Akaike Information Criterion is calculated as AIC = -2 Log L + 2((*k*-1) + *s*), where *k* is the number of levels of the dependent variable and *s* is the number of predictors in the model. **AIC** is used for the comparison of nonnested models on the same sample. Ultimately, the model with the smallest **AIC** is considered the best, although the **AIC** value itself is not meaningful.

The method used for reduction of variables are 1) missing values. Any variable or factor having missing values for more than 50000 records are dropped.

2) Hypothesis t-test for comparing the difference between churners and non-churners for different variables: At 95% confidence interval, we checked whether there is significant difference between the means .

3) We checked for multicollinearity by putting the variables in the regression and getting the vif.

Variables having vif > 10 were dropped.

4) We dropped variables like area, customer\_id, ethnic, that didnot make sense in predicting whether he will be churner or not.

| **Model Fit Statistics** | | |
| --- | --- | --- |
| **Criterion** | **Intercept Only** | **Intercept and Covariates** |
| **AIC** | 62215.023 | 60569.150 |
| **SC** | 62223.735 | 61579.814 |
| **-2 Log L** | 62213.023 | 60337.150 |

Here you can see the fitted model with the intercepts and covariates is better than the model with just the response variable.

Schwarz Criterion is defined as - 2 Log L + ((*k*-1) + *s*)\*log(Σ*fi*), where *fi*'s are the frequency values of the *i*th observation, and *k* and *s are no of levels and no of predictors respectively*. **SC** penalizes for the number of predictors in the model and the smallest **SC** is most desirable and the value itself is not meaningful..

**-2 Log L** - This is negative two times the log-likelihood. The **-2 Log L** is used in hypothesis tests for nested models and the value in itself is not meaningful.

These are the binary logit regression estimates for the **Parameters** in the model. The logistic regression model models the log odds of a positive response (probability modeled is churn=1) as a linear combination the predictor variables. This is written as

