Homework #4: Insurance Claim Prediction

Data 621 Business Analytics and Data Mining

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1 Data Exploration

The dataset of interest contains information about customers of an auto insurance company. The dataset has 8161 rows (each representing a customer) and 25 variables. There are 23 predictor variables and 2 response variables: `TARGET_FLAG`, a binary categorical variable representing whether each customer has been in an accident; and `TARGET_AMT`, a numerical variable indicating the cost of a crash that a customer was in. The class of variables read in from the dataset is presented below:

	Class	Levels
TARGET_FLAG	integer	-
TARGET_AMT	numeric	-
KIDSDRIV	integer	-
AGE	integer	-
HOMEKIDS	integer	-
YOJ	integer	-
INCOME	factor	6613
PARENT1	factor	2
HOME_VAL	factor	5107
MSTATUS	factor	2
SEX	factor	2
EDUCATION	factor	5
JOB	factor	9
TRAVTIME	integer	-
CAR_USE	factor	2
BLUEBOOK	factor	2789
TIF	integer	-
CAR_TYPE	factor	6
RED_CAR	factor	2
OLDCLAIM	factor	2857
CLM_FREQ	integer	-
REVOKED	factor	2
MVR_PTS	integer	-
CAR_AGE	integer	-
URBANICITY	factor	2

The very high number of levels for four of the variables (`INCOME`, `HOME_VAL`, `BLUEBOOK`, and `OLDCLAIM`) indicates that these variables are not in fact factors; investigation of the dataset indicates that these are dollar values interpreted as strings due to the presence of dollar signs and commas. The numerical values are extracted for these variables.

Additionally, there are 7 variables with only two levels. These are recast as binary variables as follows:

- `PARENT1`, `MSTATUS`, `RED_CAR`, and `REVOKED`: using 1 to indicate Yes
- `SEX`: using 1 to indicate Male
- `CAR_USE`: using 1 to indicate Commercial
- `URBANICITY`: using 1 to indicate Highly Urban/ Urban

Finally, there are three categorical variables – factors with more than two levels. Dummy variables are created for each of these, as follows:

- `EDUCATION`: 5 dummy variables
- `CAR_TYPE`: 6 dummy variables
- `JOB`: 8 dummy variables

A summary of each variable is presented below:

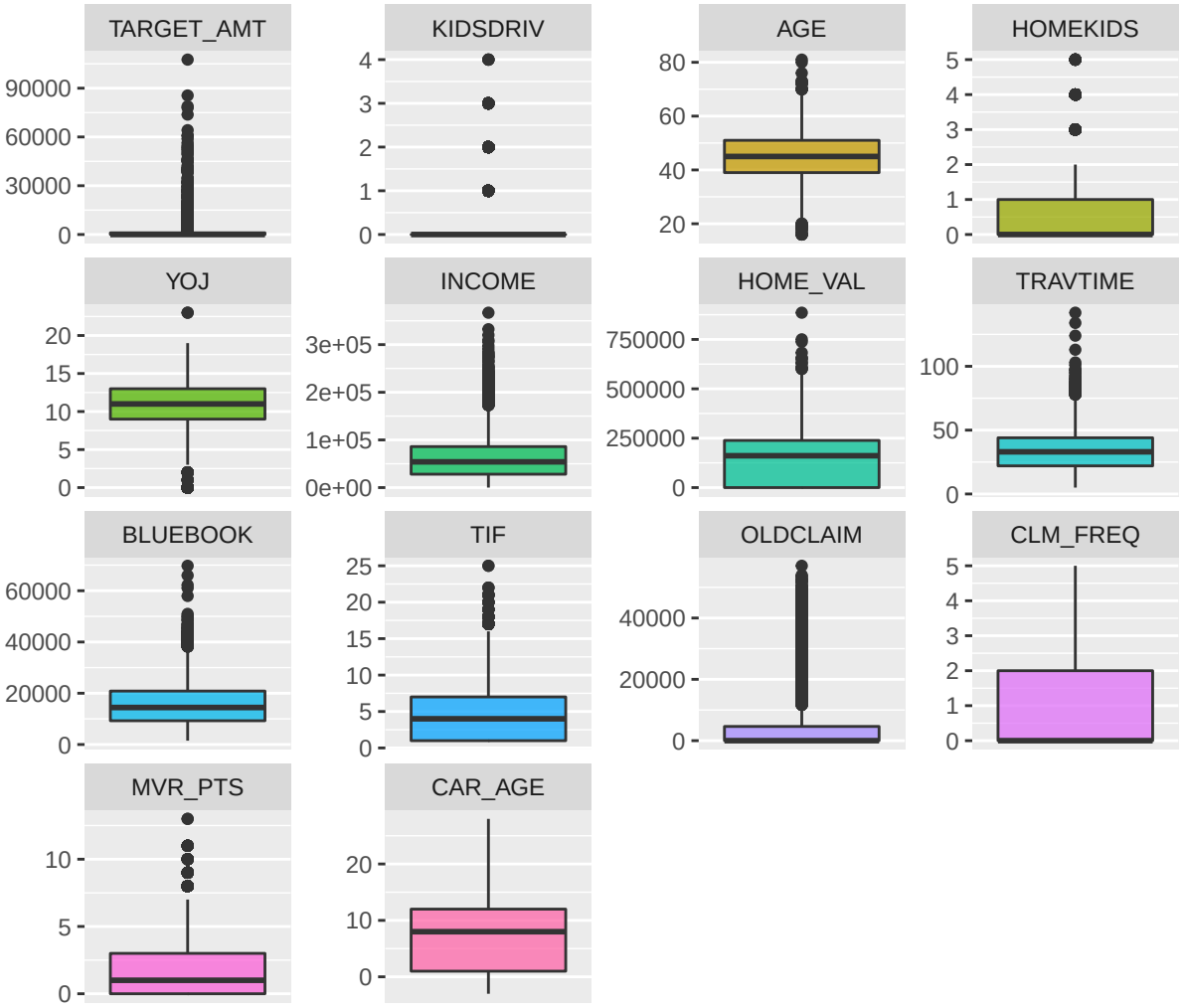
	MEAN	MEDIAN	IQR	SKEW	r_{FLAG}	r_{AMT}	NAs
TARGET_FLAG	0.26	0	1	1.07	1	0.54	0
TARGET_AMT	1504	0	1036	8.71	0.54	1	0
KIDSDRIV	0.17	0	0	3.35	0.09	0.05	0
AGE	44.79	45	12	-0.03	-0.11	-0.05	6
HOMEKIDS	0.72	0	1	1.34	0.11	0.06	0
YOJ	10.5	11	4	-1.2	-0.07	-0.02	454
INCOME	61898	54028	57889	1.19	-0.14	-0.06	445
PARENT1	0.13	0	0	2.17	0.16	0.1	0
HOME_VAL	154867	161160	238724	0.49	-0.18	-0.09	464
MSTATUS	0.6	1	1	-0.41	-0.13	-0.1	0
SEX	0.46	0	1	0.14	-0.02	0.01	0
TRAVTIME	33.49	33	22	0.45	0.05	0.03	0
CAR_USE	0.37	0	1	0.53	0.14	0.1	0
BLUEBOOK	15710	14440	11570	0.79	-0.11	0	0
TIF	5.35	4	6	0.89	-0.08	-0.04	0
RED_CAR	0.29	0	1	0.92	-0.02	0	0
OLDCLAIM	4037	0	4636	3.12	0.14	0.08	0
CLM_FREQ	0.8	0	2	1.21	0.22	0.12	0
REVOKED	0.12	0	0	2.3	0.15	0.06	0
MVR_PTS	1.7	1	3	1.35	0.23	0.14	0
CAR_AGE	8.33	8	11	0.28	-0.11	-0.06	510
URBANICITY	0.8	1	0	-1.46	0.22	0.12	0
HSDropout	0.15	0	0	1.99	0.06	0.04	0
HS	0.29	0	1	0.95	0.11	0.04	0
Bachelors	0.27	0	1	1.01	-0.05	-0.02	0
Masters	0.2	0	0	1.48	-0.09	-0.05	0
PhD	0.09	0	0	2.88	-0.06	-0.02	0
Minivan	0.26	0	1	1.08	-0.14	-0.08	0
Panel_Truck	0.08	0	0	3.03	0	0.04	0
Pickup	0.17	0	0	1.75	0.05	0.02	0
Sports_Car	0.11	0	0	2.47	0.06	0.03	0
Van	0.09	0	0	2.82	0	0.01	0
SUV	0.28	0	1	0.97	0.05	0.01	0
Blank_Job	0.06	0	0	3.55	-0.01	0.01	0
Professional	0.14	0	0	2.11	-0.04	0	0
Blue_Collar	0.22	0	0	1.33	0.1	0.07	0
Clerical	0.16	0	0	1.9	0.04	0	0
Doctor	0.03	0	0	5.49	-0.05	-0.03	0
Lawyer	0.1	0	0	2.62	-0.06	-0.03	0
Manager	0.12	0	0	2.32	-0.12	-0.07	0
Home_Maker	0.08	0	0	3.13	0.01	0	0
Student	0.09	0	0	2.92	0.07	0.02	0

From the table above, it is clear that there are four variables with missing values, with the proportion of values missing ranging from less than $< 0.1\%$ to roughly 6.2%; these missing values will need to either be imputed or excluded from the dataset before modeling. The variables exhibit varying levels of skewness, with a few extreme values.

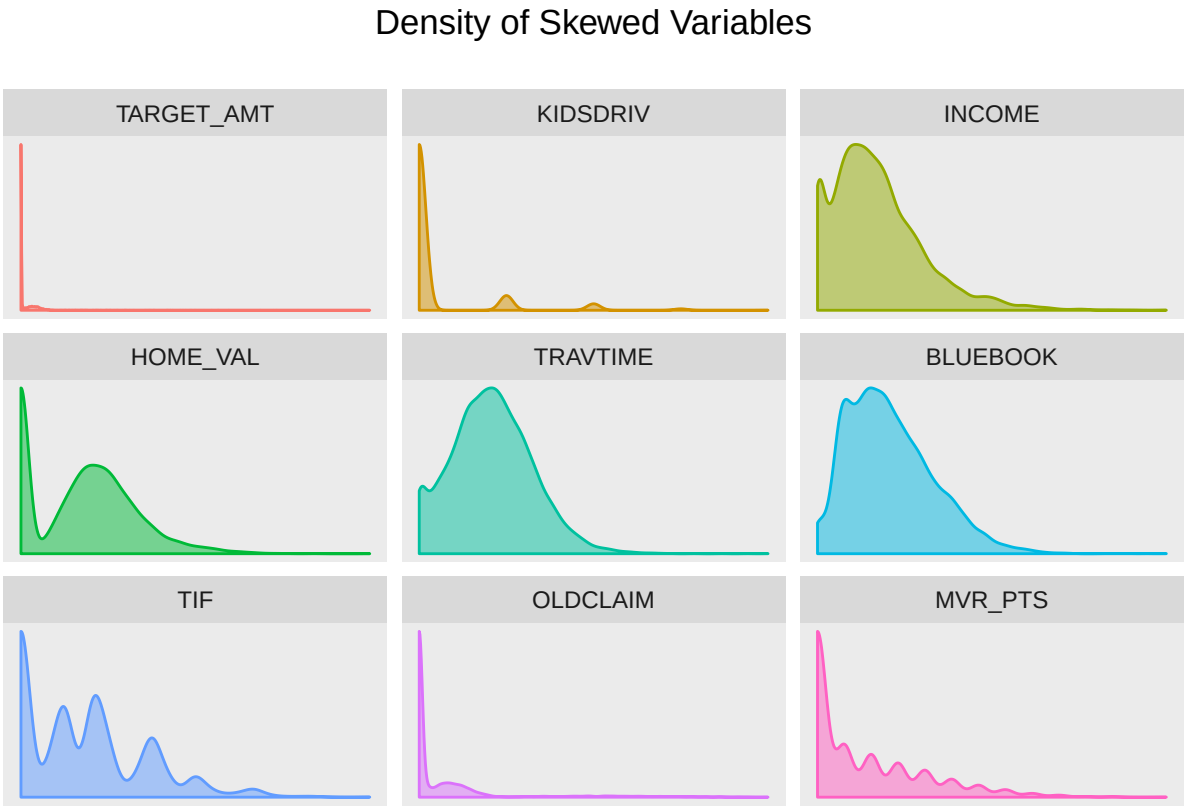
The large number of binary variables in the dataset makes graphical visualization of the distribution of all variables not particularly useful. The proportion of binary variables having a value of 0 or 1 is presented in the table below:

	0	1
TARGET_FLAG	0.74	0.26
PARENT1	0.87	0.13
MSTATUS	0.4	0.6
SEX	0.54	0.46
CAR_USE	0.63	0.37
RED_CAR	0.71	0.29
REVOKED	0.88	0.12
URBANICITY	0.2	0.8
HSDropout	0.85	0.15
HS	0.71	0.29
Bachelors	0.73	0.27
Masters	0.8	0.2
PhD	0.91	0.09
Minivan	0.74	0.26
Panel_Truck	0.92	0.08
Pickup	0.83	0.17
Sports_Car	0.89	0.11
Van	0.91	0.09
SUV	0.72	0.28
Blank_Job	0.94	0.06
Professional	0.86	0.14
Blue_Collar	0.78	0.22
Clerical	0.84	0.16
Doctor	0.97	0.03
Lawyer	0.9	0.1
Manager	0.88	0.12
Home_Maker	0.92	0.08
Student	0.91	0.09

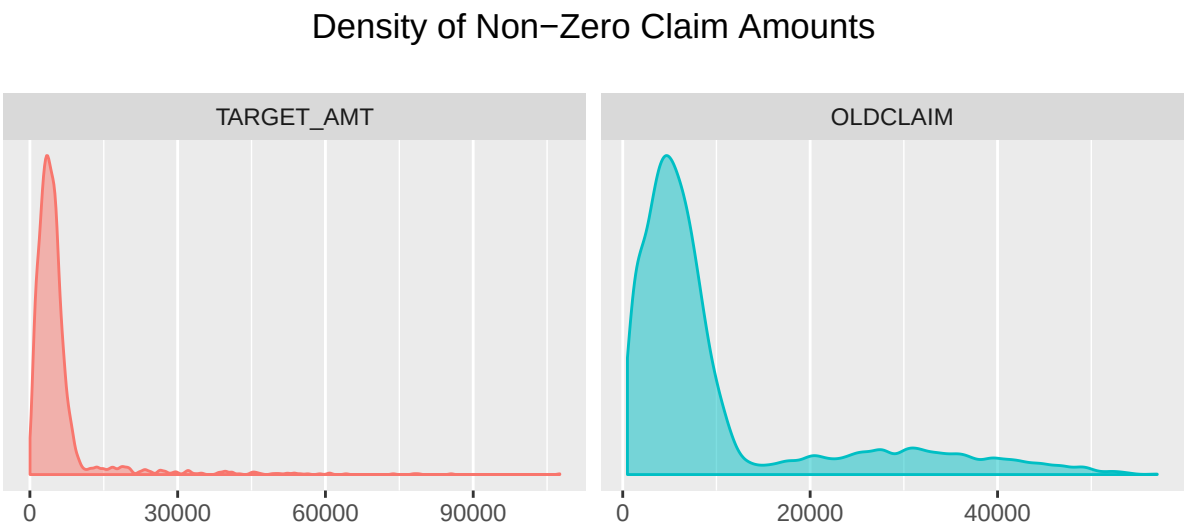
The remaining variables are vizualized below in boxplots:



