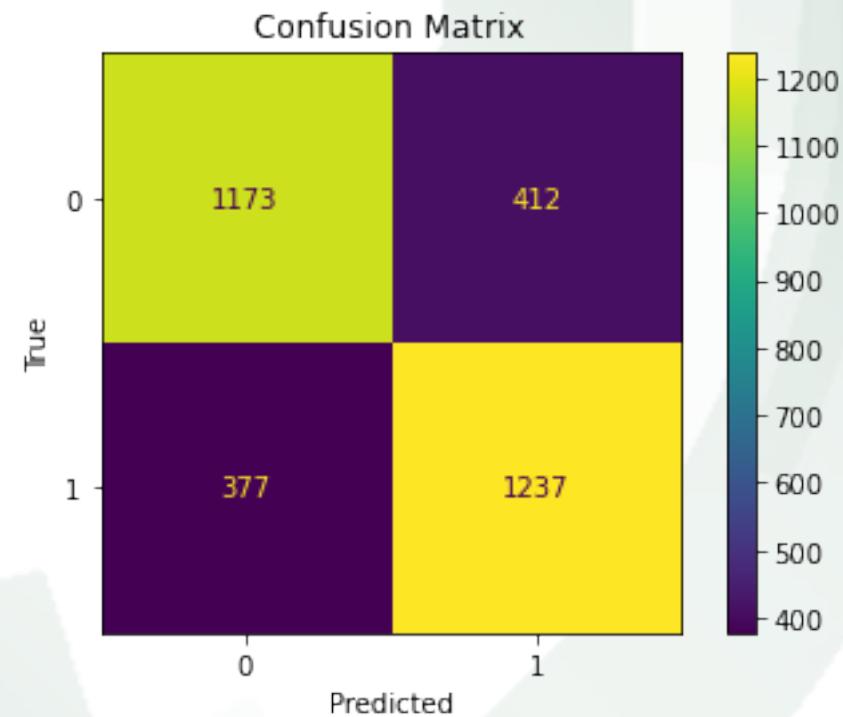
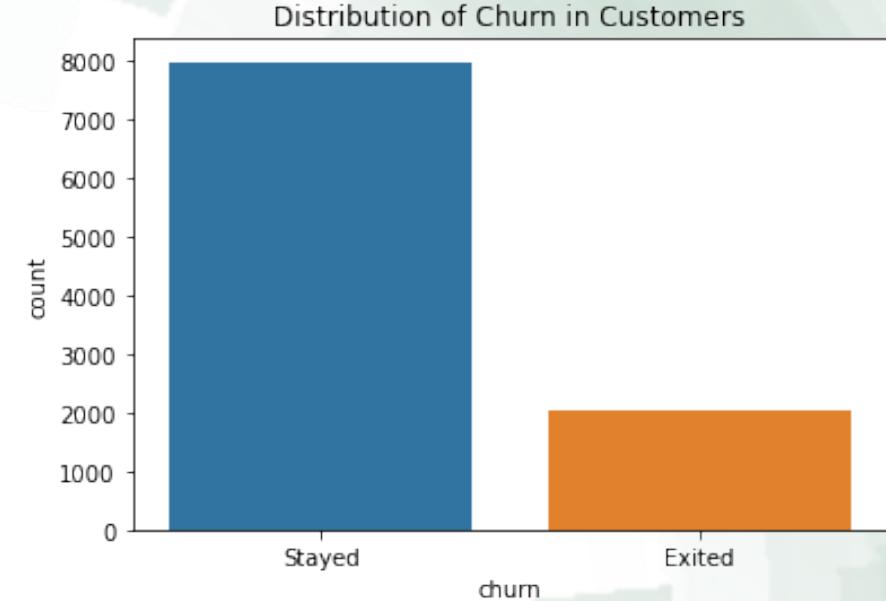
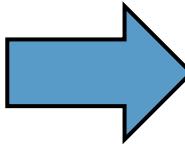
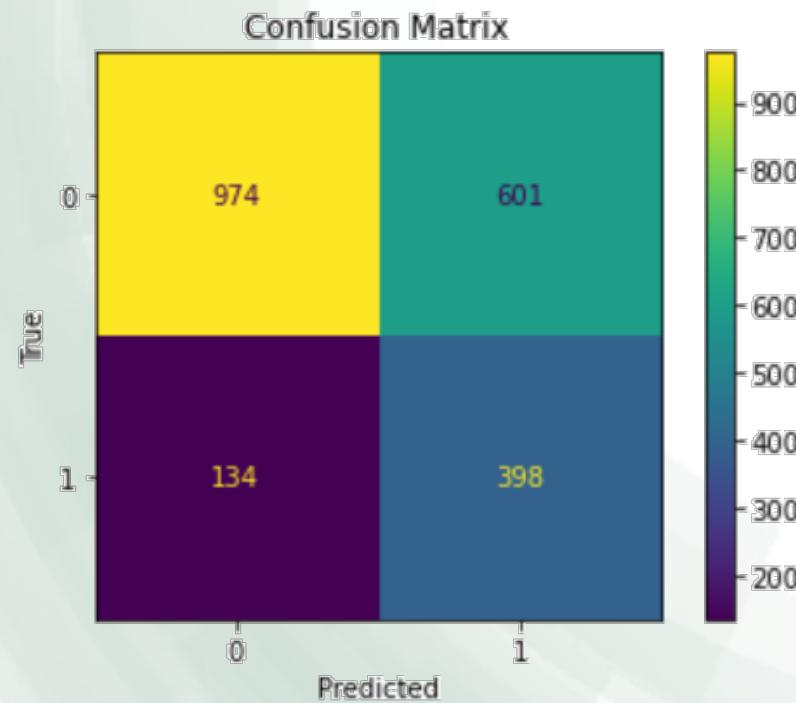
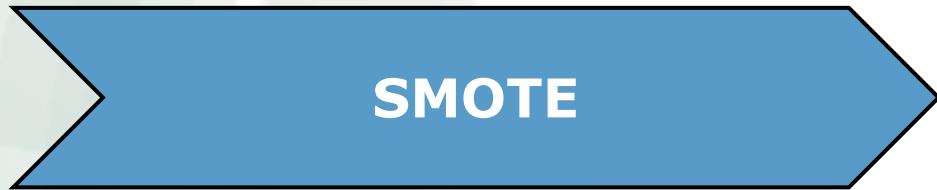