| **Analysis of Maximum Likelihood Estimates** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** |  | **DF** | **Estimate** | **Standard Error** | **Wald Chi-Square** | **Pr > ChiSq** |
| **Intercept** |  | 1 | 0.3633 | 12.1590 | 0.0009 | 0.9762 |
| **actvsubs** |  | 1 | -0.1924 | 0.0259 | 55.1080 | <.0001 |
| **HHstatin** | **A** | 1 | -0.0514 | 0.0660 | 0.6075 | 0.4357 |
| **HHstatin** | **B** | 1 | -0.0535 | 0.0431 | 1.5373 | 0.2150 |
| **HHstatin** | **C** | 1 | -0.0441 | 0.0252 | 3.0626 | 0.0801 |
| **HHstatin** | **G** | 1 | 0.0527 | 0.0587 | 0.8083 | 0.3686 |
| **HHstatin** | **H** | 1 | 0.1333 | 0.0660 | 4.0710 | 0.0436 |
| **adults** |  | 1 | 0.0256 | 0.00965 | 7.0186 | 0.0081 |
| **age1** |  | 1 | -0.00653 | 0.001000 | 42.6216 | <.0001 |
| **age2** |  | 1 | -0.00138 | 0.000638 | 4.6962 | 0.0302 |
| **asl\_flag** | **N** | 1 | 0.1403 | 0.0257 | 29.8726 | <.0001 |
| **blck\_vce\_Mean** |  | 1 | 0.00172 | 0.00122 | 2.0026 | 0.1570 |
| **crclscod** | **A** | 1 | 0.5452 | 12.1588 | 0.0020 | 0.9642 |
| **crclscod** | **A2** | 1 | 0.8916 | 12.1591 | 0.0054 | 0.9415 |
| **crclscod** | **A3** | 1 | -10.2632 | 265.8 | 0.0015 | 0.9692 |
| **crclscod** | **AA** | 1 | 0.6347 | 12.1588 | 0.0027 | 0.9584 |
| **crclscod** | **B** | 1 | 0.5829 | 12.1589 | 0.0023 | 0.9618 |
| **crclscod** | **B2** | 1 | 0.7110 | 12.1629 | 0.0034 | 0.9534 |
| **crclscod** | **BA** | 1 | 0.6213 | 12.1588 | 0.0026 | 0.9592 |
| **crclscod** | **C** | 1 | 0.4783 | 12.1590 | 0.0015 | 0.9686 |
| **crclscod** | **C2** | 1 | 0.3762 | 12.1610 | 0.0010 | 0.9753 |
| **crclscod** | **C5** | 1 | -0.0664 | 12.1670 | 0.0000 | 0.9956 |
| **crclscod** | **CA** | 1 | 0.6002 | 12.1588 | 0.0024 | 0.9606 |
| **crclscod** | **CC** | 1 | 0.5658 | 12.1727 | 0.0022 | 0.9629 |
| **crclscod** | **CY** | 1 | 0.0968 | 12.1610 | 0.0001 | 0.9937 |
| **crclscod** | **D** | 1 | 0.2841 | 12.1608 | 0.0005 | 0.9814 |
| **crclscod** | **D2** | 1 | -10.3739 | 265.8 | 0.0015 | 0.9689 |
| **crclscod** | **D4** | 1 | 0.0493 | 12.1623 | 0.0000 | 0.9968 |
| **crclscod** | **D5** | 1 | -1.5792 | 12.1806 | 0.0168 | 0.8968 |
| **crclscod** | **DA** | 1 | 0.4089 | 12.1590 | 0.0011 | 0.9732 |
| **crclscod** | **E** | 1 | 0.2879 | 12.1598 | 0.0006 | 0.9811 |
| **crclscod** | **E2** | 1 | -0.6993 | 12.1852 | 0.0033 | 0.9542 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **crclscod** | **E4** | 1 | 0.1750 | 12.1599 | 0.0002 | 0.9885 |
| **crclscod** | **EA** | 1 | 0.3733 | 12.1589 | 0.0009 | 0.9755 |
| **crclscod** | **EC** | 1 | 0.8454 | 12.2385 | 0.0048 | 0.9449 |
| **crclscod** | **EF** | 1 | 0.7573 | 12.2411 | 0.0038 | 0.9507 |
| **crclscod** | **EM** | 1 | 0.9567 | 12.1662 | 0.0062 | 0.9373 |