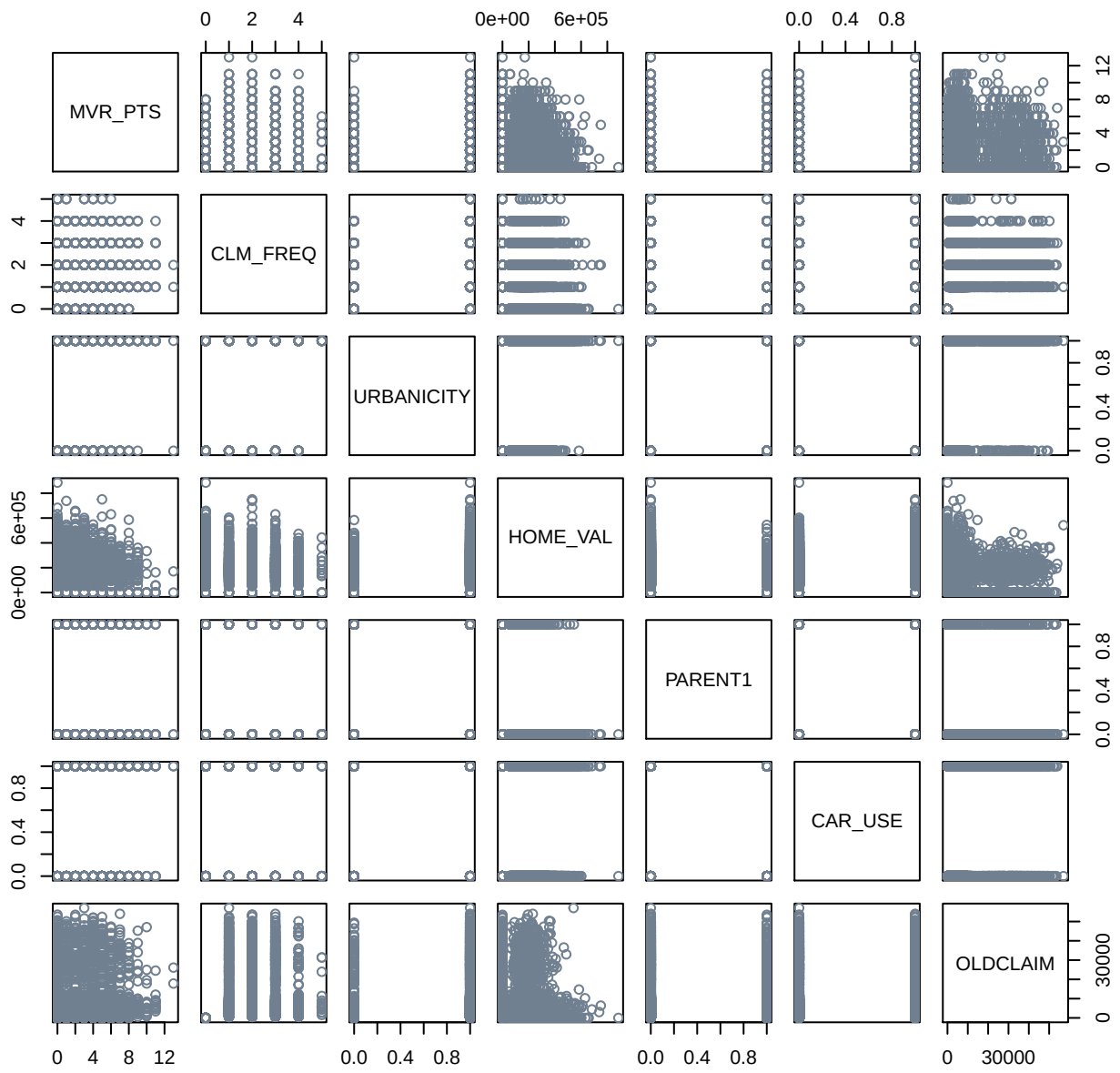
The boxplots illustrate the high skewness of the distributions of the predictors `KIDSDRIV`, `INCOME`, `HOME_VAL`, `TRAVTIME`, `BLUEBOOK`, `TIF`, `OLDCLAIM` and `MVR_PTS`. The target `TARGET_AMT` is also highly skewed – this makes sense, as this value is 0 for any customers without claims. Density plots of these variables are presented below:



Since `TARGET_AMT` and `OLDCLAIM` have such high concentrations at values of zero, separate plots for these two variables are created with values of zero removed:

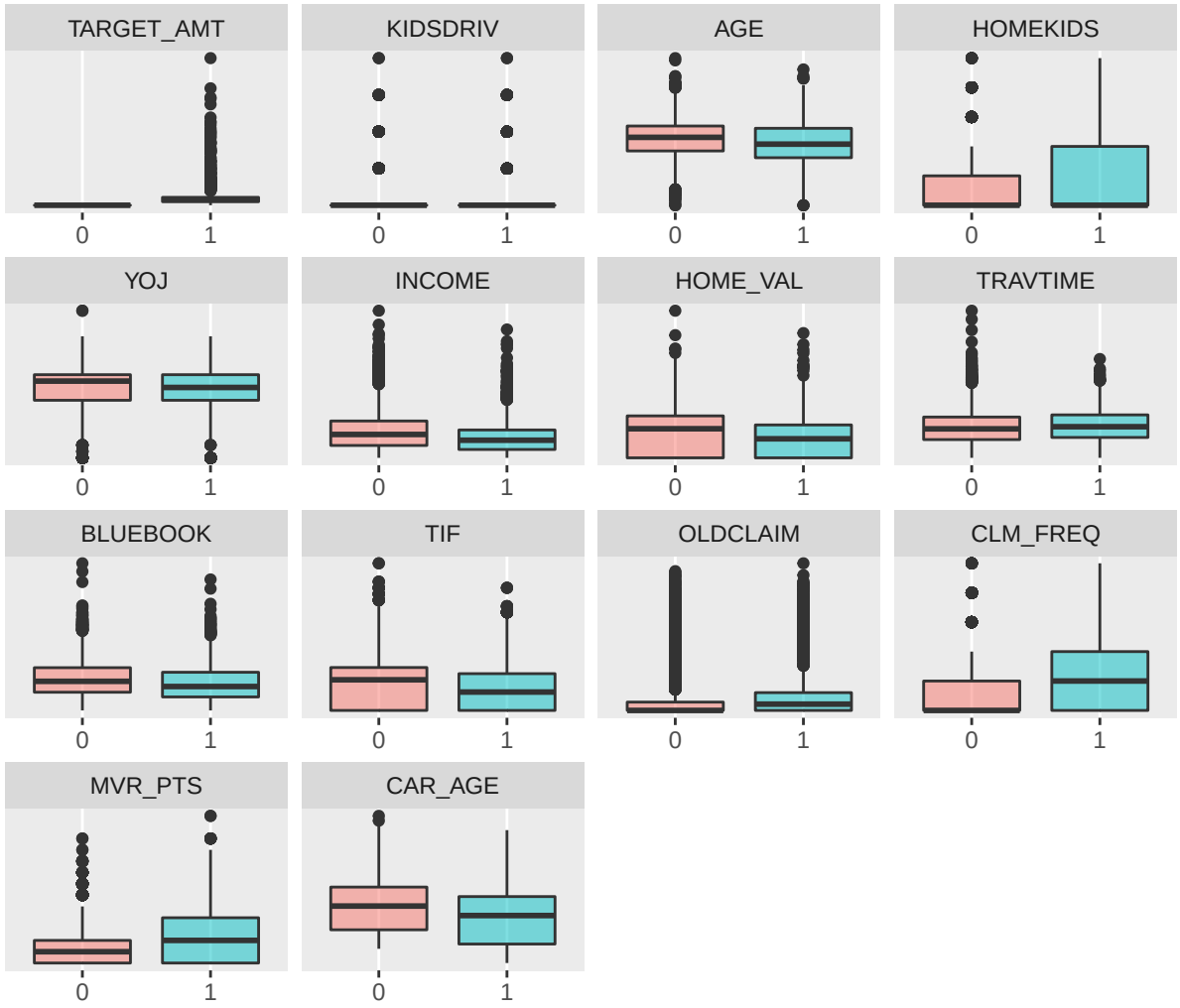


The 8 predictors with the highest correlation to `TARGET_FLAG` and the 8 predictors with the highest correlation to `TARGET_AMT` share 7 predictors. The correlation between these variables is investigated and plotted below:



There appears to be evidence of possible multicollinearity between `HOME_VAL` and `OLDCLAIM`.

Finally, boxplots are also prepared for non-binary variables split by `TARGET_FLAG`:



Interestingly, there are only a few variables with immediately visible difference in median value based on `TARGET_FLAG` values, while the range of predictor values for each flag value differs noticeably.

2 Data Preparation

As stated in Part 1, four predictor variables have missing values. Because these missing values represent, in many cases, a non-menial proportion of the dataset at large, they are imputed so the cases containing missing values can be included in modeling. Due to the skewness illustrated by some of the variables with missing data (`INCOME` and `HOME_VAL`), the median is used to avoid any bias introduced into the mean by the skewness of these variables' distribution. For the remaining two variables, the median is also used for imputation for consistency.

Additionally, there is one instance of a vehicle's `CAR_AGE` being -3. Since this variable represents the age of the car in years, this is a nonsensical value. This instance of this variable is removed before imputation.

A summary of the variables with imputation of median values is presented below:

	MEAN	MEDIAN	IQR	SKEW	r_{FLAG}	r_{AMT}	NAs
TARGET_FLAG	0.26	0	1	1.07	1	0.53	0
TARGET_AMT	1504	0	1036	8.71	0.53	1	0
KIDSDRIV	0.17	0	0	3.35	0.1	0.06	0
AGE	44.79	45	12	-0.03	-0.1	-0.04	0
HOMEKIDS	0.72	0	1	1.34	0.12	0.06	0
YOJ	10.53	11	4	-1.26	-0.07	-0.02	0
INCOME	61469	54028	53597	1.24	-0.14	-0.06	0
PARENT1	0.13	0	0	2.17	0.16	0.1	0
HOME_VAL	155225	161160	233352	0.49	-0.18	-0.08	0
MSTATUS	0.6	1	1	-0.41	-0.14	-0.09	0
SEX	0.46	0	1	0.14	-0.02	0.01	0
TRAVTIME	33.49	33	22	0.45	0.05	0.03	0
CAR_USE	0.37	0	1	0.53	0.14	0.1	0
BLUEBOOK	15710	14440	11570	0.79	-0.1	0	0
TIF	5.35	4	6	0.89	-0.08	-0.05	0
RED_CAR	0.29	0	1	0.92	-0.01	0.01	0
OLDCLAIM	4037	0	4636	3.12	0.14	0.07	0
CLM_FREQ	0.8	0	2	1.21	0.22	0.12	0
REVOKED	0.12	0	0	2.3	0.15	0.06	0
MVR_PTS	1.7	1	3	1.35	0.22	0.14	0
CAR_AGE	8.31	8	8	0.3	-0.1	-0.06	0
URBANICITY	0.8	1	0	-1.46	0.22	0.12	0
HSDropout	0.15	0	0	1.99	0.05	0.03	0
HS	0.29	0	1	0.95	0.11	0.04	0
Bachelors	0.27	0	1	1.01	-0.04	-0.02	0
Masters	0.2	0	0	1.48	-0.08	-0.04	0
PhD	0.09	0	0	2.88	-0.07	-0.02	0
Minivan	0.26	0	1	1.08	-0.14	-0.08	0
Panel_Truck	0.08	0	0	3.03	0	0.03	0
Pickup	0.17	0	0	1.75	0.06	0.02	0
Sports_Car	0.11	0	0	2.47	0.06	0.02	0
Van	0.09	0	0	2.82	0	0.02	0
SUV	0.28	0	1	0.97	0.05	0.01	0
Blank_Job	0.06	0	0	3.55	0	0.02	0
Professional	0.14	0	0	2.11	-0.04	0	0
Blue_Collar	0.22	0	0	1.33	0.1	0.06	0
Clerical	0.16	0	0	1.9	0.03	0.01	0
Doctor	0.03	0	0	5.49	-0.06	-0.03	0
Lawyer	0.1	0	0	2.62	-0.06	-0.03	0
Manager	0.12	0	0	2.32	-0.11	-0.06	0
Home_Maker	0.08	0	0	3.13	0.01	-0.01	0
Student	0.09	0	0	2.92	0.08	0.02	0

The creation of additional or combined predictors did not yield any predictors that would improve models, however due to the skewness of some predictors, log transformations were conducted.

