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# Data Science for Business – Final Project

## Telecom Customer Churn Analysis

**DSB Group 9**

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# The level of customer churn is a key metric for most telecom companies and indicative of performance

## Definition of Customer Churn

In the telecom industry, customer churn refers to **the rate at which customers stop using a company's services**.

Acquiring new customers in this industry is significantly higher than retaining customers.



## Reasons for Churning

### Irrelevant Services

The customer no longer requires the services provided

### Switches to other Providers

The customer switches to a new telecom provider

### Life Situations

Extenuating life circumstances, such as moving or deaths

### Involuntary Removal

Customer is removed from service due to default or non bill payments



High customer churn means **higher operating costs** and **lower profits**

# Through a data analysis process, customer churn can be minimized with maximum efficiency



1

Collect customer demographic data



2

Determine customers that are most likely to churn



3

Deploy retention marketing campaigns to these customers



4

Retain customer base and achieve higher profits



Collect customer demographic data based on differentiating factors such as types of services that the customer is subscribed for, payment methods, and marital status.

## EXAMPLES

- Senior status
- Payment method
- Partner status
- Status of streaming services

With the collected demographic data, determine which customers have the highest probability of churning.

## EXMAPLES

- Seniors may be a demographic that is less likely to churn due to apathy
- People with more services may be more willing to stay

Implement marketing programs targeted to these separate demographics to reduce the likelihood of them to churn.

## EXMAPLES

- Social media marketing campaigns based on age demographics
- Different service offerings

With less customers churning, revenue decrease is prevented and less money is needed to acquire new customers to maintain a steady/growing user base.



# To analyze the customer data, the following steps were completed to gain valuable insights

## 1 Cleanup data for processing

Take the CSV of the customer data and clean it up. This requires omitting any irrelevant data in the dataset that prevents predictive modelling.

## 2 Logistic regression

Perform a logistic regression on the data and determine the correlation with the different pieces of customer information and their impact on the likelihood of that customer to churn

## 3 Clustering

Classify the different customer segments with a clustering analysis, determining the optimal number of segments with as much variability between the clusters as possible