| **crclscod** | **G** | 1 | 0.6956 | 12.1613 | 0.0033 | 0.9544 |
| **crclscod** | **GA** | 1 | 0.8449 | 12.1614 | 0.0048 | 0.9446 |
| **crclscod** | **GY** | 1 | 0.7291 | 12.1867 | 0.0036 | 0.9523 |
| **crclscod** | **H** | 1 | -10.2233 | 153.5 | 0.0044 | 0.9469 |
| **crclscod** | **I** | 1 | -0.2581 | 12.1624 | 0.0005 | 0.9831 |
| **crclscod** | **J** | 1 | 0.3541 | 12.1860 | 0.0008 | 0.9768 |
| **crclscod** | **JF** | 1 | 0.8910 | 12.1612 | 0.0054 | 0.9416 |
| **crclscod** | **K** | 1 | 1.9293 | 12.2086 | 0.0250 | 0.8744 |
| **crclscod** | **L** | 1 | -10.2984 | 265.8 | 0.0015 | 0.9691 |
| **crclscod** | **M** | 1 | 0.4319 | 12.1611 | 0.0013 | 0.9717 |
| **crclscod** | **O** | 1 | -0.2850 | 12.1860 | 0.0005 | 0.9813 |
| **crclscod** | **TP** | 1 | 11.5787 | 187.6 | 0.0038 | 0.9508 |
| **crclscod** | **U** | 1 | 0.2597 | 12.1600 | 0.0005 | 0.9830 |
| **crclscod** | **U1** | 1 | 0.2572 | 12.1728 | 0.0004 | 0.9831 |
| **crclscod** | **V** | 1 | 11.6968 | 265.8 | 0.0019 | 0.9649 |
| **crclscod** | **V1** | 1 | 0.1035 | 12.1653 | 0.0001 | 0.9932 |
| **crclscod** | **W** | 1 | 0.1244 | 12.1664 | 0.0001 | 0.9918 |
| **crclscod** | **Y** | 1 | 0.9543 | 12.1919 | 0.0061 | 0.9376 |
| **crclscod** | **Z** | 1 | 0.5310 | 12.1620 | 0.0019 | 0.9652 |
| **crclscod** | **Z1** | 1 | -0.0812 | 12.1893 | 0.0000 | 0.9947 |
| **crclscod** | **Z4** | 1 | 0.5443 | 12.1683 | 0.0020 | 0.9643 |
| **crclscod** | **Z5** | 1 | 0.5119 | 12.2380 | 0.0017 | 0.9666 |
| **crclscod** | **ZA** | 1 | 0.5715 | 12.1592 | 0.0022 | 0.9625 |
| **callwait\_Mean** |  | 1 | 0.00585 | 0.00393 | 2.2091 | 0.1372 |
| **callwait\_Range** |  | 1 | -0.00708 | 0.00467 | 2.2955 | 0.1297 |
| **car\_buy** | **New** | 1 | 0.00809 | 0.0106 | 0.5822 | 0.4454 |
| **creditcd** | **N** | 1 | -0.00509 | 0.0232 | 0.0481 | 0.8264 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **da\_Mean** |  | 1 | -0.00540 | 0.00988 | 0.2992 | 0.5844 |
| **da\_Range** |  | 1 | 0.00945 | 0.00696 | 1.8446 | 0.1744 |
| **dualband** | **N** | 1 | 0.0588 | 0.0235 | 6.2433 | 0.0125 |
| **dualband** | **T** | 1 | -0.0879 | 0.0342 | 6.6071 | 0.0102 |
| **dwlltype** | **M** | 1 | 0.00736 | 0.0128 | 0.3288 | 0.5663 |
| **forgntvl** |  | 1 | -0.00046 | 0.0343 | 0.0002 | 0.9893 |
| **hnd\_price** |  | 1 | -0.00252 | 0.000241 | 109.9236 | <.0001 |
| **hnd\_webcap** | **NA** | 1 | 0.1374 | 0.0225 | 37.2651 | <.0001 |
| **hnd\_webcap** | **WC** | 1 | 0.0380 | 0.0205 | 3.4356 | 0.0638 |
| **income** |  | 1 | -0.00707 | 0.00516 | 1.8746 | 0.1709 |
| **iwylis\_vce\_Mean** |  | 1 | -0.00041 | 0.00193 | 0.0444 | 0.8331 |
| **iwylis\_vce\_Range** |  | 1 | -0.00198 | 0.00209 | 0.8992 | 0.3430 |
| **kid0\_2** | **U** | 1 | -0.0296 | 0.0207 | 2.0471 | 0.1525 |