In the table below, we can see the effect of each of the log transformation on the correlations to the two target variables. For many variables, the transformations do not improve the correlation, but the log transformations of `INCOME` and `HOME_VAL` may fit our models better.

	r_{FLAG}	$\log r_{FLAG}$	r_{AMT}	$\log r_{AMT}$
TARGET_FLAG	1	1	0.53	0.53
TARGET_AMT	0.53	1	1	0.58
KIDSDRIV	0.1	0.11	0.06	0.06
AGE	-0.1	-0.12	-0.04	-0.05
HOMEKIDS	0.12	0.13	0.06	0.07
YOJ	-0.07	-0.08	-0.02	-0.02
INCOME	-0.14	-0.11	-0.06	-0.03
PARENT1	0.16	0.16	0.1	0.1
HOME_VAL	-0.18	-0.15	-0.08	-0.07
MSTATUS	-0.14	-0.14	-0.09	-0.09
SEX	-0.02	-0.02	0.01	0.01
TRAVTIME	0.05	0.06	0.03	0.03
CAR_USE	0.14	0.14	0.1	0.1
BLUEBOOK	-0.1	-0.11	0	0
TIF	-0.08	-0.08	-0.05	-0.05
RED_CAR	-0.01	-0.01	0.01	0.01
OLDCLAIM	0.14	0.24	0.07	0.13
CLM_FREQ	0.22	0.24	0.12	0.13
REVOKED	0.15	0.15	0.06	0.06
MVR_PTS	0.22	0.17	0.14	0.11
CAR_AGE	-0.1	-0.09	-0.06	-0.05
URBANICITY	0.22	0.22	0.12	0.12
HSDropout	0.05	0.05	0.03	0.03
HS	0.11	0.11	0.04	0.04
Bachelors	-0.04	-0.04	-0.02	-0.02
Masters	-0.08	-0.08	-0.04	-0.04
PhD	-0.07	-0.07	-0.02	-0.02
Minivan	-0.14	-0.14	-0.08	-0.08
Panel_Truck	0	0	0.03	0.03
Pickup	0.06	0.06	0.02	0.02
Sports_Car	0.06	0.06	0.02	0.02
Van	0	0	0.02	0.02
SUV	0.05	0.05	0.01	0.01
Blank_Job	0	0	0.02	0.02
Professional	-0.04	-0.04	0	0
Blue_Collar	0.1	0.1	0.06	0.06
Clerical	0.03	0.03	0.01	0.01
Doctor	-0.06	-0.06	-0.03	-0.03
Lawyer	-0.06	-0.06	-0.03	-0.03
Manager	-0.11	-0.11	-0.06	-0.06
Home_Maker	0.01	0.01	-0.01	-0.01
Student	0.08	0.08	0.02	0.02

3 Model Creation

3.1 Multiple Linear Regression

The second response variable, `TARGET_AMT`, will have a value of 0 for cases that were not flagged as having a car accident (`TARGET_FLAG = 1`), and the cost of the accident otherwise. Since we are not dealing with a two-level categorical response, we will use multiple linear regression models for this variable. The training data has been subset to only include cases that were flagged for a car crash.

3.1.1 Full Model

We will start with the full model, including all 38 predictor variables. Median values were imputed into the variables with NAs.

	Estimate	Std. Error	t value	Pr(>|t|)
KIDSDRIV	-171.9	316.6	-0.5429	0.5873
AGE	18.35	21.24	0.8637	0.3879
HOMEKIDS	213.5	207.1	1.031	0.3028
YOJ	19.16	49.18	0.3896	0.6969
INCOME	-0.009014	0.006742	-1.337	0.1814
PARENT1	277.2	587.3	0.4721	0.6369
HOME_VAL	0.002198	0.00202	1.088	0.2767
MSTATUS	-803.6	493.5	-1.628	0.1036
SEX	1397	656.4	2.129	0.03338
TRAVTIME	0.7528	11.08	0.06794	0.9458
CAR_USE	438.4	521.6	0.8405	0.4008
BLUEBOOK	0.1245	0.03053	4.077	4.735e-05
TIF	-15.74	42.52	-0.3702	0.7112
RED_CAR	-193.3	496.5	-0.3894	0.697
OLDCLAIM	0.02502	0.02263	1.105	0.2691
CLM_FREQ	-115.4	158	-0.7305	0.4651
REVOKED	-1125	516.6	-2.177	0.02957
MVR_PTS	110.8	68.53	1.617	0.1061
CAR_AGE	-98.42	44.06	-2.233	0.02562
URBANICITY	97.78	756.2	0.1293	0.8971
HSDropout	-2396	1312	-1.827	0.06787
HS	-2792	1228	-2.273	0.02315
Bachelors	-2136	1141	-1.871	0.06142
Masters	-1202	954.1	-1.26	0.2077
Minivan	-902.5	666.8	-1.354	0.176
Panel_Truck	-1543	1173	-1.315	0.1885
Pickup	-958.9	679.5	-1.411	0.1583
Sports_Car	158.2	536.4	0.2949	0.7681
Van	-839.2	945.3	-0.8878	0.3748
Blank_Job	-114.7	1286	-0.0892	0.9289
Professional	946.2	865.8	1.093	0.2746
Blue_Collar	405.9	706.3	0.5747	0.5656
Clerical	193.7	730.3	0.2653	0.7908
Doctor	-2231	1948	-1.145	0.2521
Lawyer	212.5	1273	0.167	0.8674
Manager	-894.1	1064	-0.8405	0.4007
Home_Maker	-138.2	830.8	-0.1664	0.8679
(Intercept)	5680	1951	2.912	0.003633

(Dispersion parameter for gaussian family taken to be 59138671)

Null deviance:	1.290e+11 on 2152 degrees of freedom

Residual deviance:	1.251e+11 on 2115 degrees of freedom

Less than half (15) of the predictor coefficients are significant under a reasonable α , and 4 are between a 0.05 an 0.1 p-value. The coefficients vary in size, though all of them are quite small, 20 of the coefficients have negative values. Most of the slopes (negative or positive) appear to make sense in predicting the payout if the vehicle was in a crash, such as the value of the bluebook value of the car and vehicle type having a positive relationship with the response variable. 3 of the predictors coefficients were not defined, most likely due to the number of predictors, and some slight correlation with another variable. `PhD` for instance, has a higher correlation to the `Doctor` job variable.

3.1.2 Log-Transformed Full Model

As mentioned in the first section, the response variable is quite skewed. Our second multiple linear regression model uses a log transformation on the `TARGET_AMT` variable allows for a better fit of the full model.

	Estimate	Std. Error	t value	Pr(>|t|)
KIDSDRIV	-0.03288	0.03329	-0.9875	0.3235
AGE	0.001866	0.002234	0.8353	0.4036
HOMEKIDS	0.0231	0.02178	1.061	0.289
YOJ	-0.001023	0.005172	-0.1979	0.8432
INCOME	-1.326e-06	7.09e-07	-1.87	0.06161
PARENT1	0.02438	0.06176	0.3947	0.6931
HOME_VAL	1.478e-07	2.125e-07	0.6956	0.4867
MSTATUS	-0.09766	0.0519	-1.882	0.06001
SEX	0.09313	0.06904	1.349	0.1775
TRAVTIME	-0.0002604	0.001165	-0.2234	0.8232
CAR_USE	0.01333	0.05486	0.2429	0.8081
BLUEBOOK	1.197e-05	3.211e-06	3.729	0.0001973
TIF	-0.00197	0.004471	-0.4406	0.6596
RED_CAR	0.02164	0.05221	0.4146	0.6785
OLDCLAIM	4.45e-06	2.38e-06	1.869	0.06169
CLM_FREQ	-0.03631	0.01662	-2.185	0.029
REVOKED	-0.0953	0.05433	-1.754	0.07957
MVR_PTS	0.01478	0.007207	2.05	0.04045
CAR_AGE	-0.002596	0.004634	-0.5603	0.5753
URBANICITY	0.05696	0.07953	0.7162	0.474
HSDropout	-0.2487	0.138	-1.803	0.07153
HS	-0.24	0.1292	-1.858	0.06334
Bachelors	-0.2772	0.12	-2.31	0.021
Masters	-0.09599	0.1003	-0.9566	0.3389
Minivan	-0.09253	0.07012	-1.32	0.1871
Panel_Truck	-0.09075	0.1234	-0.7357	0.462
Pickup	-0.06364	0.07146	-0.8906	0.3732
Sports_Car	-0.03615	0.05641	-0.6409	0.5217
Van	-0.1044	0.09941	-1.05	0.2937
Blank_Job	-0.01979	0.1352	-0.1464	0.8837
Professional	0.08607	0.09106	0.9452	0.3446
Blue_Collar	0.04131	0.07428	0.5561	0.5782
Clerical	0.03384	0.0768	0.4407	0.6595
Doctor	-0.05833	0.2048	-0.2848	0.7758
Lawyer	-0.03244	0.1338	-0.2424	0.8085
Manager	-0.001392	0.1119	-0.01244	0.9901
Home_Maker	-0.07093	0.08737	-0.8118	0.417
(Intercept)	8.291	0.2052	40.41	4.016e-265

(Dispersion parameter for gaussian family taken to be 0.6540844)

Null deviance:	1421 on 2152 degrees of freedom

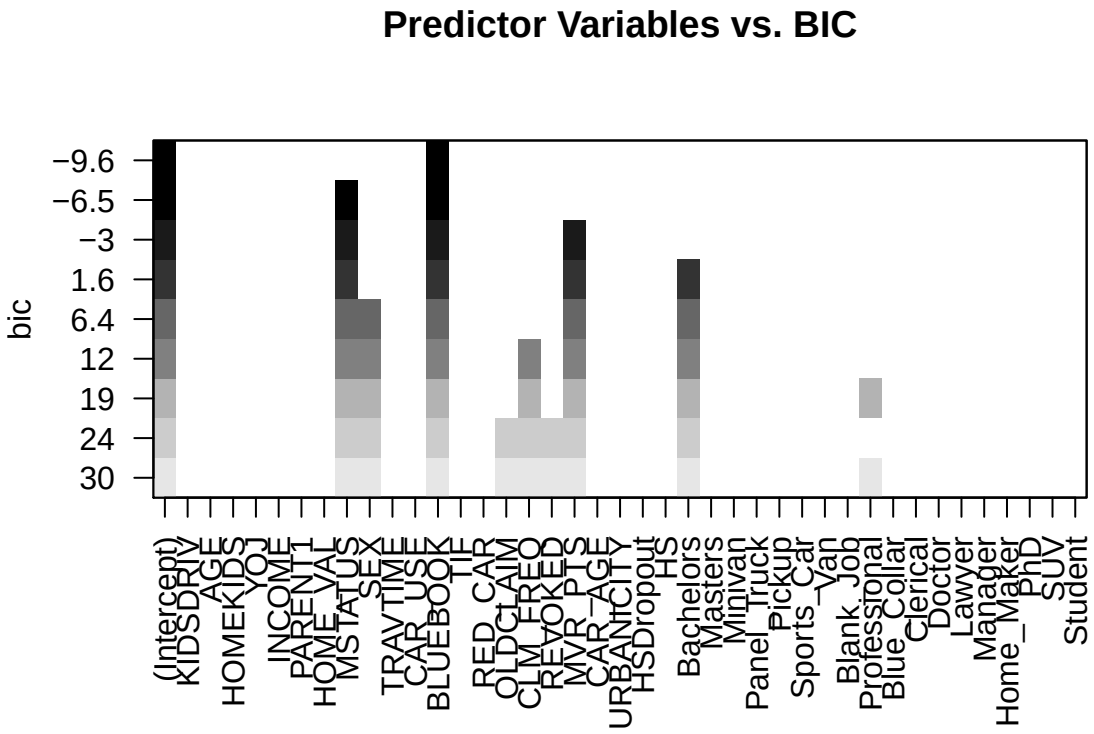
Residual deviance:	1383 on 2115 degrees of freedom

Now, the number of our predictors that are significant (under a .05 α) has increased, with 19 coefficients being highly significant. Our AIC has also decreased greatly from 44678 to 5235.6, indicating a better "goodness of fit".

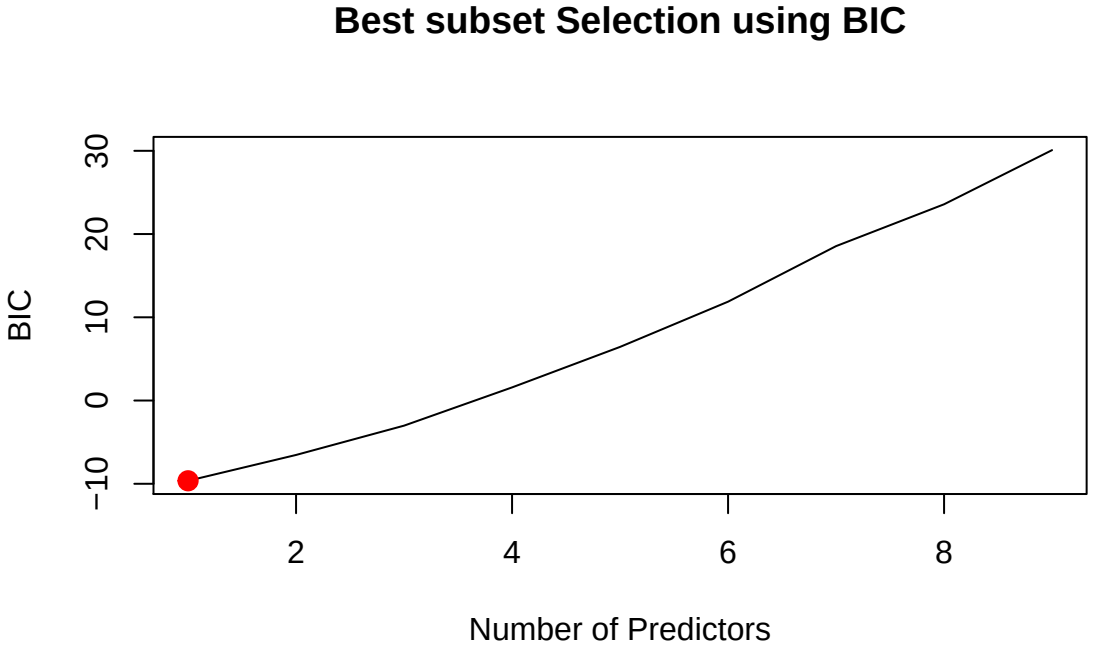
3.1.3 Bayesian Information Criteria

Our third linear regression model uses Bayesian Information Criteria (BIC) to determine the quantity of predictors, as well as specifically which ones to use in the model. For this model and going forward, we will continue to use the log transformation of the response variable as part of the model.

```
Reordering variables and trying again:
```




```
[1] 1
```



Examining the first plot, the model that results in the lowest "bic" includes the intercept and only one predictor.

Looking at the second plot, the best subset selection using BIC is the Bluebook value predictor. This is the only predictor chosen by the BIC method for all the different models. This makes sense since the biggest factor in determining the cost of a car accident is generally the value of the vehicle (disregarding personal injury or property damage). In the full model, Bluebook value had the most significant p-value, and a positive coefficient, given the higher the value of the vehicle, the higher the cost of the accident.

	Estimate	Std. Error	t value	Pr(>|t|)
BLUEBOOK	1.052e-05	2.099e-06	5.011	5.849e-07
(Intercept)	8.126	0.03462	234.7	0

(Dispersion parameter for gaussian family taken to be 0.6529404)

Null deviance:	1421 on 2152 degrees of freedom
Residual deviance:	1404 on 2151 degrees of freedom

Compared to our full models, the lone predictor model chosen by the BIC method results in a lower AIC value of 5196.2.