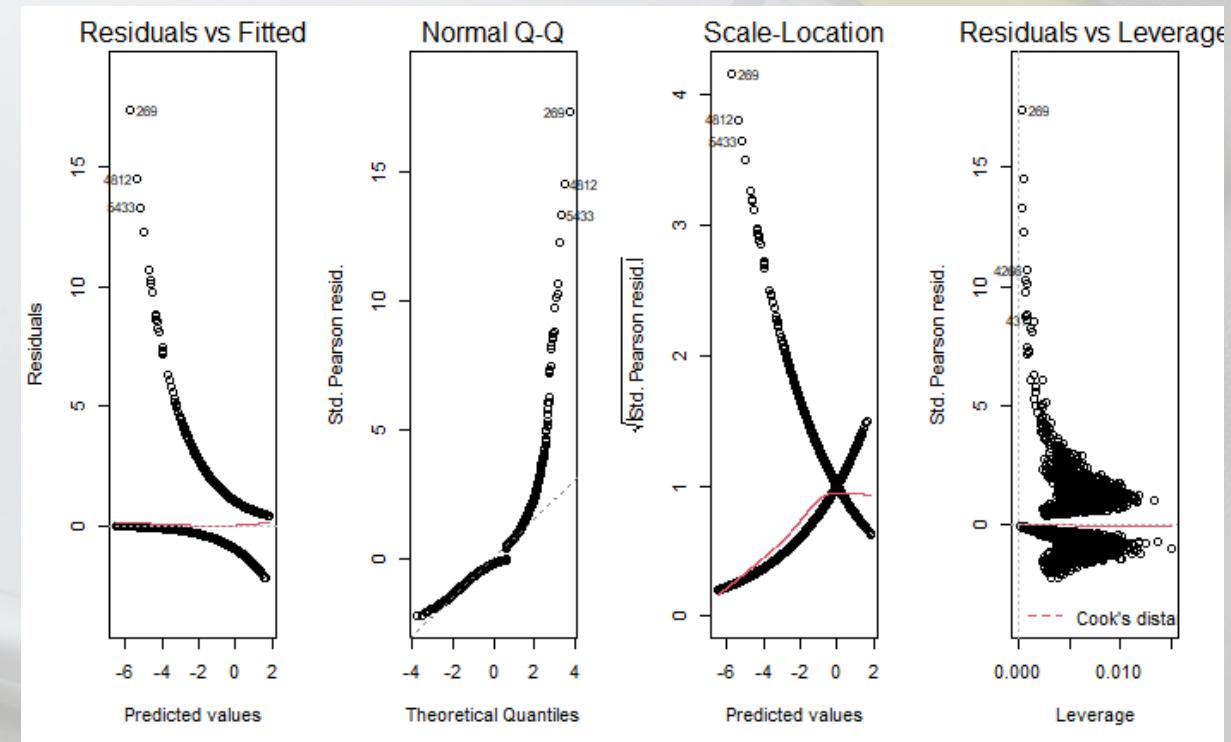
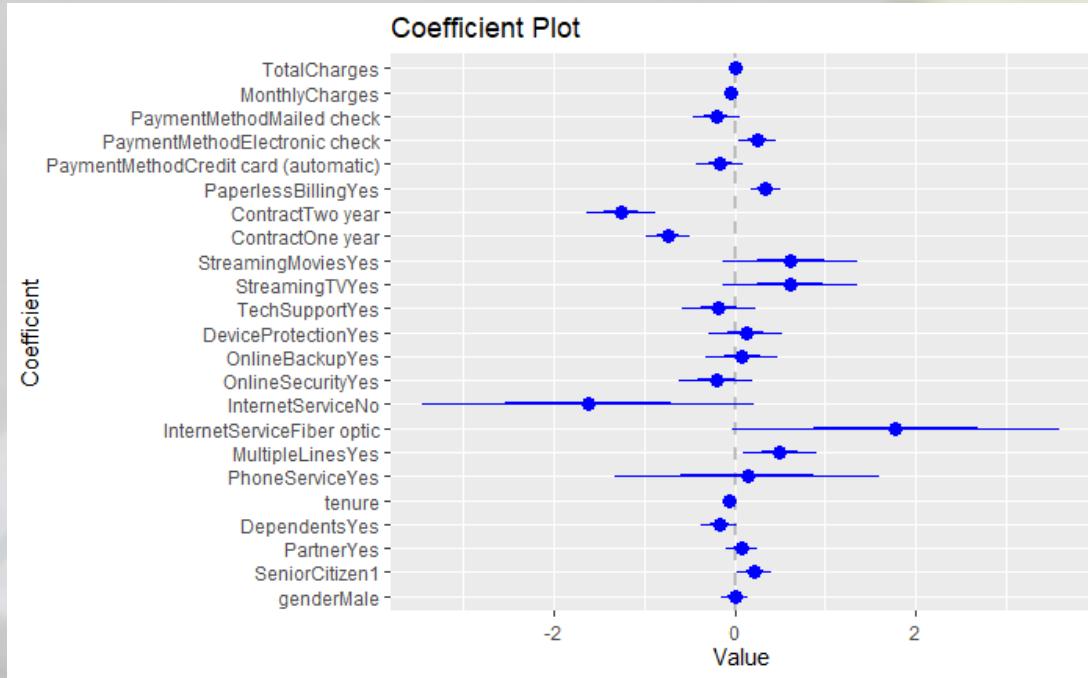
## 4 Repeat regression on the identified clusters

With the identified clusters from step 3, a new clustering analysis could give even more insights into different clusters.

