

Telco Customer Churn Project

By David VH

What are we trying to accomplish?

- ◎ Predict
- ◎ Reduce
- ◎ Strategize

Data Set

Telco Customer Churn for Quarter 3

- ◎ Demographics
- ◎ Status
- ◎ Services
- ◎ Location
- ◎ Population

Data Cleaning

Demographics

- ◎ Marriage Status
- ◎ # of Dependents
- ◎ Is the customer a senior citizen

Location

- ◎ Zip Code
- ◎ Longitude/Latitude

Services

- ◎ All Services
 - phone
 - internet
 - streaming
 - other
- ◎ Time with Telco (months)
- ◎ Billing info

Status

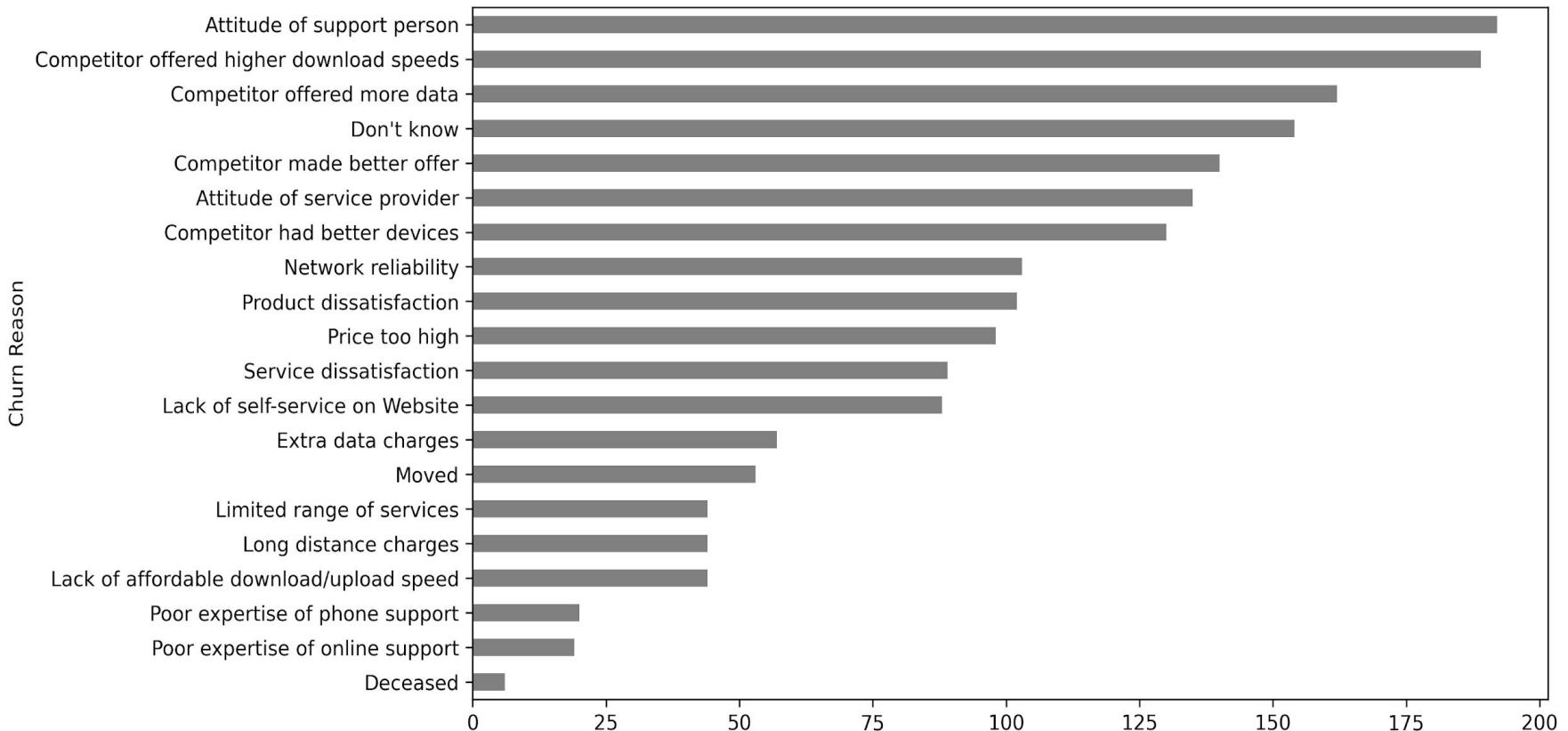
- ◎ **Churn Value**
 - Our target variable