| **kid11\_15** | **U** | 1 | 0.0194 | 0.0157 | 1.5233 | 0.2171 |
| **kid16\_17** | **U** | 1 | -0.0725 | 0.0154 | 22.1713 | <.0001 |
| **kid3\_5** | **U** | 1 | -0.0132 | 0.0198 | 0.4414 | 0.5064 |
| **kid6\_10** | **U** | 1 | -0.0149 | 0.0157 | 0.9044 | 0.3416 |
| **lor** |  | 1 | -0.0188 | 0.00244 | 59.2346 | <.0001 |
| **marital** | **A** | 1 | -0.00153 | 0.0317 | 0.0023 | 0.9614 |
| **marital** | **B** | 1 | 0.00807 | 0.0346 | 0.0544 | 0.8156 |
| **marital** | **M** | 1 | -0.00312 | 0.0191 | 0.0266 | 0.8705 |
| **marital** | **S** | 1 | -0.0586 | 0.0213 | 7.5461 | 0.0060 |
| **models** |  | 1 | -0.0645 | 0.0261 | 6.0999 | 0.0135 |
| **months** |  | 1 | 0.000259 | 0.00151 | 0.0295 | 0.8636 |
| **mou\_Range** |  | 1 | 0.000615 | 0.000046 | 180.9599 | <.0001 |
| **mou\_cvce\_Range** |  | 1 | -0.00029 | 0.000122 | 5.5483 | 0.0185 |
| **mou\_opkv\_Range** |  | 1 | -0.00072 | 0.000142 | 25.5030 | <.0001 |
| **mou\_rvce\_Range** |  | 1 | 0.000576 | 0.000148 | 15.2131 | <.0001 |
| **mouiwylisv\_Mean** |  | 1 | -0.00079 | 0.000817 | 0.9318 | 0.3344 |
| **mouiwylisv\_Range** |  | 1 | -0.00047 | 0.000681 | 0.4802 | 0.4883 |
| **mouowylisv\_Mean** |  | 1 | -0.00101 | 0.000493 | 4.1692 | 0.0412 |
| **mouowylisv\_Range** |  | 1 | 0.000477 | 0.000552 | 0.7468 | 0.3875 |
| **mtrcycle** |  | 1 | 0.1411 | 0.0664 | 4.5210 | 0.0335 |
| **new\_cell** | **N** | 1 | 0.00791 | 0.0191 | 0.1724 | 0.6780 |
| **new\_cell** | **U** | 1 | 0.0102 | 0.0143 | 0.5036 | 0.4779 |
| **opk\_vce\_Range** |  | 1 | 0.000642 | 0.000357 | 3.2375 | 0.0720 |
| **ownrent** | **O** | 1 | -0.0557 | 0.0293 | 3.6053 | 0.0576 |
| **owylis\_vce\_Range** |  | 1 | 0.00123 | 0.000912 | 1.8212 | 0.1772 |
| **phones** |  | 1 | 0.0239 | 0.0168 | 2.0062 | 0.1567 |
| **prizm\_social\_one** | **C** | 1 | -0.0184 | 0.0215 | 0.7293 | 0.3931 |
| **prizm\_social\_one** | **R** | 1 | 0.1181 | 0.0342 | 11.9072 | 0.0006 |
| **prizm\_social\_one** | **S** | 1 | -0.0627 | 0.0172 | 13.2421 | 0.0003 |
| **prizm\_social\_one** | **T** | 1 | -0.00692 | 0.0213 | 0.1051 | 0.7458 |
| **refurb\_new** | **N** | 1 | -0.0431 | 0.0161 | 7.1544 | 0.0075 |
| **threeway\_Mean** |  | 1 | -0.0363 | 0.0178 | 4.1432 | 0.0418 |
| **threeway\_Range** |  | 1 | -0.0103 | 0.0127 | 0.6497 | 0.4202 |
| **totmrc\_Mean** |  | 1 | -0.00553 | 0.000499 | 122.8671 | <.0001 |
| **totmrc\_Range** |  | 1 | -0.00246 | 0.000515 | 22.7634 | <.0001 |
| **truck** |  | 1 | -0.0169 | 0.0229 | 0.5438 | 0.4609 |
| **unan\_dat\_Range** |  | 1 | -0.0201 | 0.0170 | 1.3886 | 0.2386 |
| **unan\_vce\_Range** |  | 1 | 0.000440 | 0.000410 | 1.1522 | 0.2831 |
| **uniqsubs** |  | 1 | 0.1731 | 0.0198 | 76.8359 | <.0001 |