Since `BLUEBOOK` has a good amount of skew, we will apply a log transformation on the predictor to see if we can improve the fit of the model:

	Estimate	Std. Error	t value	Pr(>|t|)
log(BLUEBOOK)	0.1598	0.02626	6.085	1.377e-09
(Intercept)	6.778	0.2468	27.46	1.318e-142

(Dispersion parameter for gaussian family taken to be 0.6493857)

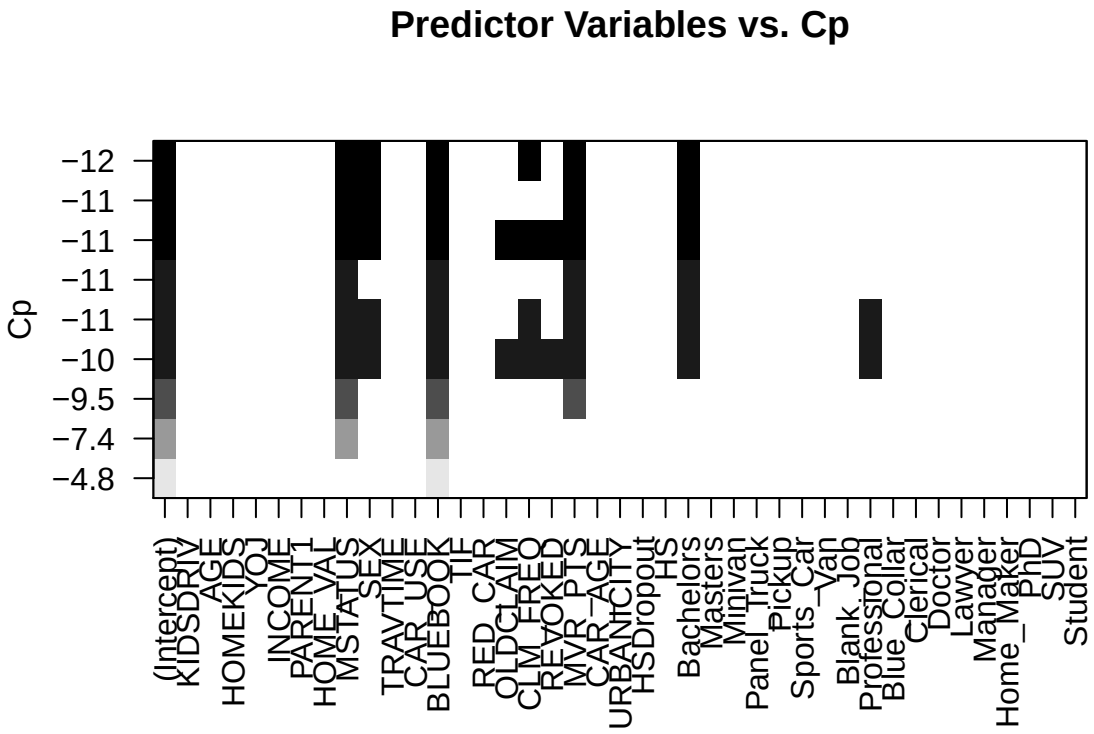
Null deviance:	1421 on 2152 degrees of freedom
Residual deviance:	1397 on 2151 degrees of freedom

The transformation of the bluebook value data makes for a better fit of our model, and the resulting AIC is 5184.4, the lowest value yet.

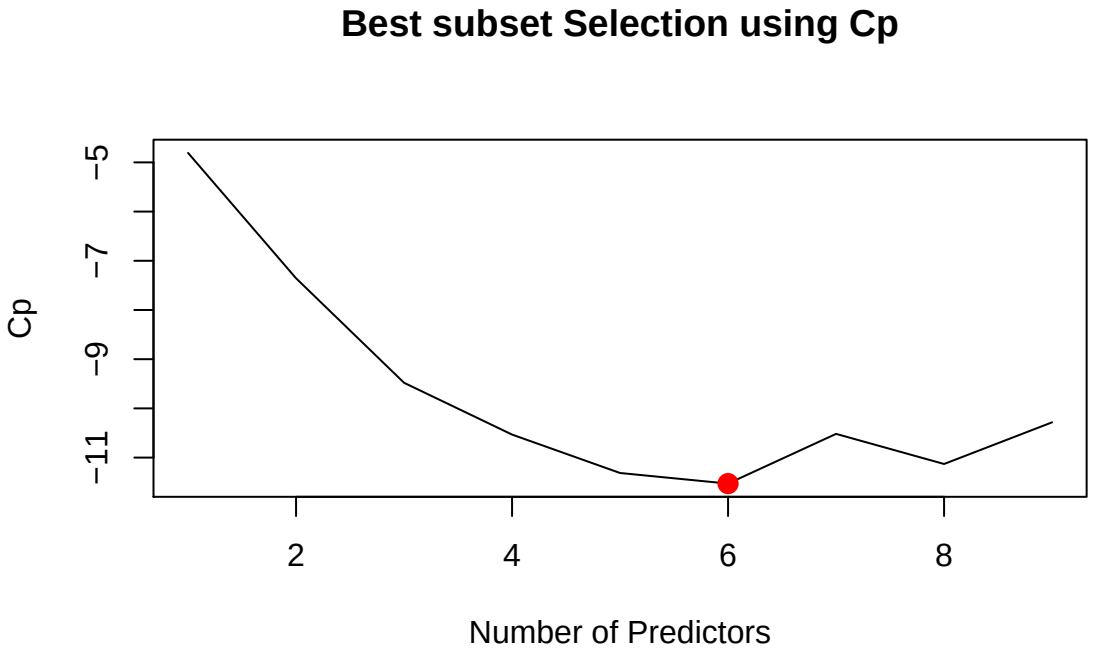
3.1.4 Mallow's C_p

Our next multivariate regression model is created utilizing Mallow's C_p, instead of BIC, to determine the number of predictors used for a best fit model.

`Reordering variables and trying again:`




```
[1] 6
```



Similar to the plots for BIC selection, the smaller C_p values correspond with the best-fit model. Using C_p, six predictors result in the lowest "Cp" value, which are `MSTATUS`, `SEX`, `BLUEBOOK`, `CLM_FREQ`, `MVR_PTS`, and `Bachelors`. These predictors selected by using the C_p method correspond with most of the statistically significant predictors from our log transformed response full model, with only the `SEX` predictor over the 0.05 threshold.

	Estimate	Std. Error	t value	Pr(>|t|)
MSTATUS	-0.07939	0.03487	-2.277	0.02291
SEX	0.05837	0.03507	1.665	0.09614
BLUEBOOK	1.038e-05	2.105e-06	4.932	8.773e-07
CLM_FREQ	-0.0218	0.01458	-1.495	0.1351
MVR_PTS	0.01711	0.007059	2.423	0.01547
Bachelors	-0.07107	0.0407	-1.746	0.08093

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	8.142	0.04731	172.1	0

(Dispersion parameter for gaussian family taken to be 0.6493582)

Null deviance:	1421 on 2152 degrees of freedom
Residual deviance:	1394 on 2146 degrees of freedom

As with the model created with BIC, the coefficient of the `BLUEBOOK` predictor is highly statistically significant. The other variables chosen by the C_p method vary in size and significance of their coefficients. `MSTATUS` and `MVR_PTS` are below the 0.05 α, and the remaining predictors are slightly above it. The relationship of marital status and sex to the cost of the accident may have something to do with the type of vehicles single vs. married people, and men vs. women choose to drive.

This model provides the second-lowest AIC of 5189.3, up slightly from the lone-predictor model chosen by BIC method.

Using the same thought-process as our BIC selection method, the most significant predictor, `BLUEBOOK` is log transformed, resulting in another slight reduction in AIC to 5177.5.

	Estimate	Std. Error	t value	Pr(>|t|)
MSTATUS	-0.07834	0.03478	-2.253	0.02438
SEX	0.05497	0.03497	1.572	0.1162
log(BLUEBOOK)	0.1586	0.02633	6.024	2.002e-09
CLM_FREQ	-0.02224	0.01454	-1.529	0.1264
MVR_PTS	0.01742	0.007041	2.474	0.01346
Bachelors	-0.07329	0.04059	-1.806	0.07111
(Intercept)	6.804	0.2488	27.35	1.63e-141

(Dispersion parameter for gaussian family taken to be 0.6457992)

Null deviance:	1421 on 2152 degrees of freedom
Residual deviance:	1386 on 2146 degrees of freedom

3.1.5 Model 5: Manual Selection

Lastly, we'll use some intuition to manually select predictors for our model based on what we know about driving habits, and what may logically affect the predicted costs of a car accident. Keeping with the theme of using the `BLUEBOOK` variable, we will use two of the other predictors that were significant in the full model, that may help in determining the cost of a car accident. `CLM_FREQ` and `MVR_PTS` are both good indicators of a persons driving habits, and more careless or reckless drivers may get into accidents with higher costs than a safer or more responsible driver would. Both of these variables appeared in the C_p selected model, but we will only use these and not the `SEX` or `MSTATUS` predictors for a more parsimonious model.

	Estimate	Std. Error	t value	Pr(>|t|)
log(BLUEBOOK)	0.1612	0.02624	6.145	9.497e-10
CLM_FREQ	-0.02301	0.01456	-1.58	0.1143
MVR_PTS	0.01743	0.007052	2.472	0.01353
(Intercept)	6.749	0.248	27.21	2.313e-140

(Dispersion parameter for gaussian family taken to be 0.6479137)

Null deviance:	1421 on 2152 degrees of freedom
Residual deviance:	1392 on 2149 degrees of freedom

The result is a model with a slightly higher AIC value of 5181.1, and two of the three predictors being below a 0.05 α. The

positive coefficients of BLUEBOOK and MVR_PTS make sense, and the negative slope on claim frequency (less claims, less costly driving habits) makes sense as well.

3.2 Binary Logistic Regression

Because we are attempting to predict two response variables, instead of doing this with one model, two separate models will be created to predict each response variable. First, we will create models for the TARGET_FLAG variable, since this will tell us whether a case was involved in a car accident or not. Binary logistic regression is used, as the flag variable is a two-level categorical response (0 or 1).

3.2.1 Full Model

We'll start with a full model, using all predictors and no transformations.

	Estimate	Std. Error	z value	Pr(>|z|)
KIDSDRIV	0.3862	0.06122	6.308	2.821e-10
AGE	-0.001015	0.00402	-0.2525	0.8007
HOMEKIDS	0.04965	0.03713	1.337	0.1811
YOJ	-0.01105	0.008582	-1.288	0.1977
INCOME	-3.423e-06	1.082e-06	-3.165	0.001551
PARENT1	0.382	0.1096	3.485	0.0004918
HOME_VAL	-1.306e-06	3.42e-07	-3.819	0.0001338
MSTATUS	-0.4938	0.08357	-5.909	3.45e-09
SEX	0.08251	0.112	0.7365	0.4614
TRAVTIME	0.01457	0.001883	7.736	1.028e-14
CAR_USE	0.7564	0.09172	8.247	1.626e-16
BLUEBOOK	-2.084e-05	5.263e-06	-3.959	7.52e-05
TIF	-0.05547	0.007344	-7.553	4.257e-14
RED_CAR	-0.009728	0.08636	-0.1126	0.9103
OLDCLAIM	-1.389e-05	3.91e-06	-3.554	0.00038
CLM_FREQ	0.1959	0.02855	6.864	6.687e-12
REVOKED	0.8874	0.09133	9.716	2.569e-22
MVR_PTS	0.1133	0.01361	8.324	8.53e-17
CAR_AGE	-0.0007196	0.007549	-0.09533	0.9241
URBANICITY	2.39	0.1128	21.18	1.43e-99
HSDropout	0.1677	0.214	0.7836	0.4333
HS	0.1853	0.1962	0.9442	0.3451
Bachelors	-0.2136	0.1797	-1.189	0.2345
Masters	-0.1227	0.1527	-0.8032	0.4218
Minivan	-0.7682	0.1113	-6.904	5.055e-12
Panel_Truck	-0.2074	0.2002	-1.036	0.3002
Pickup	-0.2142	0.1166	-1.838	0.06613
Sports_Car	0.257	0.09815	2.618	0.00884
Van	-0.1496	0.1589	-0.9416	0.3464
Blank_Job	-0.2161	0.2145	-1.007	0.3137
Professional	-0.05417	0.154	-0.3518	0.725
Blue_Collar	0.09451	0.1289	0.7333	0.4634
Clerical	0.1946	0.1315	1.48	0.1388
Doctor	-0.6619	0.3018	-2.193	0.02829
Lawyer	-0.1112	0.209	-0.5321	0.5947
Manager	-0.7733	0.1697	-4.557	5.182e-06
Home_Maker	0.01626	0.1507	0.1079	0.9141
(Intercept)	-2.847	0.3325	-8.562	1.112e-17

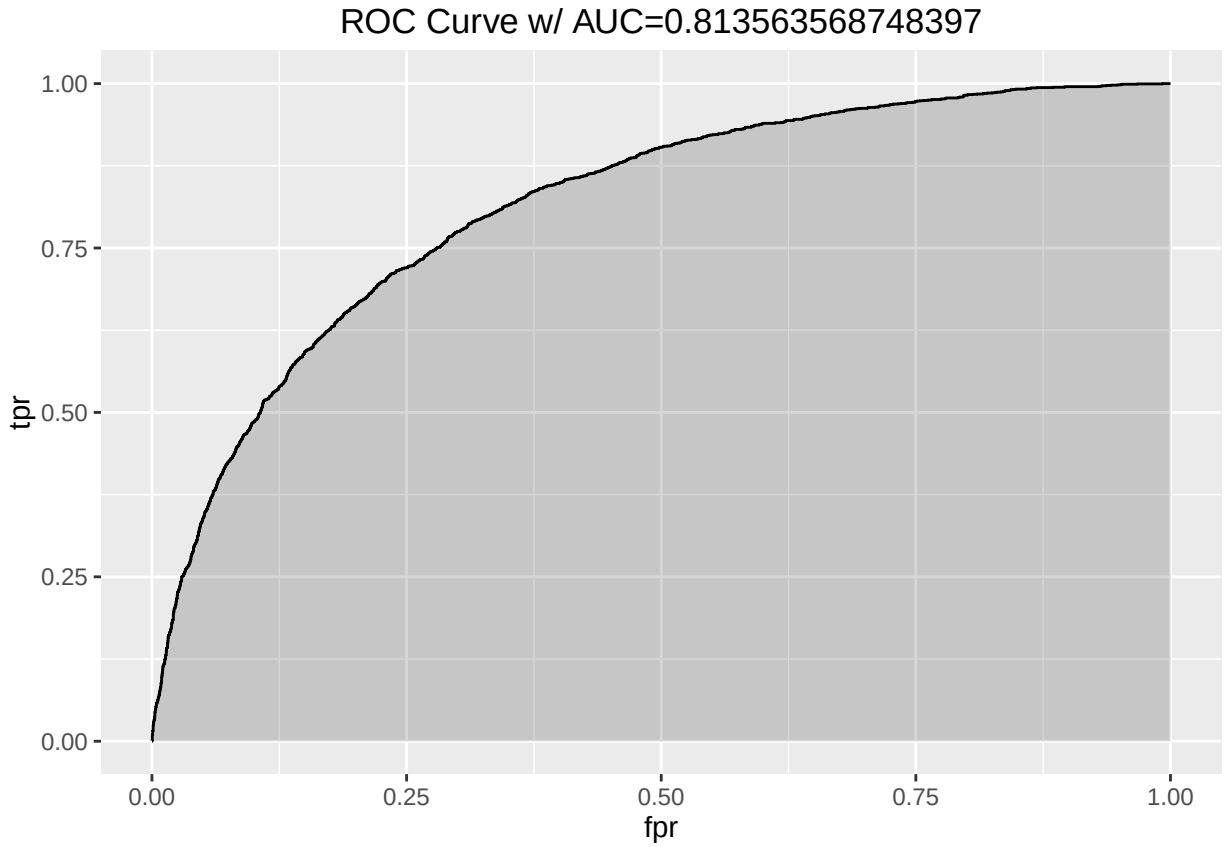
(Dispersion parameter for binomial family taken to be 1)

Null deviance:	9418 on 8160 degrees of freedom

Residual deviance:	7298 on 8123 degrees of freedom

```
Error in vif.default(glmflagfull): there are aliased coefficients in the model
```

```
Error in if (tail(stdout, 1) == "") {: argument is of length zero
```



Because we transformed some of the categorical predictors into two-level categorical variables, we have 38 predictors in model. The coefficients vary quite a bit, and we have 13 predictors that are not significant under any reasonable value of α. Many of the predictors with high statistical significance seem reasonable when considering the likelihood of an accident. Number of teen drivers, travel time, car use, claim frequency, driver record, and location all have positive slopes, and have significant p-values.