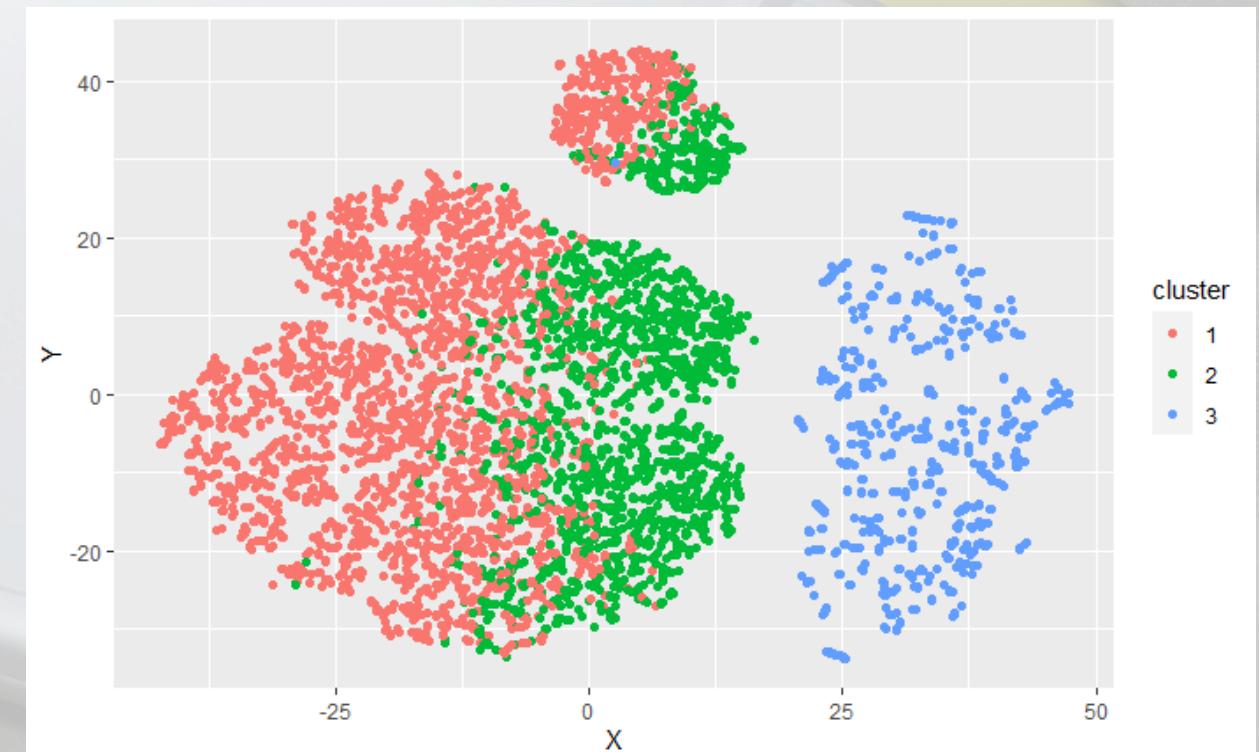
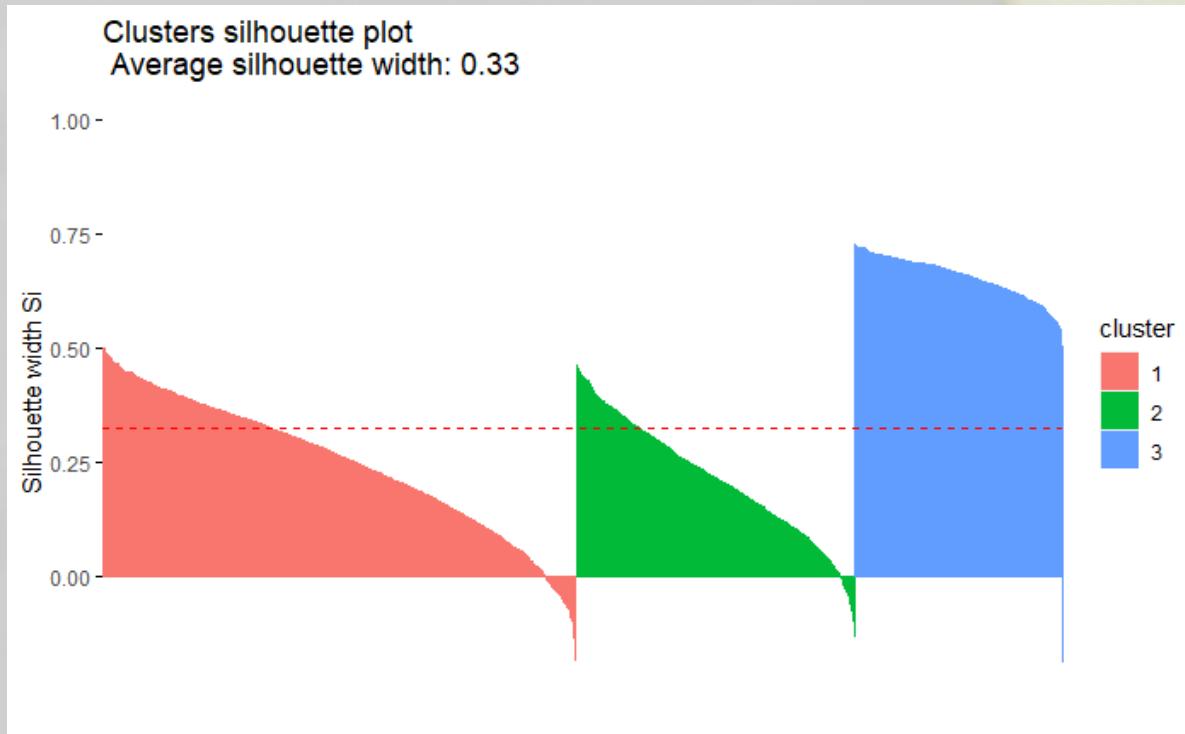
## 5 Feature Engineering