| **Odds Ratio Estimates** | | | |
| --- | --- | --- | --- |
| **Effect** | **Point Estimate** | **95% Wald Confidence Limits** | |
| **Actvsubs** | 0.825 | 0.784 | 0.868 |
| **HHstatin A vs I** | 0.986 | 0.842 | 1.154 |
| **HHstatin B vs I** | 0.984 | 0.891 | 1.086 |
| **HHstatin C vs I** | 0.993 | 0.947 | 1.041 |
| **HHstatin G vs I** | 1.094 | 0.952 | 1.257 |
| **HHstatin H vs I** | 1.186 | 1.018 | 1.381 |
| **Adults** | 1.026 | 1.007 | 1.045 |
| **age1** | 0.993 | 0.992 | 0.995 |
| **age2** | 0.999 | 0.997 | 1.000 |
| **asl\_flag N vs Y** | 1.324 | 1.197 | 1.464 |
| **blck\_vce\_Mean** | 1.002 | 0.999 | 1.004 |
| **crclscod A vs ZY** | 0.718 | 0.275 | 1.872 |
| **crclscod A2 vs ZY** | 1.015 | 0.383 | 2.688 |
| **crclscod A3 vs ZY** | <0.001 | <0.001 | >999.999 |
| **crclscod AA vs ZY** | 0.785 | 0.301 | 2.048 |
| **crclscod B vs ZY** | 0.745 | 0.285 | 1.950 |
| **crclscod B2 vs ZY** | 0.847 | 0.268 | 2.675 |
| **crclscod BA vs ZY** | 0.775 | 0.296 | 2.023 |
| **crclscod C vs ZY** | 0.671 | 0.255 | 1.771 |
| **crclscod C2 vs ZY** | 0.606 | 0.209 | 1.762 |
| **crclscod C5 vs ZY** | 0.389 | 0.105 | 1.443 |
| **crclscod CA vs ZY** | 0.758 | 0.290 | 1.982 |
| **crclscod CC vs ZY** | 0.733 | 0.162 | 3.311 |
| **crclscod CY vs ZY** | 0.458 | 0.158 | 1.328 |
| **crclscod D vs ZY** | 0.553 | 0.193 | 1.587 |
| **crclscod D2 vs ZY** | <0.001 | <0.001 | >999.999 |
| **crclscod D4 vs ZY** | 0.437 | 0.142 | 1.345 |
| **crclscod D5 vs ZY** | 0.086 | 0.015 | 0.491 |
| **crclscod DA vs ZY** | 0.626 | 0.238 | 1.650 |
| **crclscod E vs ZY** | 0.555 | 0.202 | 1.523 |
| **crclscod E2 vs ZY** | 0.207 | 0.032 | 1.342 |
| **crclscod E4 vs ZY** | 0.496 | 0.180 | 1.362 |
| **scrclscod EA vs ZY** | 0.604 | 0.231 | 1.581 |
| **crclscod EC vs ZY** | 0.969 | 0.051 | 18.532 |
| **crclscod EF vs ZY** | 0.887 | 0.045 | 17.694 |
| **crclscod EM vs ZY** | 1.083 | 0.301 | 3.898 |
| **crclscod G vs ZY** | 0.834 | 0.284 | 2.449 |
| **crclscod GA vs ZY** | 0.969 | 0.328 | 2.862 |
| **crclscod GY vs ZY** | 0.863 | 0.128 | 5.800 |
| **crclscod H vs ZY** | <0.001 | <0.001 | >999.999 |
| **crclscod I vs ZY** | 0.321 | 0.104 | 0.993 |
| **crclscod J vs ZY** | 0.593 | 0.090 | 3.920 |
| **crclscod JF vs ZY** | 1.014 | 0.347 | 2.966 |
| **crclscod K vs ZY** | 2.865 | 0.259 | 31.676 |
| **crclscod L vs ZY** | <0.001 | <0.001 | >999.999 |
| **crclscod M vs ZY** | 0.641 | 0.220 | 1.870 |
| **crclscod O vs ZY** | 0.313 | 0.047 | 2.069 |
| **crclscod TP vs ZY** | >999.999 | <0.001 | >999.999 |
| **crclscod U vs ZY** | 0.540 | 0.195 | 1.491 |
| **crclscod U1 vs ZY** | 0.538 | 0.119 | 2.441 |
| **crclscod V vs ZY** | >999.999 | <0.001 | >999.999 |
| **crclscod V1 vs ZY** | 0.462 | 0.133 | 1.604 |
| **crclscod W vs ZY** | 0.471 | 0.130 | 1.708 |
| **crclscod Y vs ZY** | 1.081 | 0.141 | 8.266 |
| **crclscod Z vs ZY** | 0.708 | 0.233 | 2.149 |