The full model has an area under the curve of 0.8136, and an accuracy of 0.7927

3.2.2 Reduced Model

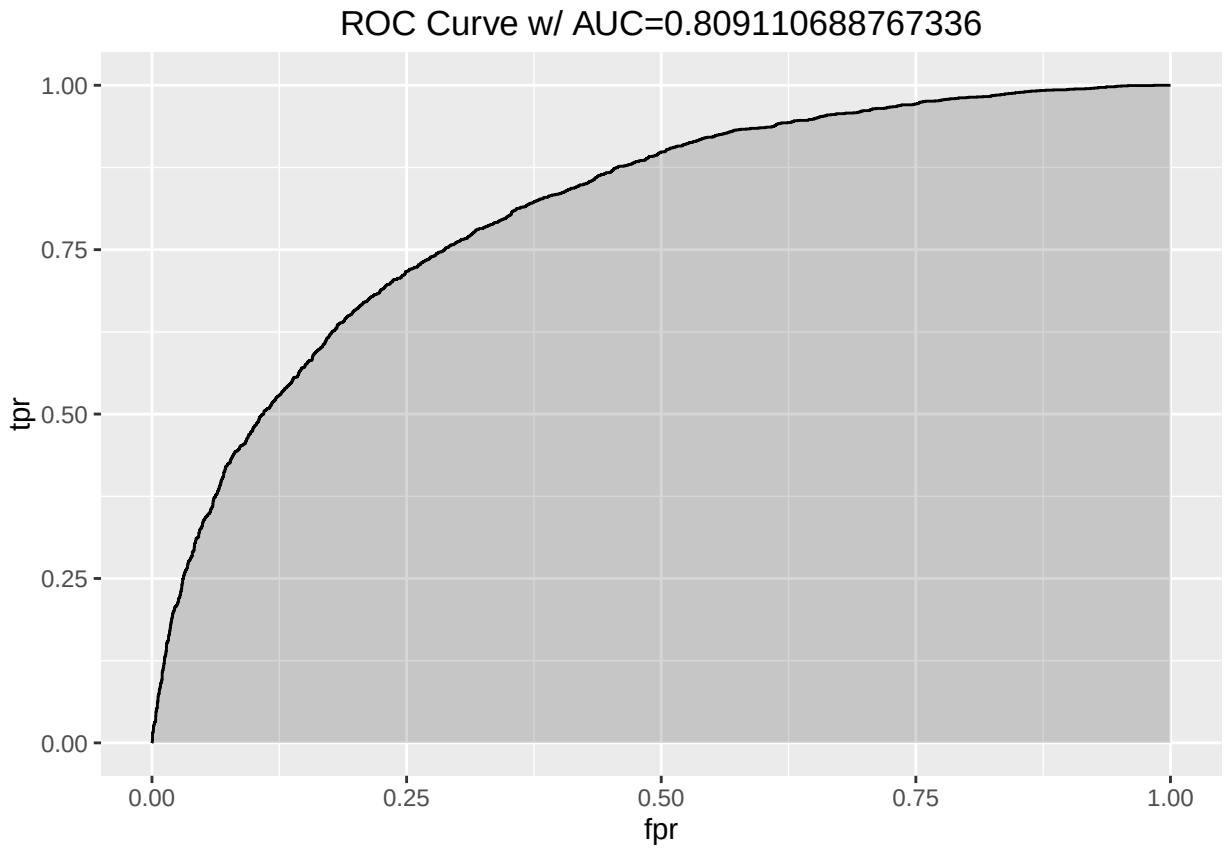
For our next Binary logistic regression model, predictors classified as non-significant have been removed from the full model. The remaining coefficients of predictors are now all significant with regards to their p-values. As with the full model, the predictors relating to the use of the car, performance of the driver, and location have the greatest effect.

	Estimate	Std. Error	z value	Pr(>|z|)
KIDSDRIV	0.4283	0.05478	7.82	5.297e-15
INCOME	-6.019e-06	8.966e-07	-6.714	1.898e-11
PARENT1	0.4929	0.09335	5.28	1.289e-07
HOME_VAL	-1.476e-06	3.312e-07	-4.456	8.339e-06
MSTATUS	-0.4198	0.07821	-5.367	7.993e-08
TRAVTIME	0.01426	0.001865	7.644	2.106e-14
CAR_USE	0.7541	0.06373	11.83	2.639e-32
BLUEBOOK	-2.584e-05	3.98e-06	-6.492	8.494e-11
TIF	-0.05476	0.007289	-7.513	5.764e-14

	Estimate	Std. Error	z value	Pr(>|z|)
OLDCLAIM	-1.368e-05	3.884e-06	-3.522	0.0004289
CLM_FREQ	0.1945	0.02831	6.871	6.385e-12
REVOKED	0.8825	0.09064	9.736	2.114e-22
MVR_PTS	0.1125	0.01348	8.347	6.977e-17
URBANICITY	2.317	0.1119	20.71	3.096e-95
Minivan	-0.6336	0.07513	-8.433	3.358e-17
Sports_Car	0.3073	0.09176	3.349	0.0008114
Doctor	-0.5315	0.221	-2.405	0.01618
Manager	-0.8527	0.1057	-8.07	7.017e-16
(Intercept)	-2.76	0.1553	-17.77	1.238e-70

(Dispersion parameter for binomial family taken to be 1)

Null deviance:	9418 on 8160 degrees of freedom
Residual deviance:	7361 on 8142 degrees of freedom

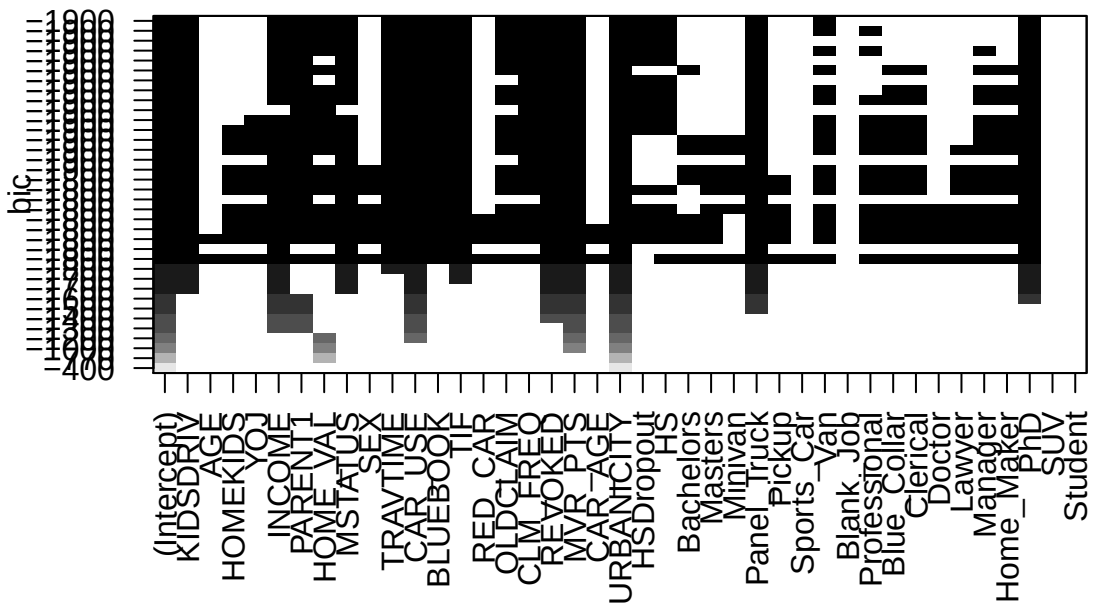


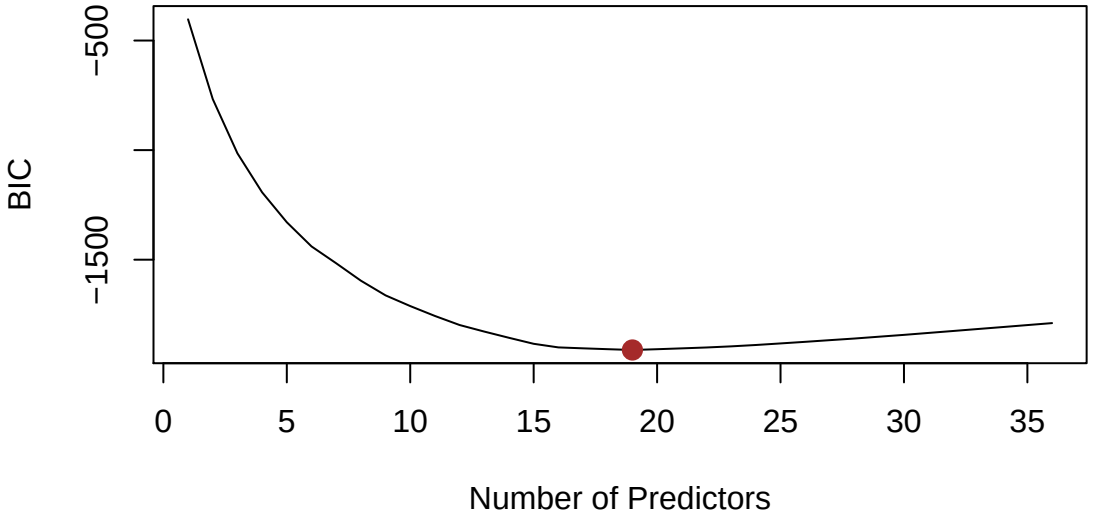
The reduced model has an area under the curve of 0.80911, and an accuracy of 0.7930

3.2.3 Best Subsets

Our last binary logistic regression model will be created using the `regsubsets` function from the `leaps` R package, which performs model selection for us. Bayesian Information Criterion is used for determining the number of predictors, with 19 determined to be the number resulting in the lowest BIC value.

```
Reordering variables and trying again:
```



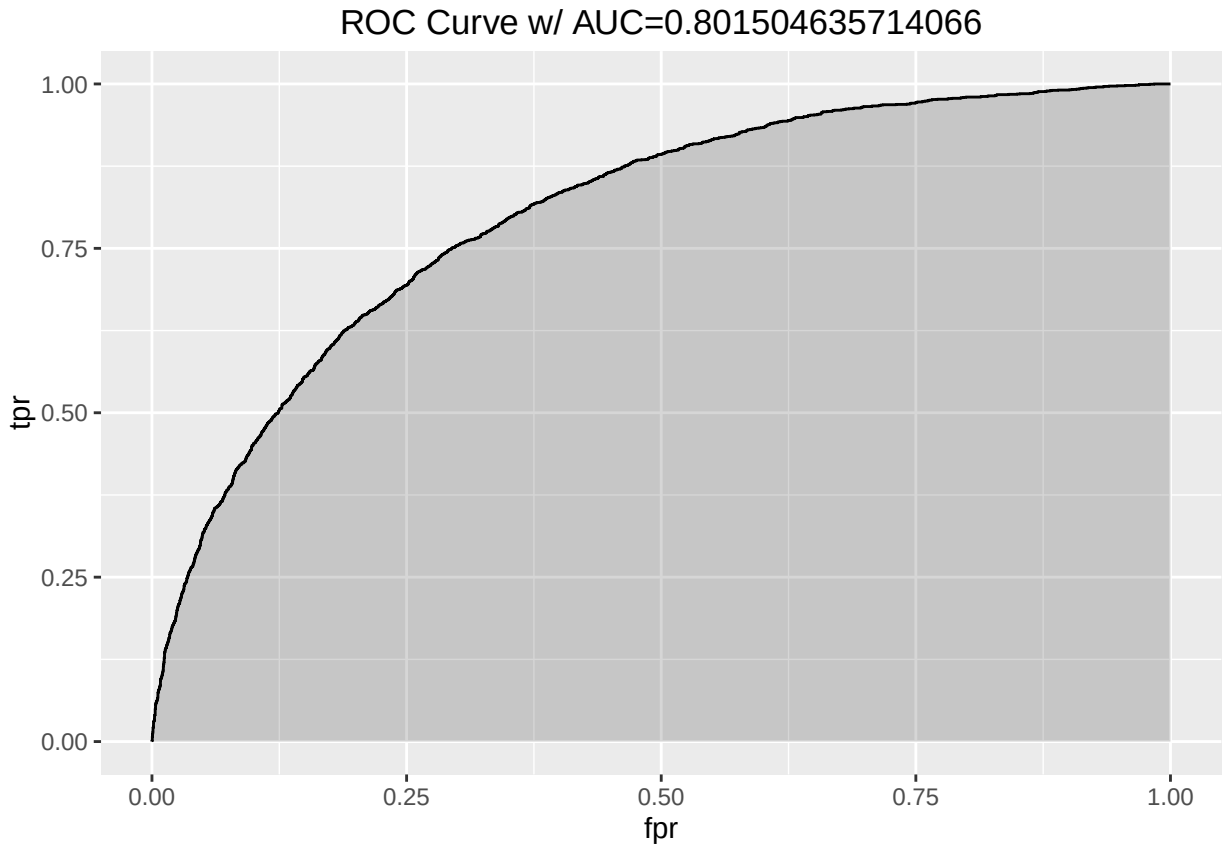


	Estimate	Std. Error	z value	Pr(>|z|)
KIDSDRIV	0.4068	0.05429	7.493	6.742e-14
INCOME	-5.011e-06	9.629e-07	-5.204	1.946e-07
PARENT1	0.485	0.09237	5.251	1.515e-07
HOME_VAL	-1.296e-06	3.284e-07	-3.947	7.9e-05
MSTATUS	-0.4433	0.07784	-5.695	1.236e-08
TRAVTIME	0.0148	0.001852	7.995	1.296e-15
CAR_USE	0.8168	0.06601	12.37	3.598e-35
BLUEBOOK	-3.196e-05	4.611e-06	-6.93	4.198e-12
TIF	-0.05354	0.007238	-7.398	1.387e-13
OLDCLAIM	-1.41e-05	3.848e-06	-3.663	0.0002491
CLM_FREQ	0.2016	0.02814	7.164	7.848e-13
REVOKED	0.9073	0.0898	10.1	5.324e-24
MVR_PTS	0.1218	0.01344	9.063	1.265e-19