Identify relevant features from raw data and re-run regression to produce more accurate predictive models

# A logistic regression had the following outputs based on 20 different variables of customer information



# A clustering analysis identified the optimal number of clusters at three with the following characteristics



# Clustering analysis has identified a customer segment that has a churn rate 6 times higher than other segments



## CLUSTER 1 (SINGLES)

**43%**

Churn Rate

## CLUSTER 2 (FAMILIES)

**13%**

Churn Rate

## CLUSTER 3 (NO INTERNET)

**7%**

Churn Rate

### FEATURES

- Most likely to churn
- Has the lowest number of people that have dependents
- Overwhelming majority have month to month contracts
- Likely young singles

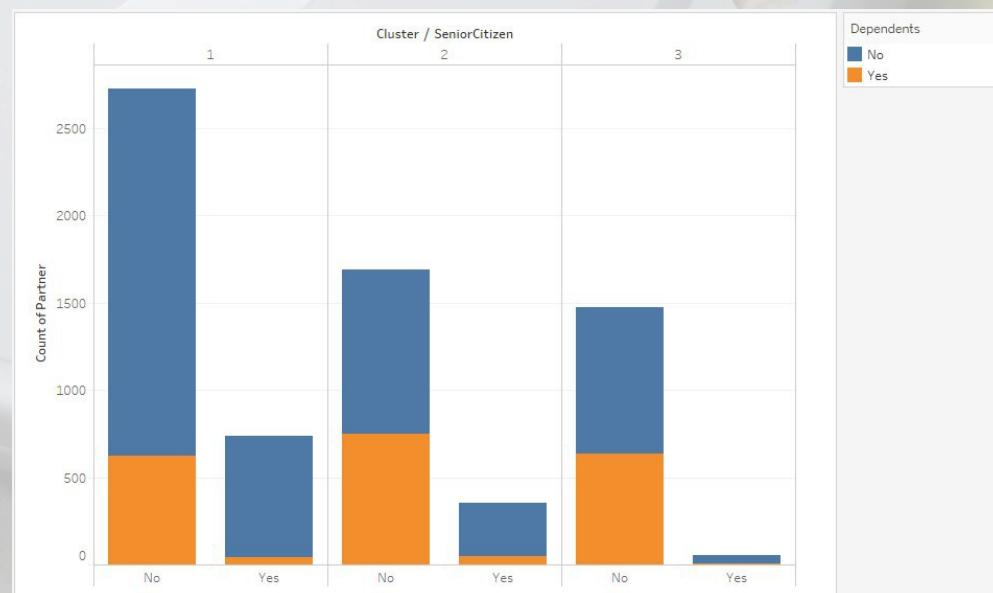
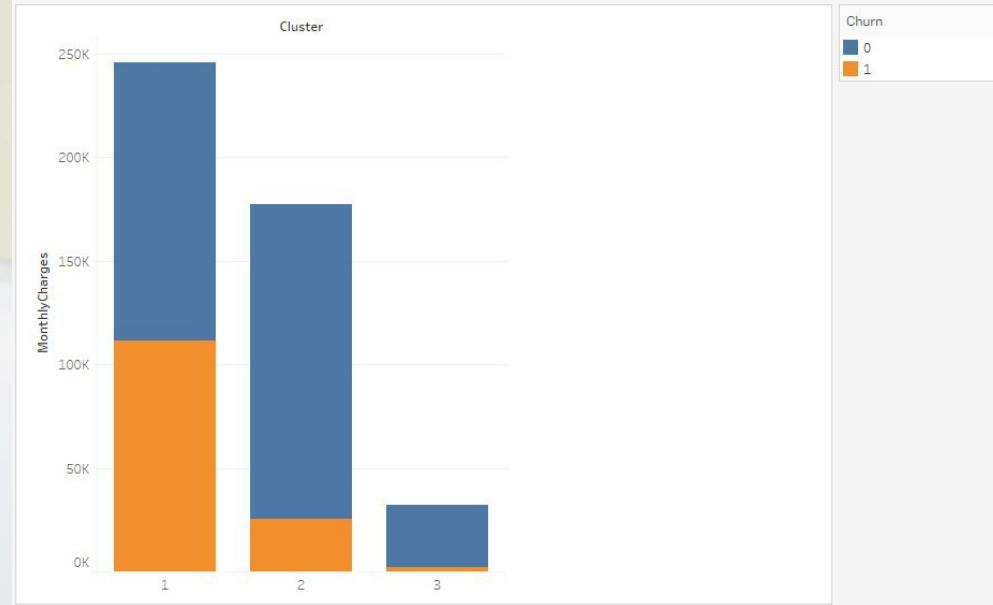
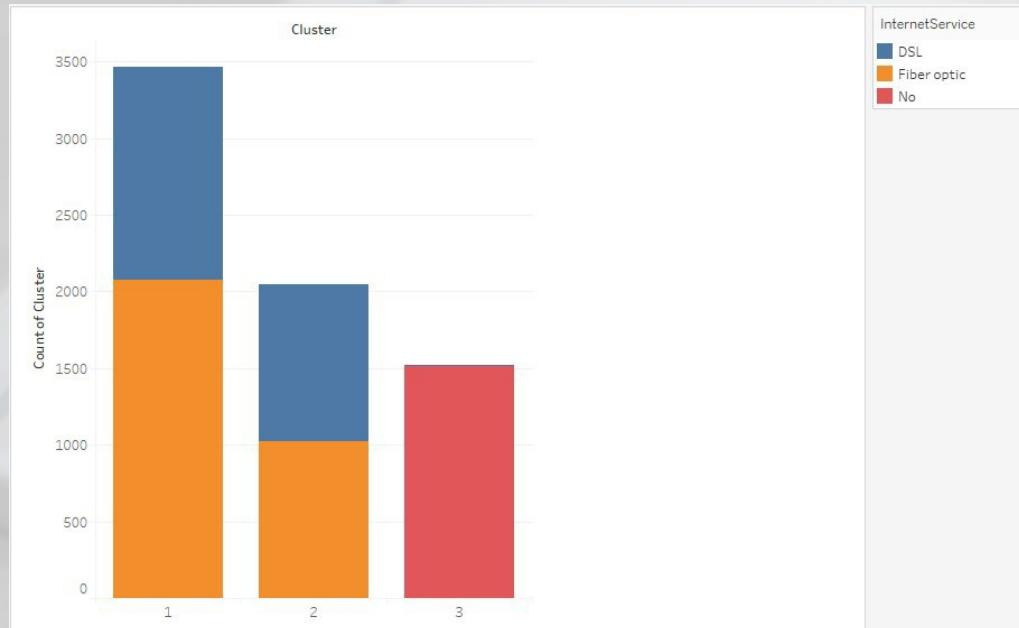
### FEATURES

