PART 1:

a) a)

A close-up of a computer code

Description automatically generated

b) Number of customers in calibration and validation set

A close-up of a computer code

Description automatically generated

c)



d)



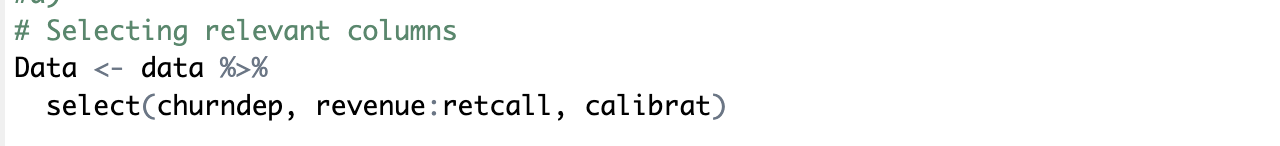
Results for a), b) c) and d)

A screenshot of a computer code

Description automatically generated

b) Data Cleaning

a)



b)

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Description automatically generated

c)

Running logistic model

A computer screen shot of a computer code

Description automatically generated

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Description automatically generated

Odds Ratios for all variables in Data under training set

A close-up of a number

Description automatically generated

A close-up of a credit card

Description automatically generated

Two highest Odds ratios

retcall (Customer has made a call to retention team): With an odds ratio of 2.288920, customers who have made a call to the retention team are 2.29 times more likely to churn than those who have not, holding other variables constant. This is statistically significant (p = 2.199318e-05).

refurb (Handset is refurbished): An odds ratio of 1.2604818 means that customers with a refurbished handset are 1.26 times more likely to churn than those with a new handset, ceteris paribus. This relationship is also statistically significant (p = 7.761796e-13).

Two lowest Odds ratios

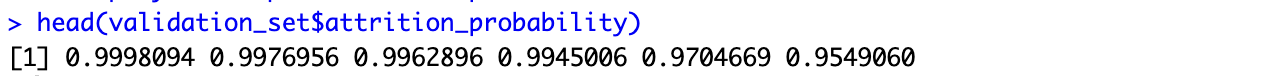
actvsubs (Number of Active Subs): As a count variable, the odds ratio of 0.8129321 suggests that for each additional active subscription, the odds of churning decrease by approximately 18.7%. More active subscriptions are associated with a lower probability of churn. The significance of this relationship is confirmed by the p-value (p = 2.272651e-13).

creditaa (High credit rating - aa): Since this is a dummy variable, the odds ratio of 0.6977511 indicates that customers with a high credit rating are approximately 30.2% less likely to churn than those without a high credit rating, all other factors being equal. The statistical significance is very strong (p = 7.239558e-25).

D) Predicting attrition probabilities

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Description automatically generated



PART 2:

1. Data frame (i.e., data matrix) with odds ratios and p-values as 2 columns

A computer code with text

Description automatically generated with medium confidence

Output:

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Description automatically generated

1. Function to check non-missing values

Function:

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Description automatically generated with medium confidence

Apply the custom function (#calculate\_sd) to each column in the dataframe to calibrate data i.e. Validation Set

A close-up of a computer code

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1. Merging df1 and df2

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Description automatically generated

1. e) Rounding the decimals and then exporting the results to csv file.

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Description automatically generated

CSV file written from R

A screenshot of a data table

Description automatically generated

f)

Calculating economic importance for each variable in CSV file. Following are the steps followed to calculate importance.

* Opened the CSV file in Excel
* Checked if the variable is Dummy or Not (performed manually by using Min and Max values from Cell2Cell Data Documentation.xls) and created a column adjacent to variable name
* Calculated X value for dummy variables : OR^SD, for non-dummy variables : OR
* Importance: For X>1, importance = X; For X<1, importance = 1/X.

A screenshot of a data

Description automatically generated

PART 3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variable Name | Variable Description | Dummy/not | OR | P-Value | Standard Deviations | Importance | Actionable |
| eqpdays | Number of days of the current equipment | Non-Dummy | 1.00147 | 0 | 250.179 | 1.44411 | Yes |
| creditaa | High credit rating - aa | Dummy | 0.69775 | 0.00002 | 0.34890 | 1.433178 | Yes |
| refurb | Handset is refurbished | Dummy | 1.26048 | 0.02269 | 0.33938 | 1.260480 | Yes |
| occhmkr | Occupation - homemaker | Dummy | 1.235300 | 0.00000 | 0.05665 | 1.235300 | No |
| actvsubs | Number of Active Subs | Dummy | 0.81293 | 0.02223 | 0.62519 | 1.230118 | No |
| uniqsubs | Number of Uniq Subs | Non-Dummy | 1.20536 | 0.00046 | 0.83754 | 1.205360 | No |
| credita | Highest credit rating - a | Dummy | 0.83729 | 0.01485 | 0.31078 | 1.194329 | Yes |
| retaccpt | Number of previous retention offers accepted | Dummy/not | 0.87020 | 0.03685 | 0.12848 | 1.149161 | Yes |

1. For each actionable and statistically significant predictor variable, the retention action suggested can be the following –
2. Creditaa –

Negative and actionable

To increase customer loyalty and retention, provide special discounts and rewards to clients with an excellent credit rating (aa).

1. Refurb –

Positive and actionable

To encourage customers to stay on board with their subscription, give customised incentives, such as unique device offers or discounted plans, to those who purchase refurbished handsets.

1. Credita –

Negative and actionable

To strengthen customer commitment to Cell2Cell, tailor programs and provide additional benefits to those with the best credit rating (a).

1. Retaccpt –

Positive and actionable

Create personalized retention offers with extra features and advantages to retain clients who have already accepted prior offers.

1. Eqpdays-

Positive and actionable

Its Importance is higher the equipment is older, customers might be experiencing issues or dissatisfaction leading to churn. Offering upgrades or replacements could reduce churn.

1. For each no actionable and statistically significant predictor variable, the information obtained can used as follows-
2. Occhmkr –

Positive and Non-actionable

This information can be provided to the marketing team so that they can get a better understanding about their customer base. With the help of this information, they can guide marketing strategies and communications targeted at homemakers.

1. Actvsubs –

Negative and Non-actionable

This information can help the Customer Support Teams in knowing how many Subscriptions are active. This knowledge can improve support services and client relations.

1. Uniqsubs –

Negative and Non-actionable

This data can be share with the product development teams. They can customize subscription plan and enhancement accordingly.