| **crclscod Z1 vs ZY** | 0.384 | 0.053 | 2.762 |
| **crclscod Z4 vs ZY** | 0.717 | 0.184 | 2.788 |
| **crclscod Z5 vs ZY** | 0.694 | 0.037 | 13.177 |
| **crclscod ZA vs ZY** | 0.737 | 0.276 | 1.965 |
| **callwait\_Mean** | 1.006 | 0.998 | 1.014 |
| **callwait\_Range** | 0.993 | 0.984 | 1.002 |
| **car\_buy New vs UNKNOWN** | 1.016 | 0.975 | 1.059 |
| **creditcd N vs Y** | 0.990 | 0.904 | 1.084 |
| **da\_Mean** | 0.995 | 0.976 | 1.014 |
| **da\_Range** | 1.009 | 0.996 | 1.023 |
| **dualband N vs Y** | 1.030 | 0.978 | 1.085 |
| **dualband T vs Y** | 0.890 | 0.806 | 0.982 |
| **dwlltype M vs S** | 1.015 | 0.965 | 1.067 |
| **Forgntvl** | 1.000 | 0.935 | 1.069 |
| **hnd\_price** | 0.997 | 0.997 | 0.998 |
| **hnd\_webcap NA vs WCMB** | 1.367 | 1.264 | 1.478 |
| **hnd\_webcap WC vs WCMB** | 1.238 | 1.152 | 1.329 |
| **Income** | 0.993 | 0.983 | 1.003 |
| **iwylis\_vce\_Mean** | 1.000 | 0.996 | 1.003 |
| **iwylis\_vce\_Range** | 0.998 | 0.994 | 1.002 |
| **kid0\_2 U vs Y** | 0.943 | 0.869 | 1.022 |
| **kid11\_15 U vs Y** | 1.040 | 0.977 | 1.106 |
| **kid16\_17 U vs Y** | 0.865 | 0.814 | 0.919 |
| **kid3\_5 U vs Y** | 0.974 | 0.901 | 1.053 |
| **kid6\_10 U vs Y** | 0.971 | 0.913 | 1.032 |
| **Lor** | 0.981 | 0.977 | 0.986 |
| **marital A vs U** | 0.945 | 0.865 | 1.032 |
| **marital B vs U** | 0.954 | 0.868 | 1.048 |
| **marital M vs U** | 0.943 | 0.888 | 1.003 |
| **marital S vs U** | 0.892 | 0.835 | 0.954 |
| **Models** | 0.938 | 0.891 | 0.987 |
| **Months** | 1.000 | 0.997 | 1.003 |
| **mou\_Range** | 1.001 | 1.001 | 1.001 |
| **mou\_cvce\_Range** | 1.000 | 0.999 | 1.000 |
| **mou\_opkv\_Range** | 0.999 | 0.999 | 1.000 |
| **mou\_rvce\_Range** | 1.001 | 1.000 | 1.001 |
| **mouiwylisv\_Mean** | 0.999 | 0.998 | 1.001 |
| **mouiwylisv\_Range** | 1.000 | 0.998 | 1.001 |
| **mouowylisv\_Mean** | 0.999 | 0.998 | 1.000 |
| **mouowylisv\_Range** | 1.000 | 0.999 | 1.002 |
| **Mtrcycle** | 1.152 | 1.011 | 1.312 |
| **new\_cell N vs Y** | 1.026 | 0.961 | 1.096 |
| **new\_cell U vs Y** | 1.029 | 0.979 | 1.081 |
| **opk\_vce\_Range** | 1.001 | 1.000 | 1.001 |
| **ownrent O vs R** | 0.895 | 0.797 | 1.004 |
| **owylis\_vce\_Range** | 1.001 | 0.999 | 1.003 |
| **Phones** | 1.024 | 0.991 | 1.059 |
| **prizm\_social\_one C vs U** | 1.012 | 0.950 | 1.078 |
| **prizm\_social\_one R vs U** | 1.160 | 1.056 | 1.274 |
| **prizm\_social\_one S vs U** | 0.968 | 0.917 | 1.022 |
| **prizm\_social\_one T vs U** | 1.023 | 0.959 | 1.092 |
| **refurb\_new N vs R** | 0.917 | 0.861 | 0.977 |
| **threeway\_Mean** | 0.964 | 0.931 | 0.999 |
| **threeway\_Range** | 0.990 | 0.965 | 1.015 |
| **totmrc\_Mean** | 0.994 | 0.994 | 0.995 |
| **totmrc\_Range** | 0.998 | 0.997 | 0.999 |
| **Truck** | 0.983 | 0.940 | 1.028 |
| **unan\_dat\_Range** | 0.980 | 0.948 | 1.013 |
| **unan\_vce\_Range** | 1.000 | 1.000 | 1.001 |
| **Uniqsubs** | 1.189 | 1.144 | 1.236 |