Data Preparation and Cleaning

Zero Balance Points
Removed



Data Preparation: Imbalanced Dataset

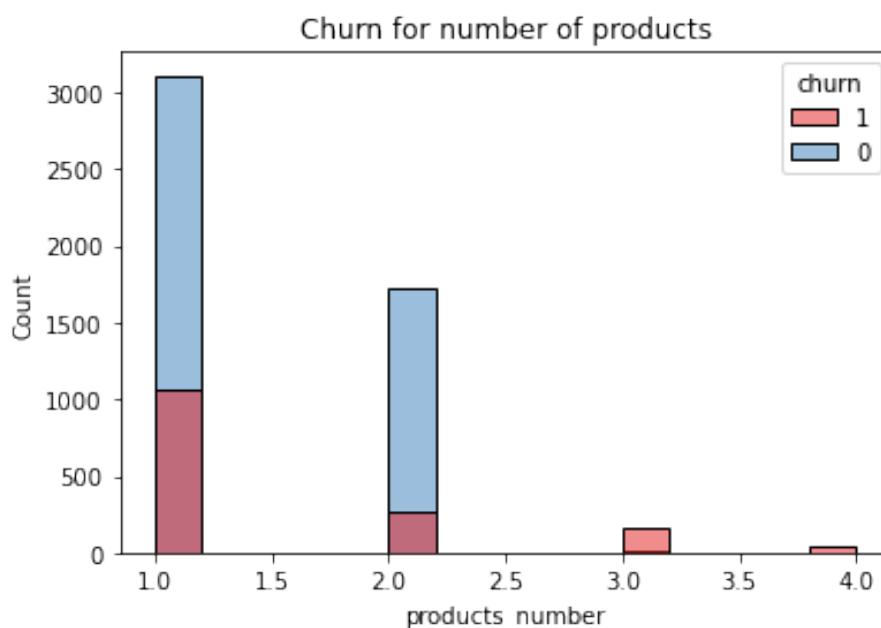


Initial Feature Analysis by Churn Rate

Age

age	(17.926, 25.4]	(25.4, 32.8]	(32.8, 40.2]	(40.2, 47.6]	(47.6, 55.0]	(55.0, 62.4]	(62.4, 69.8]	(69.8, 77.2]	(77.2, 84.6]	(84.6, 92.0]
churn										
0	5.36	19.05	30.13	12.49	4.17	2.11	1.39	1.05	0.14	0.03
1	0.53	2.01	5.62	6.66	5.81	2.54	0.72	0.17	0.02	0.00

