

Predicted Churn Rate Reduction for Telephone Services Using Marketing Analytics

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Motivation

The churn analysis is crucial for telephone services companies because the cost of retaining an existing customer is far less than acquiring a new one. Companies from these sectors often have customer service branches which attempt to win back defecting clients, because recovered long-term customers can be worth much more to a company than newly recruited clients.

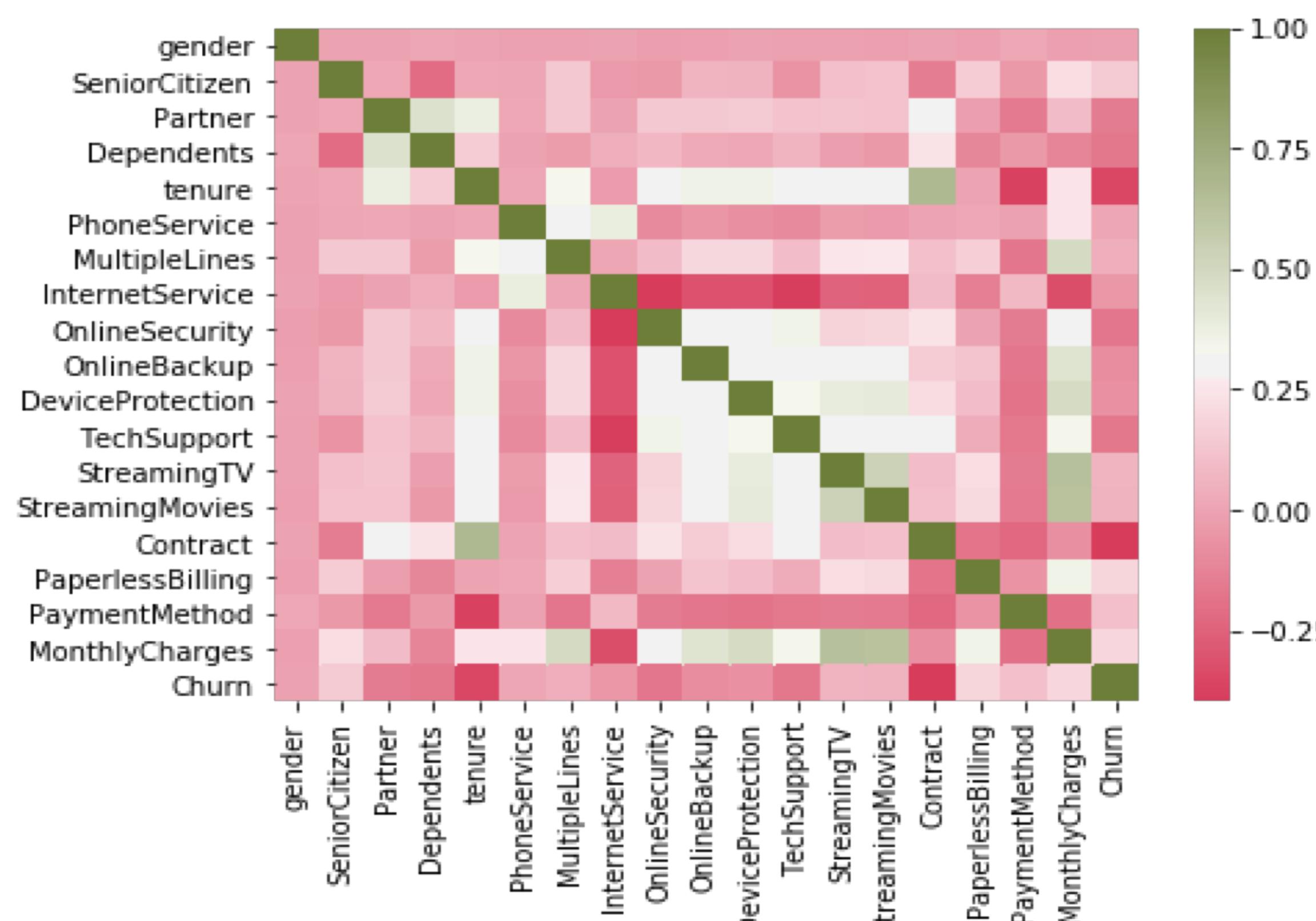
Technologies

- Using Python to identify the relationships among different features of the dataset
- Using Tableau to generalize plots for visualization
- Using Solver to build optimization model and find the optimum solutions