| **Association of Predicted Probabilities and Observed Responses** | | | |
| --- | --- | --- | --- |
| **Percent Concordant** | 61.3 | **Somers' D** | 0.232 |
| **Percent Discordant** | 38.1 | **Gamma** | 0.233 |
| **Percent Tied** | 0.5 | **Tau-a** | 0.116 |
| **Pairs** | 503778698 | **c** | 0.616 |

The percent concordant is 61.3. Since the sample has 50 % churners and 50 % non-churners, the model is doing well in terms of increasing the accuracy.

This is maximum likelihood estimates for one of the variables. Interpreting the max likelihood ratio for mtrcycle variable,

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mtrcycle |  | 1 | 0.1411 | 0.0664 | 4.5210 | 0.0335 |

This is the estimated logistic regression coefficient comparing people with motorcycles to people with no motorcycles, given the other variables are held constant in the model. The difference in log-odds is expected to be 0.1411 units higher for people with mtrcycles as compared to people with no mtrcycles, while holding the other variables constant in the model.

Interpreting the odds ratio estimate for the following variable

|  |  |  |  |
| --- | --- | --- | --- |
| **Phones** | **1.024** | **0.991** | **1.059** |

We can interpret the odds ratio as follows: for a one unit change in the predictor variable phones, the odds ratio for a positive outcome (churn =1) is expected to change by 2.4 %, given the other variables in the model are held constant.

|  |  |  |  |
| --- | --- | --- | --- |
| **age1** | 0.993 | 0.992 | 0.995 |

We can interpret the odds ratio as follows: for a one unit change in the predictor variable age1, the odds ratio for a positive outcome is expected to decrease by 0.07 %, given the other variables in the model are held constant.

2) **The number of variables that helped in predicting the churn better are**

**We have considerd significant variables by Pr > ChiSq**

Actsubs: Number of active subs, age1: Age of 1st household member,age2: Age of 2nd  household member

hndprice: Handset Price kids16\_17: Kid 16- 17 years of age in HH

models: # Models Issued

3)

|  |
| --- |
| ***The FREQ Procedure*** |

| **churn** | **Frequency** | **Percent** | **Cumulative Frequency** | **Cumulative Percent** |
| --- | --- | --- | --- | --- |
| **0** | 12516 | 50.06 | 12516 | 50.06 |
| **1** | 12484 | 49.94 | 25000 | 100.00 |

We have scored the 25000 observations.

The parameters from the logistic regression to predict churn behavior of a new dataset is given in the table above. We see 50.06% have been scored as churners and 49.94% have been scored as non-churners.