- Characterized by the highest monthly charges
- Average tenure is 56 months
- Large majority has device protection and movie streaming services
- Likely family members with many services

### FEATURES

- Least likely to churn
- 100% in the cluster do not have internet service, and associated services
- Has the least number of seniors compared to other clusters
- Likely young children with basic services

# Insights on the raw data were found through tableau and visualized



# Retention marketing plans should target singles with a focus on converting month-to-month contracts to long-term



## Incentivize customers to sign longer-term contracts

Customers in this cluster are overwhelming in a monthly contract with the telecom provider. Incentive schemes to convert these customers to a long-term contract should be created, such as discounts on mobile phones, more flexible contract options, and membership perks.



## Make sure to include internet service in longer-term contracts

In this cluster, 100% of customers have internet service, indicating that it is a crucial service offering for them. Longer-term contracts should include internet service and added internet perks, such as discounts on auxiliary internet services (streaming, data protection, etc.)



## Focus on single user services

Some telecom companies have incentive schemes designed to encourage users to bundle up users. Given that users in this cluster are overwhelmingly single without dependents, marketing efforts should focus on single user services



## Do not neglect seniors in marketing campaigns

A significant number of customers in this segment are senior. Thus, marketing campaigns should ensure this demographic is still within reach. Marketing campaigns that target seniors can include paper ads, outreach programs at retirement homes, and in-person sales people



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