	Estimate	Std. Error	z value	Pr(>|z|)
URBANICITY	2.277	0.1117	20.39	2.143e-92
HSDropout	0.5508	0.09131	6.032	1.617e-09
HS	0.5046	0.07275	6.936	4.029e-12
Panel_Truck	0.1874	0.1315	1.425	0.1541
Van	0.1751	0.1061	1.65	0.09894
PhD	0.01237	0.1201	0.103	0.918
(Intercept)	-3.253	0.1667	-19.51	8.554e-85

(Dispersion parameter for binomial family taken to be 1)

Null deviance:	9418 on 8160 degrees of freedom
Residual deviance:	7471 on 8141 degrees of freedom



The best subset model has an area under the curve of 0.8015, and an accuracy of 0.7825

```
Error in pander(confusionMatrix(train_flag$TARGET_FLAG, train_flag$target_bestsub, : could not find function "
```

```
Error in if (tail(stdout, 1) == "") {: argument is of length zero
```

4 Model Selection & Prediction

4.1 10-fold Cross Validation

The model using only the significant predictors as determined by AIC (Model 1) was selected as the best model for prediction of `TARGET_AMOUNT` in this data set. While the AIC value of this model was not the highest of the models tested, its mean cross-validation error indicates that it is has the best predictive value for unseen data. Additionally, it is a parsimonious model, and the simplicity lends itself to easier understanding of the model by other users.

4.1.0.0.1 Mean CV Error

MLR Model 1	60152520
MLR Model 2	62386094
MLR Model 3	62402465
MLR Model 4	62290747
MLR Model 5	62359927
Logistic Model 1	4.476
Logistic Model 2	4.518
Logistic Model 3	4.304

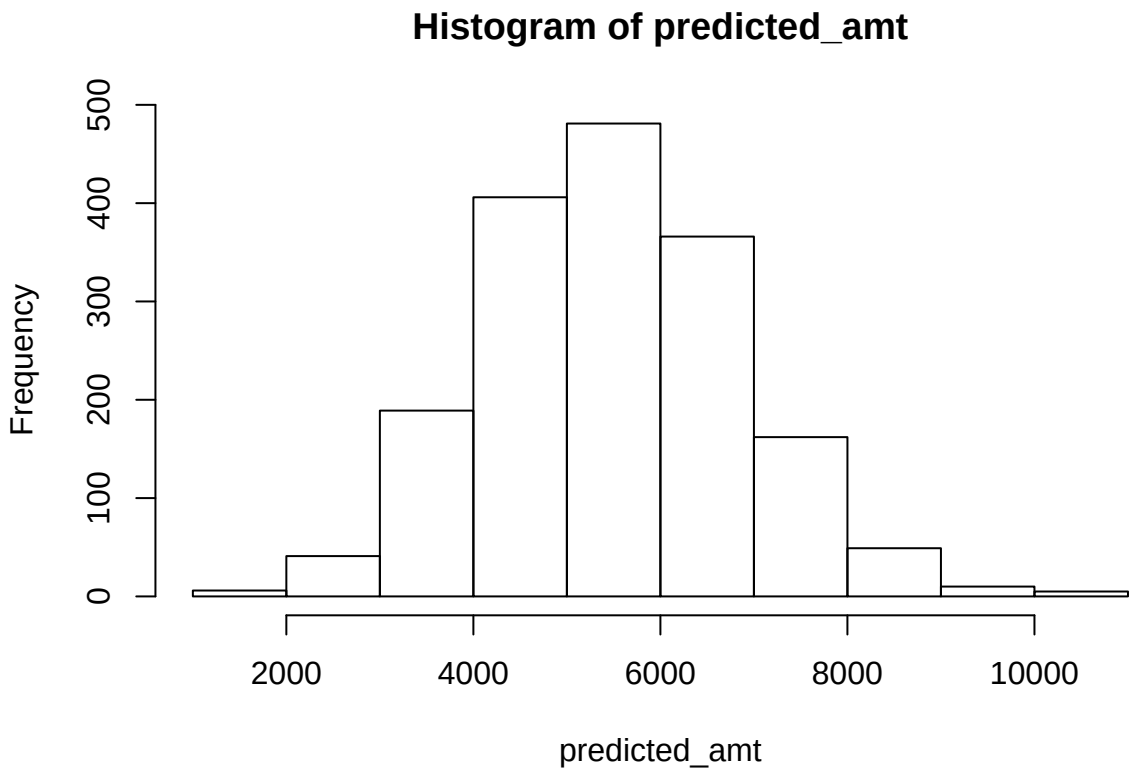
The linear model is applied to a test dataset containing response variables for 2141 cases. A table of the predicted team wins is presented below.

4.1.0.0.2 Predicted Classifications for Test Data, Compared to Training Data

0	1
1599	313

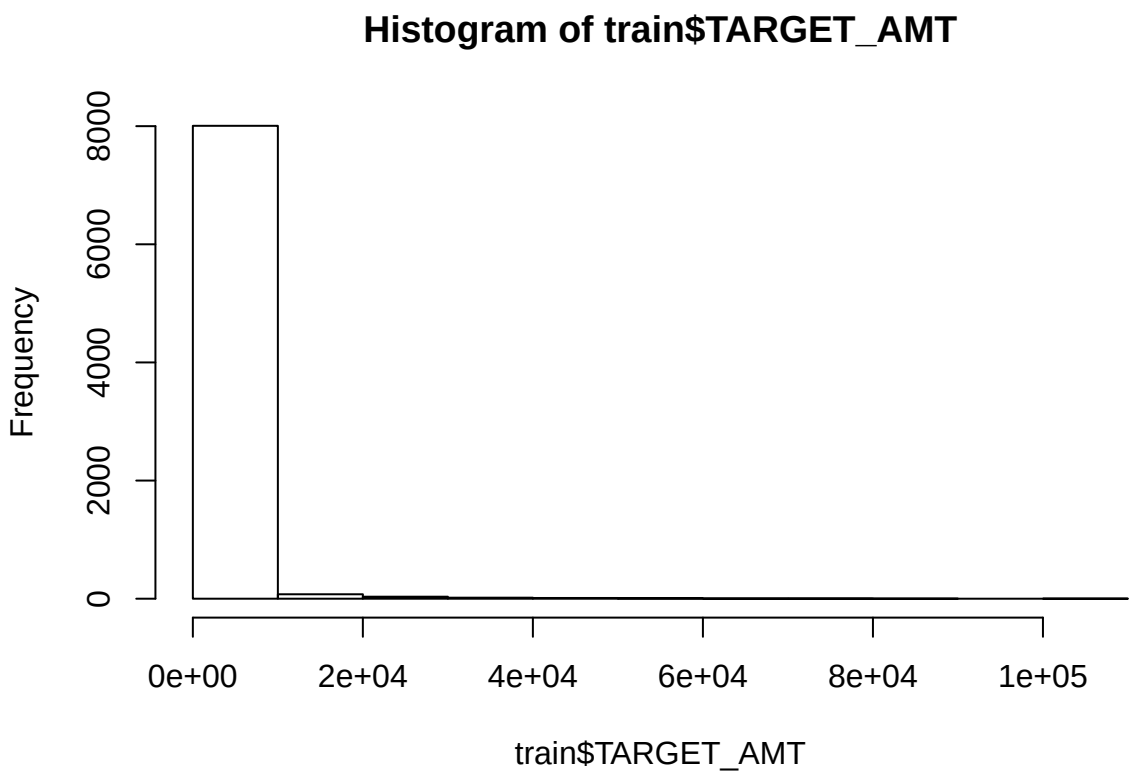
0	1
6008	2153

4.1.0.0.3 Predicted Amounts for Test Data, Compared to Training Data



- **breaks**: *1000*, *2000*, *3000*, *4000*, *5000*, *6000*, *7000*, *8000*, *9000*, *10000* and *11000*
- **counts**: *6*, *41*, *189*, *406*, *481*, *366*, *162*, *49*, *10* and *5*
- **density**: *3.499e-06*, *2.391e-05*, *0.0001102*, *0.0002367*, *0.0002805*, *0.0002134*, *9.446e-05*, *2.857e-05*, *5.831e-06* and *2.915e-06*
- **mids**: *1500*, *2500*, *3500*, *4500*, *5500*, *6500*, *7500*, *8500*, *9500* and *10500*

- **xname**: predicted_amt
- **equidist**: *TRUE*



- **breaks**: *0*, *10000*, *20000*, *30000*, *40000*, *50000*, *60000*, *70000*, *80000*, *90000*, *1e+05* and *110000*
- **counts**: *8006*, *75*, *34*, *17*, *12*, *9*, *3*, *3*, *1*, *0* and *1*
- **density**: *9.81e-05*, *9.19e-07*, *4.166e-07*, *2.083e-07*, *1.47e-07*, *1.103e-07*, *3.676e-08*, *3.676e-08*, *1.225e-08*, *0* and *1.225e-08*
- **mids**: *5000*, *15000*, *25000*, *35000*, *45000*, *55000*, *65000*, *75000*, *85000*, *95000* and *105000*
- **xname**: train$TARGET_AMT
- **equidist**: *TRUE*

Similar to the training dataset, the predictions for the test data set predictions are weighted more toward crime being below the median. It is important to note that Model 1 did not achieve the highest AIC on the training data but, given its cross-validation performance, we believe that Model 1 will produce the greatest generalizability of the models explored here for prediction of `TARGET_AMOUNT`. Likewise, given the Cross Validation results, we believe that Logistic Model 3 would provide the best generalizability for the classifcation task.

A comparison of the full sets of predictions for the evaluation dataset is available in Appendix A.

Appendix A: Index-wise Results from Predictive Model

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
3	0.2299	0	5717
9	0.4785	0	5524
10	0.1265	0	4503
18	0.2745	0	NA
21	0.3585	0	6005
30	NA	NA	NA
31	0.3362	0	5829
37	0.4575	0	NA
39	0.03772	0	5846
47	0.08512	0	6831
60	0.0454	0	NA
62	0.711	1	5688
63	NA	NA	NA
64	0.155	0	5937
68	0.0564	0	4818
75	NA	NA	NA
76	0.6276	1	NA
83	0.2066	0	6499
87	0.4715	0	4960
92	0.3028	0	4857
98	0.1526	0	5858
106	0.2729	0	3764
107	0.1046	0	5498
113	0.305	0	5290
120	0.2551	0	4297
123	0.3679	0	7523
125	0.4203	0	6072
126	0.2604	0	6602
128	0.1115	0	3721
129	0.1037	0	NA
131	0.1684	0	3287
135	0.3891	0	7185
141	0.1265	0	6345
147	0.1981	0	5941
148	0.1434	0	5933
151	0.03228	0	NA
156	0.2221	0	NA
157	0.151	0	6845
174	0.09574	0	NA
186	0.5354	1	5456
193	0.2922	0	4979
195	0.5302	1	5183
212	0.01951	0	6917
213	0.4097	0	6886
217	0.007808	0	5948
223	0.1942	0	4614
226	0.07365	0	4157
228	0.3156	0	6237
230	0.01214	0	3440
241	0.5801	1	4134
243	0.1466	0	5333
249	0.2083	0	6699
281	0.7915	1	5901
288	0.1664	0	5045
294	NA	NA	NA
295	0.2786	0	6992

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
300	0.3302	0	6014
302	0.3491	0	6343
303	0.1295	0	4839
308	0.5452	1	4352
319	0.01326	0	4863
320	0.07282	0	5158
324	0.409	0	5910
331	0.2785	0	4924
343	0.08062	0	5971
347	0.262	0	NA
348	0.8178	1	4580
350	0.7081	1	6971
357	0.1501	0	6450
358	0.03717	0	6732
360	NA	NA	NA
366	0.2893	0	5731
367	0.7016	1	5169
368	0.3267	0	4598
376	0.7039	1	4759
380	0.3274	0	3490
388	0.3139	0	5183
396	0.3736	0	5975
398	0.1981	0	5783
403	0.0443	0	4698
410	0.5396	1	4331
412	0.3081	0	6912
420	0.3034	0	5245
434	0.04565	0	6091
440	0.4826	0	4476
450	0.6142	1	7381
453	0.3592	0	5720
464	0.2498	0	5408
465	0.1017	0	4537
466	NA	NA	NA
473	0.1063	0	6602
476	0.06112	0	4076
478	NA	NA	NA
479	0.1486	0	5086
493	0.04667	0	6431
497	0.2285	0	6909
503	0.01529	0	6269
504	0.2125	0	6013
505	0.3508	0	6545
507	0.2584	0	3331
513	0.3616	0	4327
519	NA	NA	NA
521	0.6172	1	5271
522	0.6996	1	5741
545	NA	NA	NA
549	0.1079	0	5599
551	0.1815	0	6545
556	0.08834	0	4278
557	0.3432	0	6492
559	0.3096	0	4695
560	0.6505	1	4399
566	0.04631	0	3617
569	0.1906	0	4016
573	0.2677	0	2938