Number of Products



Active Member

Churn	Idle Member	Active Member
No	33.26	42.66
Yes	15.38	8.69

Modeling Results

Main Prediction Models

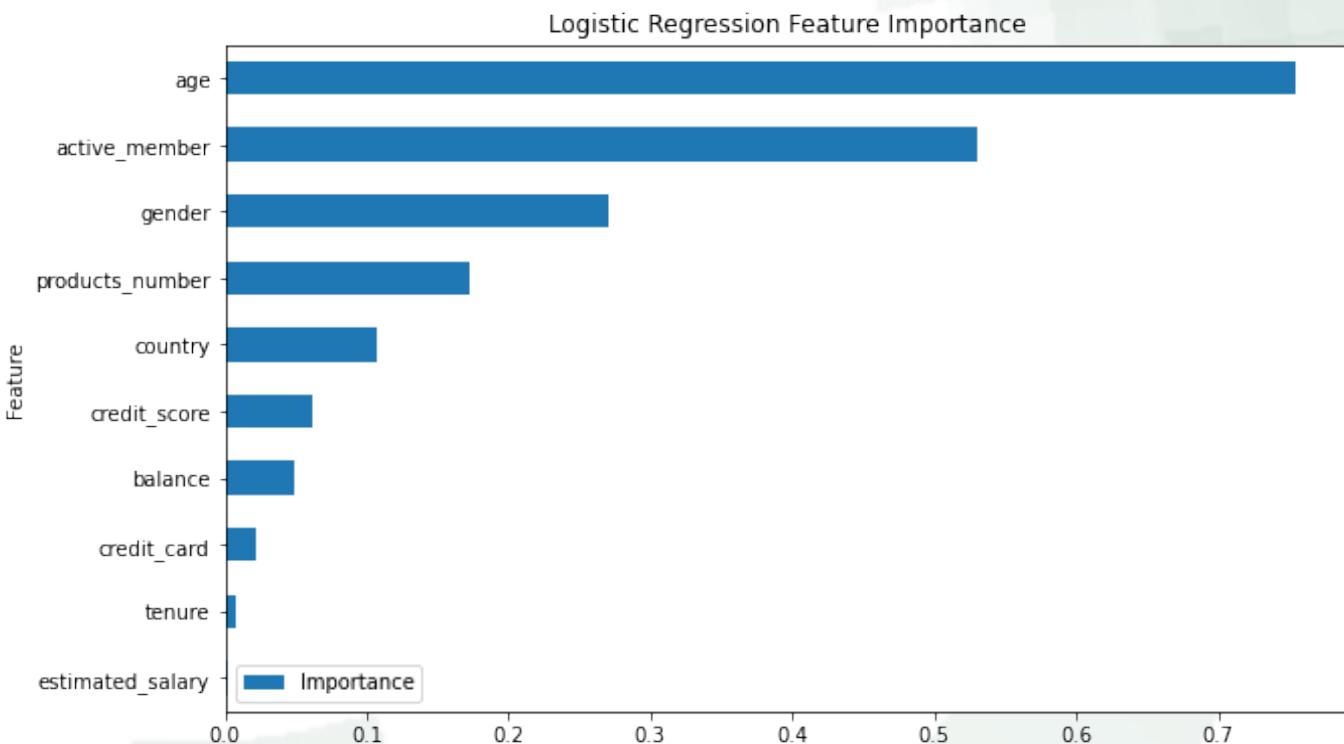
Logistic Regression Model Evaluation

	Precision	Recall	F1 Score
No Churn	0.7568	0.7401	0.7483
Churn	0.7502	0.7664	0.7582

	coef	P> z
const	-3.7435	0.000
credit_score	-0.0006	0.060
age	0.0739	0.000
tenure	-0.0101	0.355
estimated_salary	1.631e-07	0.770
balance	1.835e-06	0.084
products_number	0.3045	0.000
active_member	-1.0649	0.000
credit_card	-0.0050	0.943
gender	-0.5197	0.000
country	0.1377	0.001

Feature Importance

Using the logistic regression, we determined that **age, active member, gender and number of products** had the most affect on if a customer was predicted to churn.



Features to Identify Customers Most Likely to Churn

Recommendation: Focus on age, active members, and number of products when creating marketing campaigns and new products

1

Age



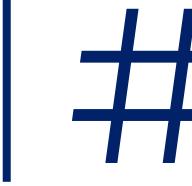
2

Active Member



3

Number of Products



Modeling Results

The table below depicts the three major features for the top 10 customers predicted to churn based on our logistic regression model.

Age

- 60+ were most likely to churn
- Younger customers less likely to churn

Active Member

- Inactive members were more likely to churn

Number of Products

- Customers with lower number of products (1/2) are predicted more likely to churn than those with higher number of products (3/4) or more products

	gender	age	products_number	active_member	pred
923	0.0	67.0	1.0	0.0	0.981306
2715	0.0	77.0	1.0	0.0	0.980574
2015	0.0	63.0	2.0	0.0	0.977712
1748	0.0	70.0	2.0	0.0	0.977344
313	0.0	68.0	3.0	0.0	0.976607
129	0.0	68.0	1.0	0.0	0.975322
2262	0.0	70.0	2.0	0.0	0.972018
849	0.0	60.0	1.0	0.0	0.970943
2312	0.0	64.0	2.0	0.0	0.970566
1850	0.0	60.0	1.0	0.0	0.967891



Applicability

- **Features:** Age, Active Member, and Number of Products
- **Benefit:** Better chance for informed decision making for marketing campaigns.
 - Targeted customer outreach for higher retention rate.
- **How:** Offer products influencing age, active members and number of products

Conclusion

Overall Results

Retain customers using marketing campaigns / products that directly influence churn

Age

- Retirement planning
- Senior-friendly banking

Number of Products

- Bundle Discounts
- Limited-time promotions

Active Member

- Exclusive Rewards Program
- Customized Investment Portfolios
- Premium Account Services

What Next?

Collect more detailed data involving consumer behavior and investigate zero balance accounts to further increase revenue

Data Limitations and Future Research

- **Geographic Scope:** Data by bank location, narrow by currency type
- **Consumer Behavior:** Additional features, live interactions, customer reviews of respective banks
- **Existing Products Analysis:** Quality of existing bank products, customer reviews
- **Better Defined Features:** Zero balance customers, length of inactivity to be considered an idle customer, analysis on churn



Questions?