Exploring the data

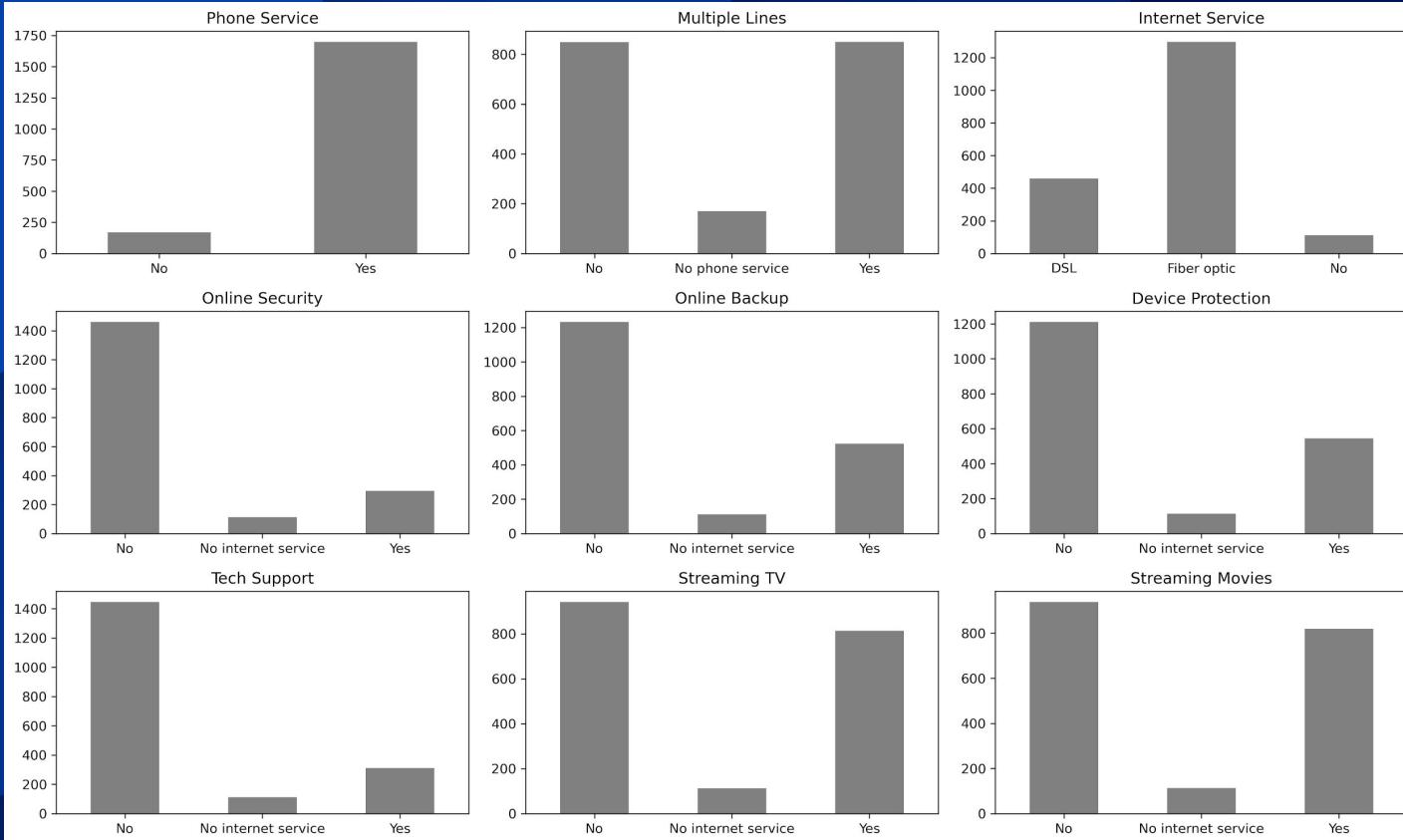
Two main reasons given for leaving:

- ◎ Competitor Offers
- ◎ Technical support issues

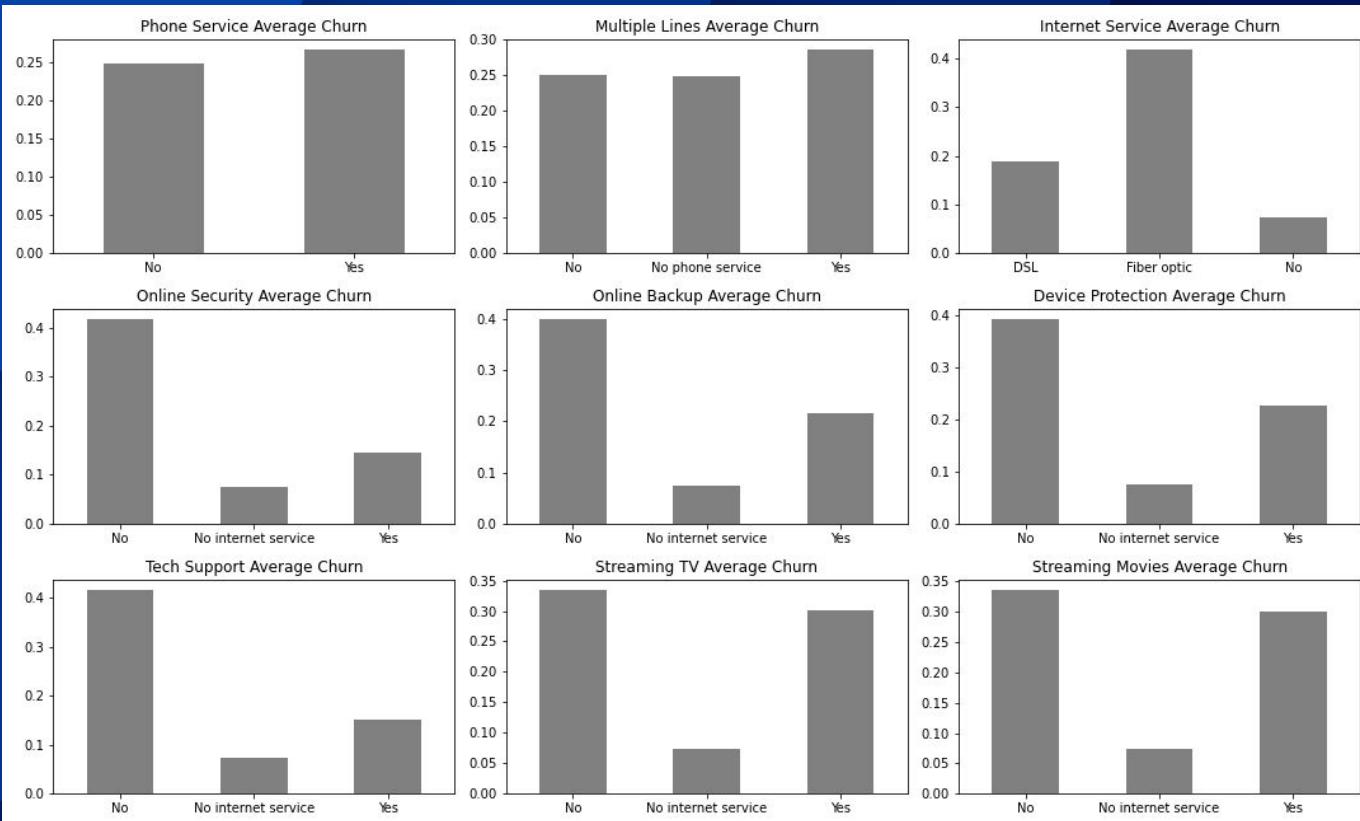
Total Churn based on reasons for churn



Total churn per service



Average Churn per service



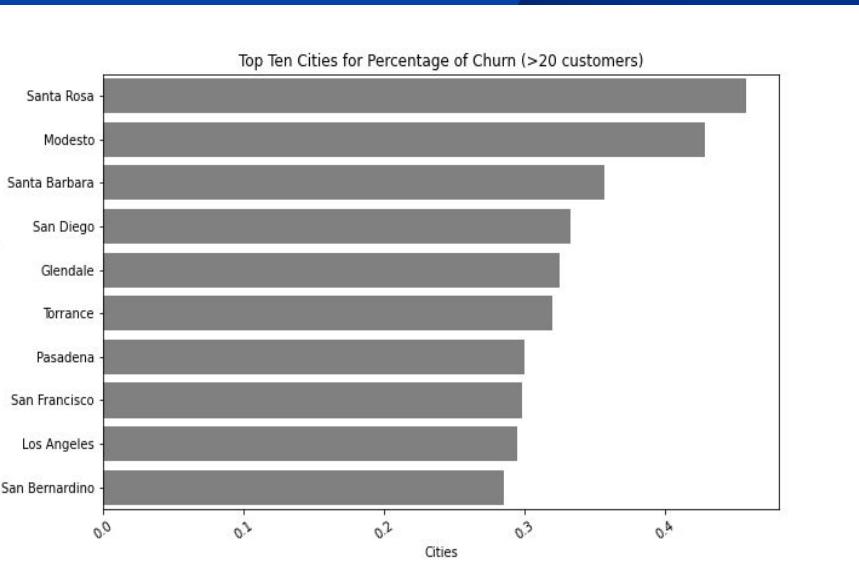
Comparison of services

Takeaways:

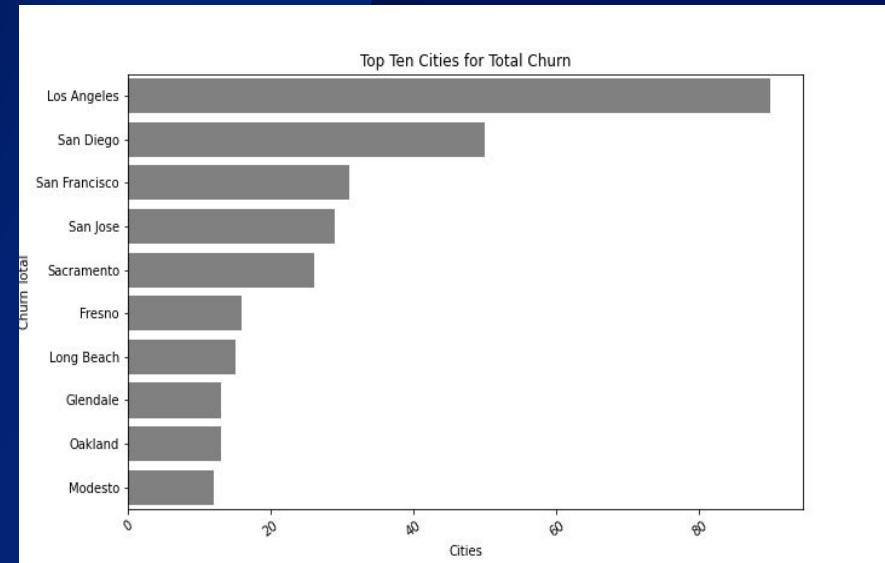
- ◎ Fiber optics customers twice as likely to leave!!
- ◎ Customers without optional services more likely to leave

City Comparison

Churn Percentage



Churn Total



Creating the model

Feature selection in model creation

- ◎ **Tenure Months**
- ◎ **Internet Service_Fiber optic**
- ◎ **Contract_Month-to-month**
- ◎ **Contract_Two year**
- ◎ **Payment Method_Electronic check**

(Selected using SelectKBest from scikit learn)

Models created for comparison

- ◎ **K Means Classifier**
- ◎ **Ridge Classifier**
- ◎ **Support Vector Classification**
- ◎ **Sequential Neural Network**

Metrics

True Positive Rate Comparison

Model	True Positive Rate
K Means	0.910079
Ridge	0.914032
SVC	0.898221
Sequential NN	0.907115

Ridge Classifier model

- ◎ Grid Search results
 - alpha = 0.1
 - Intercept =
-0.4737177
- ◎ Coefficients for Ridge:

Parameter	Coefficient
Tenure	-0.20184005
Fiber Optics	0.20546116
Month-to-month	0.14302479
Two-year	0.01090988
Electronic Check	0.10947003

Evaluating the model

- ◎ **Tenure has an inverse relationship to churn**
- ◎ **Fiber optics has largest positive relationship to churn**
- ◎ Two year contracts do not affect churn a great deal
- ◎ Payment method does have some effect on churn

Coefficients

Parameter	Coefficient
Tenure	-0.20184005
Fiber Optics	0.20546116
Month-to-month	0.14302479
Two-year	0.01090988
Electronic Check	0.10947003

Model Comparison to business rules

Tested model against three basic business rules

1. Customers with Telco for 16 months or less will churn
2. Customers with Month-to-Month contract will churn
3. Customers with Month-to-Month contract AND fiber optics will churn

Model/Business Rules	True Positive Rate
Ridge	0.914032
Rule 1	0.762846
Rule 2	0.571146
Rule 3	0.794466

Recommendations

Recommendation 1

Customers with Fiber Optics should be given incentive to sign longer term contracts.

Recommendation 2

Customers should be offered Technical support services as part of their plans more regularly.

Future Improvements

- ④ Collect more data to make a better model
- ④ Increase more features for model creation
- ④ Research competitor offers