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
578	NA	NA	NA
579	0.02793	0	5126
582	0.01888	0	3782
596	0.5925	1	5386
598	0.6976	1	2138
599	0.1961	0	3980
602	0.2033	0	4165
605	0.803	1	4865
617	0.5971	1	4256
619	NA	NA	NA
630	0.227	0	5427
634	0.6112	1	5120
643	0.3907	0	4964
645	0.1676	0	5921
647	0.3602	0	3768
649	0.1246	0	4809
656	0.0818	0	NA
657	0.1073	0	NA
658	0.1793	0	NA
667	0.07184	0	4944
692	0.1725	0	5982
693	NA	NA	NA
698	0.7779	1	6230
699	0.5132	1	8366
700	0.04881	0	4957
704	0.101	0	NA
707	0.1084	0	3623
708	0.6346	1	5018
709	0.1803	0	6126
713	0.1272	0	4631
714	0.09191	0	6617
716	0.604	1	4182
718	0.1274	0	5666
722	NA	NA	NA
729	0.4816	0	8452
731	NA	NA	NA
733	0.6503	1	4956
746	NA	NA	NA
747	NA	NA	NA
748	0.4175	0	3149
753	0.1897	0	6525
757	0.5713	1	5630
763	NA	NA	NA
767	0.1267	0	5556
774	0.6157	1	3558
776	0.6023	1	4794
788	0.1629	0	6200
794	0.1684	0	4969
799	0.2102	0	5315
803	0.2676	0	2237
806	0.6539	1	7385
807	0.1995	0	5734
811	0.04843	0	6914
816	NA	NA	NA
818	0.3013	0	4443
819	0.1061	0	NA
831	0.1178	0	7401
835	0.5386	1	7133

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
837	NA	NA	NA
841	0.826	1	6469
846	0.2846	0	5956
856	0.3054	0	2917
861	NA	NA	NA
862	0.579	1	5662
863	0.5846	1	8139
865	0.6753	1	3994
871	0.6648	1	6278
879	0.1532	0	10043
880	0.1102	0	4642
881	0.2622	0	6030
885	0.2301	0	5742
887	0.2512	0	6093
892	0.0811	0	NA
898	0.1017	0	5056
900	0.2329	0	NA
904	0.3036	0	5185
906	0.5095	1	3916
910	0.6261	1	4745
912	NA	NA	NA
913	0.5013	1	3324
919	0.1174	0	6129
924	0.4228	0	4085
925	0.2741	0	5771
930	0.1957	0	6305
940	0.1756	0	5189
941	0.1202	0	6464
946	0.1635	0	NA
949	0.2732	0	4760
951	0.08371	0	5598
962	0.08464	0	5601
966	0.1027	0	3981
967	0.01183	0	5561
971	NA	NA	NA
981	0.02554	0	9474
982	0.09984	0	5827
983	0.09437	0	5093
984	0.03188	0	5411
989	0.2716	0	5811
990	0.5508	1	4327
992	0.4465	0	4645
995	0.0447	0	1829
996	0.2833	0	6685
998	0.4501	0	4631
1001	0.1027	0	4174
1007	0.1646	0	6549
1008	0.03318	0	6758
1016	0.05257	0	5633
1022	0.06743	0	6292
1027	0.5686	1	5976
1032	0.2939	0	4608
1033	0.2957	0	3937
1041	0.3579	0	4368
1065	0.7336	1	5883
1074	0.4697	0	3895
1075	0.3958	0	7191
1081	0.1002	0	7109

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
1094	0.0482	0	5757
1099	0.09574	0	NA
1105	0.5321	1	8015
1123	0.05724	0	8128
1135	0.005405	0	6587
1142	0.3156	0	5571
1155	0.1181	0	6379
1169	0.0352	0	NA
1176	0.04728	0	5019
1178	0.542	1	6336
1180	0.04822	0	4758
1184	NA	NA	NA
1185	0.6942	1	6897
1193	0.2719	0	7023
1196	0.1802	0	6256
1199	0.3981	0	5491
1203	0.2796	0	5132
1205	0.3067	0	4178
1207	0.03834	0	3927
1208	0.649	1	4465
1212	NA	NA	NA
1213	NA	NA	NA
1222	0.08023	0	7788
1223	0.275	0	NA
1226	0.3298	0	6086
1227	0.2948	0	5515
1229	NA	NA	NA
1230	0.2224	0	6007
1231	0.4392	0	4965
1241	0.1034	0	6365
1243	0.04095	0	4470
1244	0.2394	0	4696
1246	0.1607	0	5019
1248	NA	NA	NA
1249	0.2583	0	4601
1252	0.1276	0	6164
1261	0.07548	0	5998
1275	0.1549	0	6036
1281	0.8907	1	6666
1285	0.3488	0	5353
1288	0.481	0	5056
1290	0.07012	0	6508
1291	0.2093	0	5903
1304	NA	NA	NA
1305	0.1127	0	7727
1323	0.2519	0	8896
1342	NA	NA	NA
1348	NA	NA	NA
1353	0.2225	0	6192
1363	0.1995	0	4980
1371	0.2926	0	4315
1372	0.2252	0	8945
1378	0.2055	0	4273
1381	0.3177	0	4666
1382	0.2964	0	NA
1393	0.5309	1	5471
1394	0.02909	0	7070
1398	0.23	0	5191

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
1404	0.5087	1	4551
1405	0.7363	1	4906
1419	0.2155	0	7329
1421	0.1949	0	3837
1426	0.07789	0	3997
1431	0.4544	0	NA
1435	0.03864	0	7320
1437	0.3595	0	5000
1438	0.1717	0	6710
1442	0.4258	0	6804
1464	0.2207	0	6348
1471	0.3437	0	4873
1473	0.2598	0	6859
1476	0.03502	0	3584
1478	0.3105	0	4954
1479	0.4407	0	7658
1487	0.4354	0	4414
1492	0.3792	0	5395
1496	0.1481	0	6162
1497	0.4135	0	4256
1515	0.01855	0	4319
1519	0.2265	0	9410
1522	NA	NA	NA
1526	NA	NA	NA
1537	0.07045	0	NA
1538	0.9058	1	5564
1540	0.1602	0	6669
1543	0.1661	0	5437
1548	0.2209	0	6545
1549	0.1649	0	5532
1556	0.6133	1	5073
1564	0.02741	0	5276
1570	0.2745	0	5999
1577	0.5922	1	4901
1585	0.2981	0	2983
1590	0.2484	0	5050
1592	0.6388	1	4856
1594	0.3407	0	5616
1596	NA	NA	NA
1598	NA	NA	NA
1603	NA	NA	NA
1607	0.1504	0	3561
1612	NA	NA	NA
1627	NA	NA	NA
1629	0.7772	1	5352
1630	0.1528	0	5330
1640	0.55	1	4875
1641	0.3781	0	6084
1646	NA	NA	NA
1662	0.5494	1	4518
1668	NA	NA	NA
1671	0.04603	0	3545
1672	0.5323	1	4560
1673	0.6551	1	6878
1686	0.3641	0	3462
1688	0.5925	1	4242
1696	0.02242	0	6793
1701	0.0472	0	4442

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
1707	0.1644	0	6515
1708	0.04402	0	4331
1713	0.0422	0	NA
1715	0.1367	0	6968
1717	0.03208	0	NA
1721	0.3099	0	7204
1724	NA	NA	NA
1725	0.7121	1	6872
1730	0.06584	0	4583
1731	0.6001	1	3634
1734	0.335	0	5899
1740	0.1538	0	8032
1748	0.05553	0	4664
1749	0.05327	0	6339
1750	0.5998	1	5039
1763	0.1571	0	5027
1768	0.05795	0	6969
1773	0.6105	1	4236
1777	0.2188	0	3443
1778	0.45	0	NA
1780	0.1093	0	5716
1782	0.25	0	4383
1784	NA	NA	NA
1786	0.1525	0	5996
1787	0.09853	0	5874
1792	0.2588	0	7597
1800	0.4474	0	6552
1801	0.2816	0	NA
1803	0.1342	0	4989
1804	0.6527	1	4107
1807	0.01554	0	5740
1818	NA	NA	NA
1821	0.02862	0	6798
1822	0.07757	0	4295
1828	0.0629	0	NA
1833	0.2536	0	4843
1844	0.3419	0	7679
1847	0.3262	0	4351
1850	0.1427	0	5104
1854	NA	NA	NA
1858	NA	NA	NA
1864	0.1521	0	4462
1867	0.1119	0	5945
1876	0.754	1	4662
1880	0.2334	0	NA
1881	0.2289	0	2681
1891	0.1488	0	3922
1894	0.1718	0	7951
1895	0.04439	0	4988
1901	0.3171	0	5630
1905	0.03748	0	6828
1912	0.2607	0	NA
1918	0.4066	0	6257
1921	NA	NA	NA
1923	0.2135	0	NA
1924	NA	NA	NA
1931	0.1317	0	4651
1941	0.09363	0	5394

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
1950	0.0666	0	6609
1951	0.1551	0	5427
1954	0.02677	0	2242
1961	0.4458	0	6680
1966	0.01902	0	5949
1979	0.1004	0	4844
1982	NA	NA	NA
1987	0.743	1	4052
1997	0.4535	0	5646
2004	0.04097	0	6836
2011	0.6041	1	4646
2015	0.2506	0	3849
2025	0.01711	0	4240
2033	0.2488	0	4761
2034	0.008388	0	6562
2035	0.1198	0	7695
2036	0.4453	0	4123
2053	0.6898	1	7972
2059	0.7235	1	6821
2060	0.01933	0	7651
2073	NA	NA	NA
2084	0.4465	0	3808
2089	0.07392	0	4876
2092	0.1969	0	4620
2109	0.4512	0	5525
2129	0.2513	0	8346
2134	0.3149	0	4323
2135	0.02947	0	7008
2148	0.02625	0	5556
2149	NA	NA	NA
2150	0.3305	0	5882
2165	0.7297	1	6775
2166	0.04809	0	5475
2168	0.07046	0	6390
2170	0.2554	0	3523
2171	0.1062	0	5079
2172	0.03118	0	3753
2176	0.2208	0	6463
2182	0.0649	0	4166
2189	0.1498	0	3099
2191	0.08038	0	3929
2197	0.02079	0	4996
2202	0.09998	0	4533
2203	0.1312	0	6448
2204	0.5773	1	5885
2206	0.7187	1	5982
2218	0.05236	0	7987
2219	0.2112	0	6643
2221	0.4666	0	6388
2226	0.1108	0	5764
2228	NA	NA	NA
2232	0.6331	1	6093
2236	0.3778	0	6232
2241	0.8309	1	6194
2245	0.09843	0	6916
2251	0.2301	0	4804
2255	0.04828	0	5582
2256	0.0193	0	6959

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
2259	0.03198	0	5342
2263	0.373	0	3872
2264	0.07659	0	NA
2267	0.1332	0	6468
2273	0.7754	1	5930
2277	0.5577	1	2901
2287	0.2155	0	4609
2289	NA	NA	NA
2291	NA	NA	NA
2296	0.8123	1	4021
2299	0.08981	0	NA
2306	0.04288	0	3552
2314	0.3172	0	5166
2317	0.01167	0	6720
2318	0.6482	1	6811
2321	0.8607	1	4785
2324	0.03378	0	4416
2340	NA	NA	NA
2343	NA	NA	NA
2349	0.3177	0	4014
2352	0.254	0	NA
2353	0.3927	0	4892
2365	0.7447	1	4408
2370	0.4583	0	5271
2378	0.347	0	2728
2390	0.3579	0	5240
2399	0.2432	0	6353
2402	0.7673	1	5465
2403	0.4675	0	NA
2404	0.1342	0	5788
2414	0.2642	0	4231
2422	0.29	0	NA
2424	0.1848	0	7258
2430	0.5304	1	3467
2435	NA	NA	NA
2439	0.05404	0	5454
2442	NA	NA	NA
2445	0.4158	0	NA
2449	0.2499	0	6022
2451	NA	NA	NA
2461	0.7464	1	5100
2464	NA	NA	NA
2465	0.5908	1	6942
2472	0.07099	0	5076
2476	0.5588	1	5024
2482	0.1987	0	6147
2487	0.1513	0	NA
2498	0.1856	0	NA
2501	0.09822	0	NA
2504	0.2895	0	2109
2511	NA	NA	NA
2518	0.03951	0	NA
2521	0.1298	0	NA
2530	0.2025	0	4759
2543	NA	NA	NA
2545	0.3075	0	5783
2561	0.3693	0	NA
2566	0.4983	0	7170

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
2572	0.2654	0	6271
2577	0.1446	0	7218
2578	0.2544	0	7688
2580	0.3266	0	7442
2581	0.293	0	4439
2582	0.1306	0	NA
2584	0.07339	0	NA
2590	0.02218	0	7817
2598	0.01151	0	5648
2602	0.1521	0	NA
2605	0.01511	0	6741
2616	0.1632	0	4339
2618	0.2534	0	6403
2619	0.3259	0	5760
2624	0.06301	0	6016
2632	0.1684	0	7297
2640	0.3495	0	4619
2646	0.01876	0	2710
2651	0.1386	0	8124
2660	0.04379	0	3430
2661	0.02685	0	6894
2668	0.05735	0	4090
2670	0.3152	0	5735
2680	0.4633	0	5458
2681	0.01341	0	6047
2689	0.3767	0	3779
2694	NA	NA	NA
2695	0.8022	1	7500
2696	0.4301	0	7395
2702	0.03872	0	3452
2704	0.1181	0	4350
2708	0.07601	0	6072
2709	0.03237	0	5850
2714	0.4149	0	4649
2716	0.1974	0	3762
2723	0.1139	0	NA
2725	0.3293	0	5146
2738	0.05028	0	NA
2750	0.3981	0	7125
2756	0.2886	0	4167
2758	0.05219	0	4032
2766	0.1756	0	3902
2767	0.2812	0	5402
2771	0.3281	0	NA
2775	0.6042	1	3579
2776	0.1958	0	5569
2779	0.915	1	6063
2780	0.3504	0	5140
2781	0.2776	0	NA
2782	0.5208	1	6675
2783	0.2029	0	3719
2796	NA	NA	NA
2798	0.4121	0	NA
2800	0.09902	0	6295
2803	0.1389	0	3449
2806	0.005981	0	3918
2813	0.09904	0	5047
2818	0.08394	0	5443

