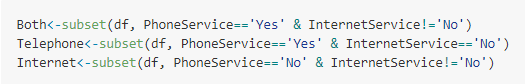
Assignment 7- Telco Churn

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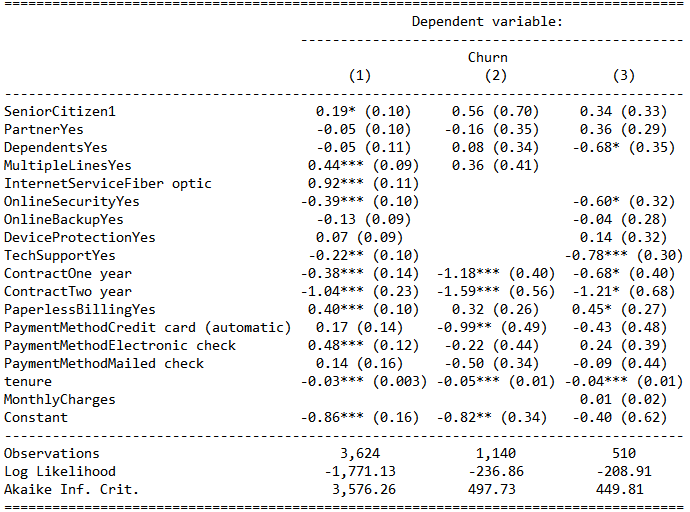
1. I did the following steps:
   1. I checked for nulls in the main data set. There were 11 nulls so I removed those rows completely.
   2. Encoded Churn column
   3. I made separate data sets for Telephone only, Internet only and for customers using both services using the following block of code. 
   4. Then I converted all categorical variables to factors in the 3 data sets.
   5. Dropped irrelevant columns from each data set. For example, all internet related columns were dropped in the telephone only dataframe.

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| --- | --- | --- |
| **Applicable to all Customers (All data frames)** | | |
| **Variable** | **Effect** | **Rationale** |
| Partner | -ve | People with partners will likely have more users associated with their subscription so churning would be harder because switching cost might be high. |
| Dependents | -ve | People with dependents will likely have more users associated with their subscription so churning would be harder because switching cost might be high. |
| Senior Citizen | -ve | Senior Citizens are more likely to avoid changing subscriptions because they might fear getting used to the new subscriptions. |
| Payment Method | +ve/-ve | Automatic Payments might reduce churn since it will reduce involuntary churn due to unintentional non-payment. |
| Contract | +ve/-ve | Customers with month-to-month subscription might be more likely to churn because of the low commitment of the customer to the service to begin with. |
| Paperless Billing | +ve | Without receiving a mailed bill, customers could forget to send payment leading to involuntary churn. |
| Tenure | -ve | The longer the customer has stayed with the company, chances are that they are satisfied with the services and won’t churn. |
| Monthly Charges | -ve | Higher the charges, more the chances that a lower price alternative is available. (This variable would only be included if the model passes VIF test) |

|  |  |  |
| --- | --- | --- |
| **Specific to all Telephone Customers** | | |
| **Variable** | **Effect** | **Rationale** |
| Multiple Lines | -ve | More lines mean more customers are affected with the churn meaning that the switching cost might be high. Thus, reducing churn. |

|  |  |  |
| --- | --- | --- |
| **Specific to Internet Customers** | | |
| **Variable** | **Effect** | **Rationale** |
| Online Security | -ve | Online security shows commitment towards the subscription therefore the chances to churn would be less. |
| Online Backup | -ve | These customers are also using backup services meaning their switching costs would be higher leading to less churn. |
| Device Protection | -ve | Companies often have device protection if the customer has purchased the product from them on finance often. This hints towards longer contract terms and hence lesser chances to churn. |
| Tech Support | -ve | Tech support is a very important element of service. Customers with tech support might have a better overall experience of the subscription. |
| Internet Service **(for customers who have both telephone and internet)** | +ve/-ve | Fiber Optic Internet is expensive, and customers will demand great performance if they opt for it. This opens the possibilities for cheaper alternatives and since the customers would demand high speeds, therefore performance will be important. So, chances of churn here are higher if performance is not up to the mark |

StreamingTV, StreamingMovies and gender are not included since there was no evidence that it effected churn of customers.  
Total Charges was not included because of high correlation with tenure.

1. The stargazer of the 3 Logit models is shown below:  
   

4)

5)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Model** | | |
| **Measure** | **Customers with Both** | **Customers with Telephone only** | **Customers with Internet only** |
| Accuracy | 76.2% | 84.5% | 78.8% |
| AUC | 73.3% | 77.4% | 76.1% |
| Precision | 65% | 69% | 70% |
| Recall | 62% | 29% | 57% |
| F-1 Score | 0.63 | 0.41 | 0.63 |