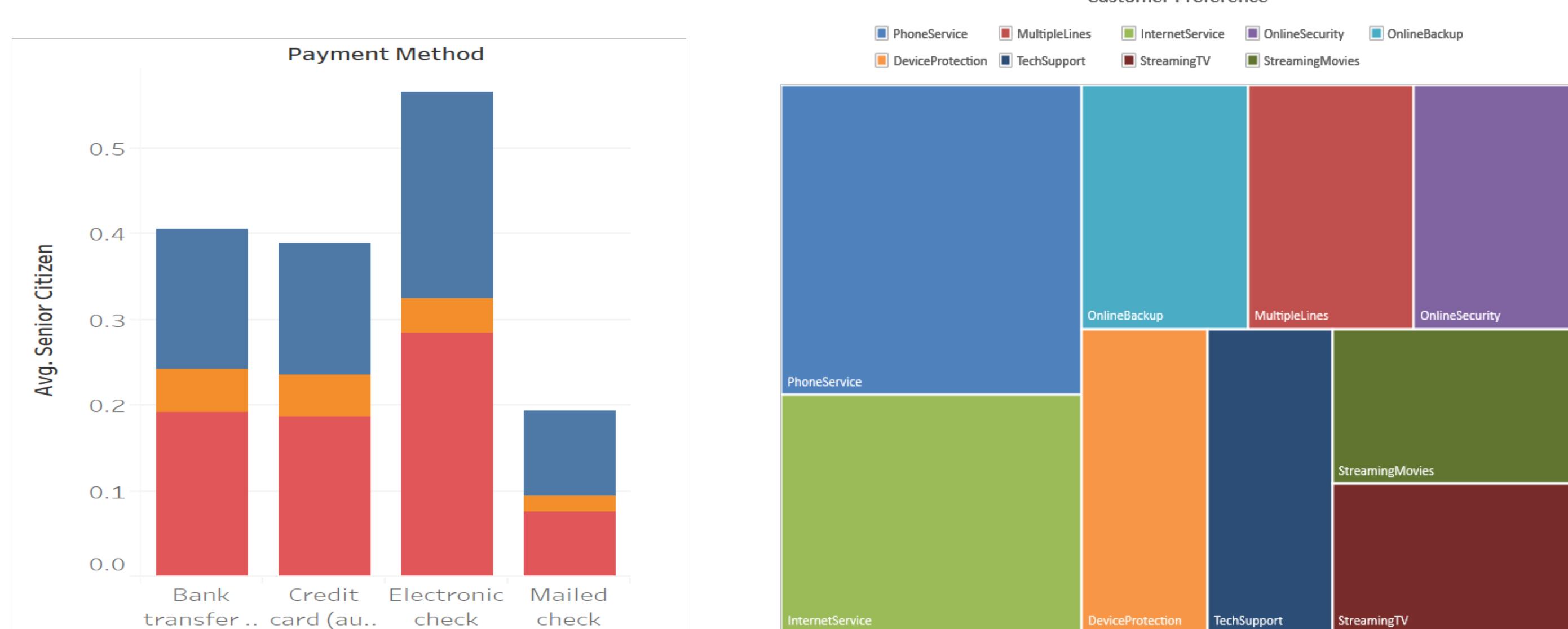
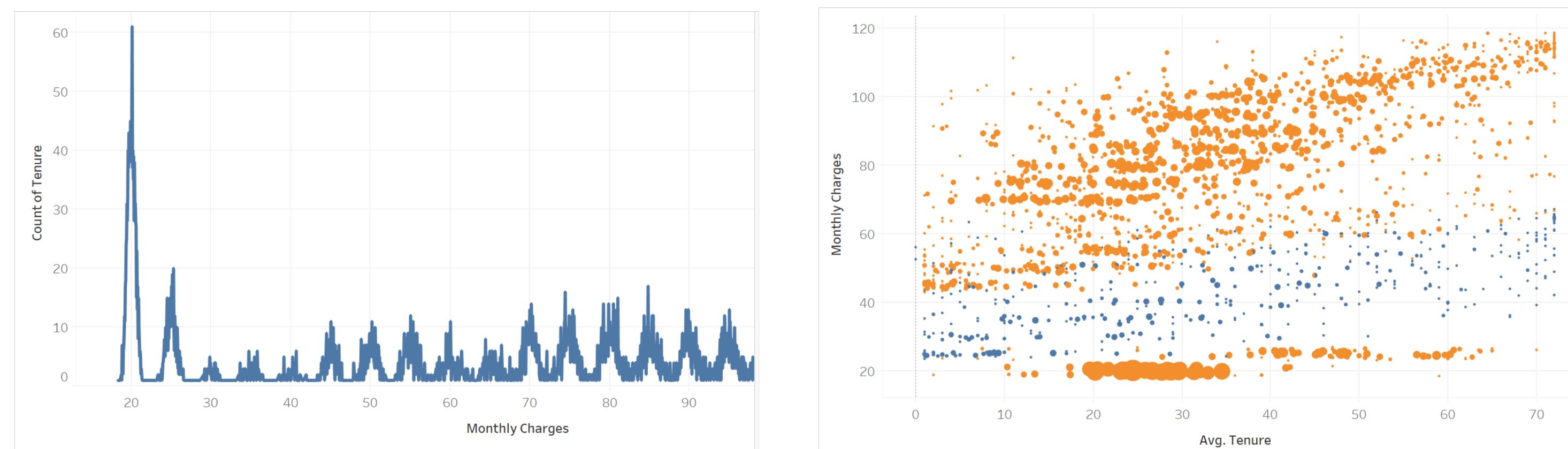


