**CIS 9660 FINAL PROJECT REPORT By Xiang Pan and Jing Kunzler**

Stated Question:

Senior citizens are more likely to churn? Is age affected by other aspects on churning decision?

Background & Data:

Why should we care about customer churn decisions? According to an article by Outbound Engine, which cited other studies, acquiring a new customer can cost five times more than retaining an existing customer. [1] In this analysis we focus on variables that will not be influenced by the dependent variable, and show interesting differences across levels to further investigate. Based on our experiences as consumers, we formed a hypothesis that senior citizens are less likely to churn, because they prefer sticking with habits, such as using traditional payment methods and sticking with the same contracts.

After cleansing the dataset we employed:
https://www.kaggle.com/blastchar/telco-customer-churn, the following describes the definition of each independent variable, and the dependent variable used in the analysis:

| | | |
|---|---|---|
| **SeniorCitizen**: 0 = Is not a senior citizen; 1 = Is a senior citizen (common defined as over 65 years old) | **Partner**: Yes/1 = Has a partner; No/0 = Does not have a partner (kinds of partners undefined) | **Dependents**: Yes/1 = Has dependent(s); No/0 = Does not have any dependents |
| **PaperlessBilling**: Yes/1 = Uses paperless billing; No/0 = Does not use paperless billing | **Payment_ElectronicCheck**: 1 = Uses electronic checks to pay; 0 = Does not use electronic checks | **Payment_BankTransfer**: 1 = Uses bank transfer to pay; 0 = Does not use bank transfer |
| **Payment_MailedCheck:** 1 = Uses mailed checks to pay; 0 = Does not use mailed checks | **Payment_CreditCard:** 1 = Uses credit cards to pay; 0 = Does not use credit cards | **Churn**: Yes/1 = Will churn; No/0 = Will not churn |

*(See infographic below for summary statistics findings)*

We used a decision tree to identify key variable of interest: SeniorCitizen. Then we used LPM and Logistic regression to compare predictions on senior citizens' effect on churn or not churn. The results are consistent. Please refer to the infographics for detailed outputs.