Data Understanding

Correlation Matrix



Further understanding



Optimization Model

Marketing Optimaztion Model			
Tenure	Estimated Churn No.	Retain-Confidence	Gross Month Avg-Income
(0,12]	1319	30%	\$ 69.75
(12,24]	398	40%	\$ 83.66
(24,36]	227	50%	\$ 90.70
(36,48]	123	50%	\$ 98.46
(48,60]	81	50%	\$ 101.20
(60,72]	44	50%	\$ 103.44
Tenure	Discount for 1st Year(X1)	Discount for 2nd Year(X2)	Discount for 3rd Year(X3)
(0,12]	10%	10%	23%
(12,24]	15%	15%	35%
(24,36]	17%	17%	40%
(36,48]	19%	19%	45%
(48,60]	24%	24%	55%
(60,72]	28%	28%	65%
Discount Details:			
For 1st Year	X1		
Increased by			
For 2nd Year	X2=X1*(1+a)	a=	0%
For 3rd Year	X3=X2*(1+b)	b=	134%
Estimated Cost			
Price of Internet Service			\$ 25
Months For Discount Year1		Year2	Year3
12	39,570	39,570	92,419
12	17,893	17,893	41,790
12	11,663	11,663	27,240
12	7,110	7,110	16,605
12	5,722	5,722	13,365
12	3,674	3,674	8,580
Estimated Financial Effect			
Tenure	Marketing Period/Months	Expected Total Income	Expected Total Cost
(0,12]	36	993,643	171,559
(12,24]	36	479,455	77,576
(24,36]	36	370,598	50,566
(36,48]	36	217,999	30,824
(48,60]	36	147,550	24,810
(60,72]	36	81,922	15,927
Total		2,291,165	371,261
			<= 400,000
Constraints			
Tenure	The Least Discount Rate for 1st Year	The Least Discount Rate for 3rd Year	The Maximal Discount Rate for 3rd Year
(0,12]	10.00%	20.00%	30.00%
(12,24]	10.00%	35.00%	40.00%
(24,36]	10.00%	40.00%	50.00%
(36,48]	10.00%	45.00%	55.00%
(48,60]	10.00%	55.00%	65.00%
(60,72]	10.00%	65.00%	70.00%
Maximal Gross Profit		1,919,904	

Classification Model (Churn)