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
2821	NA	NA	NA
2825	0.3064	0	4356
2829	0.04146	0	5159
2830	0.7053	1	5227
2833	0.06758	0	6455
2839	0.8992	1	3878
2843	0.08926	0	5430
2846	0.07887	0	8158
2847	0.09807	0	8497
2848	0.08112	0	4900
2856	0.8363	1	6354
2863	0.3808	0	5213
2867	0.3407	0	5510
2869	0.192	0	2822
2873	0.01128	0	5271
2874	0.2989	0	4910
2875	0.4679	0	3040
2880	NA	NA	NA
2886	NA	NA	NA
2887	0.2846	0	5607
2888	0.3363	0	4663
2889	0.5934	1	2228
2890	0.453	0	5625
2892	0.523	1	4239
2901	0.128	0	5532
2902	0.2172	0	6476
2905	0.3558	0	7710
2917	0.2817	0	6744
2922	0.5455	1	6764
2924	NA	NA	NA
2930	0.1607	0	7515
2931	0.09846	0	7446
2946	0.1258	0	5161
2955	0.4378	0	6384
2962	0.02385	0	4818
2964	0.01923	0	6672
2965	0.3343	0	6228
2967	0.03135	0	5243
2970	0.153	0	4392
2973	NA	NA	NA
2974	NA	NA	NA
2976	0.6076	1	7821
2977	0.3302	0	5357
2978	0.1795	0	4598
2986	0.1398	0	6121
2988	NA	NA	NA
2989	0.1312	0	7729
2995	0.7242	1	6564
3005	0.583	1	NA
3011	0.1501	0	4022
3013	0.1084	0	3936
3019	0.5346	1	5501
3021	0.03381	0	7948
3022	0.2668	0	5945
3029	NA	NA	NA
3037	0.1782	0	4331
3042	0.1021	0	3794
3043	0.1363	0	8124

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
3049	NA	NA	NA
3050	0.5438	1	6188
3053	0.2299	0	5080
3058	0.1623	0	7854
3062	0.2771	0	5566
3063	0.2682	0	NA
3065	0.04461	0	4101
3080	0.09591	0	3136
3088	0.1703	0	8394
3093	0.3012	0	7812
3096	0.4077	0	6899
3101	0.3429	0	7348
3103	0.5317	1	NA
3107	0.2676	0	NA
3109	NA	NA	NA
3111	0.1111	0	4728
3113	0.7897	1	5122
3116	0.007077	0	NA
3132	0.1189	0	5180
3141	0.1614	0	5168
3153	0.3272	0	5876
3154	0.08468	0	6618
3160	0.2657	0	4966
3167	0.07249	0	NA
3170	0.361	0	5537
3173	0.4895	0	3391
3174	0.295	0	3401
3177	0.1705	0	7148
3179	0.2767	0	3444
3184	0.4412	0	3955
3190	0.3591	0	7679
3193	NA	NA	NA
3199	0.2279	0	4513
3201	NA	NA	NA
3202	0.2493	0	6400
3203	0.5847	1	2741
3206	0.7322	1	4518
3209	0.04534	0	4484
3210	0.3781	0	5018
3217	0.2151	0	6278
3220	0.08447	0	4920
3228	0.4469	0	6145
3232	0.03913	0	6920
3239	0.05667	0	10349
3243	0.3465	0	9073
3245	0.1423	0	7009
3246	0.3833	0	6036
3251	0.06941	0	5398
3253	0.4492	0	4246
3257	0.05335	0	3882
3260	0.02819	0	5849
3261	0.2538	0	5476
3263	0.1851	0	4952
3278	0.1407	0	NA
3281	NA	NA	NA
3283	0.07939	0	4925
3290	0.01956	0	4794
3297	0.2947	0	5030

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
3304	0.05614	0	5090
3305	0.454	0	4420
3307	NA	NA	NA
3308	0.2805	0	8182
3313	0.275	0	5383
3314	0.3831	0	6211
3317	0.1743	0	6049
3348	0.07017	0	4658
3350	0.2277	0	5586
3359	0.03217	0	4668
3367	0.1104	0	5496
3376	0.2008	0	7088
3378	0.2995	0	6047
3384	0.7648	1	5605
3386	0.1235	0	5511
3387	0.1399	0	3720
3388	0.06509	0	6471
3390	0.03829	0	4310
3391	NA	NA	NA
3396	0.3428	0	NA
3398	0.02641	0	4576
3404	0.0666	0	5718
3406	0.02672	0	7739
3407	0.05707	0	4771
3414	0.1083	0	5397
3419	NA	NA	NA
3423	0.5022	1	5395
3427	0.04676	0	4531
3432	0.09246	0	6370
3434	0.1134	0	NA
3438	0.08295	0	3981
3442	0.2844	0	2592
3443	0.08278	0	5420
3448	0.08944	0	NA
3456	0.08536	0	5110
3464	0.1998	0	4257
3470	0.5138	1	4506
3475	0.4271	0	7291
3477	0.3343	0	6580
3490	0.1119	0	4853
3493	0.3364	0	6785
3502	NA	NA	NA
3508	0.02703	0	7503
3516	0.0553	0	5493
3517	0.1864	0	4813
3525	0.2695	0	4984
3532	0.5775	1	5628
3535	0.235	0	3476
3536	0.7043	1	4601
3540	0.07429	0	9888
3547	0.2876	0	7042
3550	0.3728	0	5807
3557	NA	NA	NA
3562	0.1409	0	6758
3563	0.08331	0	NA
3564	0.2427	0	4918
3570	0.1189	0	4416
3573	0.3985	0	5881

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
3577	0.4778	0	5086
3579	0.5739	1	NA
3581	NA	NA	NA
3587	0.2651	0	2549
3602	0.3084	0	6049
3609	0.5581	1	4301
3612	0.2001	0	NA
3621	0.3502	0	4796
3642	0.1941	0	6165
3647	0.7175	1	6484
3649	0.5499	1	7868
3654	0.5537	1	7807
3660	0.5641	1	3704
3665	0.6805	1	4920
3669	0.3239	0	3594
3673	0.2078	0	8560
3675	0.5674	1	8358
3678	0.04528	0	3868
3680	0.3921	0	3856
3686	0.544	1	6247
3693	0.2518	0	7352
3710	NA	NA	NA
3713	0.04243	0	NA
3718	0.3031	0	6568
3725	0.07896	0	3686
3726	0.3307	0	NA
3747	0.1105	0	7012
3753	0.01795	0	5612
3754	0.2575	0	5390
3760	0.8297	1	6590
3763	0.1092	0	NA
3765	0.3352	0	7971
3769	0.1903	0	4725
3771	0.6109	1	6040
3784	0.09762	0	4466
3787	NA	NA	NA
3794	0.2638	0	3624
3796	0.08333	0	NA
3798	0.0973	0	6095
3809	0.2716	0	6418
3812	0.2933	0	8411
3819	0.2143	0	NA
3828	0.1197	0	4638
3831	0.2327	0	4748
3833	0.1504	0	5508
3837	0.6687	1	4308
3839	0.7909	1	5080
3843	0.385	0	5280
3846	NA	NA	NA
3854	0.04198	0	4577
3861	0.08067	0	4412
3864	0.4054	0	5299
3868	0.0952	0	4472
3869	0.1128	0	3384
3870	0.2103	0	3933
3883	0.2711	0	5773
3886	0.04617	0	3069
3889	0.2433	0	6572

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
3894	0.4273	0	7072
3907	0.05348	0	2682
3910	NA	NA	NA
3913	0.0223	0	3411
3914	0.1486	0	7850
3921	0.2951	0	4948
3923	0.03789	0	4226
3929	0.5008	1	7715
3931	0.5581	1	4869
3932	0.2386	0	3862
3937	0.5107	1	3580
3943	0.3512	0	4834
3956	NA	NA	NA
3957	0.367	0	3654
3961	0.5568	1	4863
3971	NA	NA	NA
4004	NA	NA	NA
4005	0.0465	0	8477
4006	0.01144	0	6364
4011	NA	NA	NA
4013	0.1348	0	4742
4014	0.1363	0	2981
4016	0.6042	1	NA
4017	0.02113	0	3054
4020	0.05775	0	5461
4022	0.1217	0	6569
4026	NA	NA	NA
4032	NA	NA	NA
4043	0.02347	0	6687
4045	0.2303	0	3530
4048	0.2161	0	6273
4051	0.06768	0	4942
4052	0.2628	0	7057
4056	0.04187	0	2429
4059	0.04067	0	6256
4069	NA	NA	NA
4074	0.3328	0	5142
4076	0.2837	0	NA
4077	0.677	1	7240
4079	0.7121	1	4994
4081	0.4838	0	7437
4088	0.129	0	NA
4105	0.2427	0	4601
4125	0.215	0	6548
4134	0.4783	0	4688
4139	NA	NA	NA
4146	0.04168	0	6770
4149	0.1168	0	NA
4151	0.7609	1	4075
4155	0.213	0	3587
4157	0.1291	0	7219
4168	0.5873	1	4938
4170	0.2448	0	5821
4174	0.1172	0	4722
4179	0.3014	0	6201
4185	0.09431	0	3618
4199	0.6694	1	6337
4205	0.08463	0	5581

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
4208	0.02085	0	4397
4211	NA	NA	NA
4212	0.08175	0	6381
4215	0.5791	1	6582
4217	NA	NA	NA
4219	0.8092	1	4929
4226	0.4115	0	3569
4227	0.1805	0	3706
4229	0.02944	0	NA
4231	0.152	0	7261
4233	0.01316	0	2776
4237	0.2933	0	3099
4243	0.3511	0	6903
4248	0.1884	0	5009
4255	0.1316	0	4269
4262	0.07495	0	6851
4266	0.5524	1	4949
4268	0.3333	0	5486
4270	0.6729	1	6968
4273	0.1076	0	3110
4276	0.1374	0	5914
4277	0.1508	0	NA
4279	0.3578	0	6462
4299	0.1964	0	5164
4313	0.04026	0	5943
4322	0.05013	0	6666
4324	0.09521	0	3950
4328	0.2688	0	4598
4331	0.4019	0	NA
4335	0.0425	0	5790
4337	NA	NA	NA
4338	0.3296	0	6994
4343	0.06121	0	5246
4347	0.1677	0	5608
4355	0.6505	1	6334
4357	0.003136	0	7532
4359	0.1355	0	3657
4362	0.1122	0	6177
4368	0.4968	0	NA
4374	0.05977	0	6440
4375	0.4623	0	4865
4378	0.3529	0	NA
4381	0.5958	1	6729
4387	0.1461	0	7334
4400	0.04302	0	5681
4423	0.1543	0	3950
4424	0.03687	0	2586
4428	NA	NA	NA
4433	0.7588	1	6204
4436	0.4273	0	4554
4437	0.2793	0	5229
4439	0.3456	0	5421
4449	0.1499	0	3484
4456	0.05948	0	7219
4463	0.09729	0	5701
4467	0.133	0	5762
4468	0.09895	0	6942
4469	0.1063	0	4330

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
4472	0.2894	0	6474
4473	0.05121	0	NA
4476	0.7027	1	4506
4500	0.04712	0	4633
4509	0.3207	0	5256
4513	0.8505	1	5283
4521	NA	NA	NA
4527	0.4165	0	7094
4530	NA	NA	NA
4532	0.4015	0	6508
4533	0.06814	0	5617
4535	NA	NA	NA
4536	0.535	1	6616
4542	0.3684	0	5114
4551	0.7343	1	5551
4554	0.06092	0	8175
4555	0.3652	0	NA
4564	0.2369	0	6194
4572	0.3326	0	6883
4573	NA	NA	NA
4577	0.1833	0	6577
4579	0.3873	0	4823
4583	0.1045	0	4589
4584	0.489	0	3103
4596	0.05091	0	4211
4599	0.1362	0	5985
4607	0.245	0	7941
4609	0.4018	0	3454
4610	0.1238	0	5430
4616	0.2197	0	8885
4617	0.1714	0	6702
4633	0.194	0	4640
4638	0.3908	0	6596
4641	0.03366	0	7234
4653	0.3794	0	4497
4655	0.3039	0	6464
4659	0.3424	0	4753
4669	0.1037	0	4609
4678	0.1135	0	NA
4685	0.6611	1	6501
4686	0.1769	0	5113
4691	0.3188	0	6758
4695	0.2453	0	5905
4698	NA	NA	NA
4700	0.5515	1	4914
4711	NA	NA	NA
4722	0.03401	0	4797
4727	0.3632	0	3588
4756	0.02201	0	4453
4762	0.4654	0	4139
4763	0.3511	0	7331
4766	0.1098	0	6481
4770	0.1507	0	5058
4784	0.4037	0	6863
4791	0.08122	0	5138
4795	0.107	0	6510
4799	0.5691	1	5766
4802	0.4023	0	5240

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
4805	0.6919	1	4706
4814	0.5784	1	4955
4816	NA	NA	NA
4817	0.05815	0	4793
4822	0.4079	0	5305
4827	0.5434	1	NA
4833	0.1334	0	8186
4836	NA	NA	NA
4842	0.1584	0	9912
4844	0.1395	0	5582
4845	0.4252	0	4691
4849	0.1676	0	3091
4850	0.2508	0	6055
4860	0.03446	0	3621
4863	0.1891	0	6714
4871	NA	NA	NA
4878	0.3322	0	3449
4881	0.5706	1	7248
4888	0.4855	0	5848
4900	0.1154	0	7927
4906	0.3887	0	5665
4909	0.02061	0	7430
4916	0.1288	0	5388
4918	NA	NA	NA
4926	0.3068	0	5425
4928	0.1759	0	4346
4941	0.4627	0	4575
4946	0.08544	0	7919
4949	0.1553	0	7526
4956	NA	NA	NA
4966	0.1129	0	5909
4969	0.3948	0	4318
4973	0.1207	0	5898
4978	0.3812	0	4757
4982	0.239	0	3922
4985	0.09169	0	3963
4991	0.1651	0	6703
4998	0.06206	0	NA
5000	0.5743	1	7228
5004	0.5022	1	5989
5005	0.4427	0	6332
5011	0.6394	1	5029
5016	0.3421	0	4513
5018	0.06121	0	NA
5034	NA	NA	NA
5038	0.03832	0	4839
5042	0.1285	0	NA
5046	0.05871	0	3741
5051	0.2672	0	6189
5054	0.1897	0	6015
5057	0.3328	0	NA
5062	0.04124	0	NA
5063	0.04521	0	4057
5065	0.1158	0	5858
5066	0.1539	0	6195
5076	0.2081	0	6540
5089	0.2369	0	3500
5092	0.32	0	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
5093	0.5211	1	3305
5094	0.0277	0	4761
5098	0.6807	1	3942
5102	0.08569	0	NA
5112	0.3141	0	7382
5117	0.4611	0	7693
5127	0.5048	1	4746
5130	NA	NA	NA
5131	0.4345	0	3838
5132	0.5272	1	7285
5135	0.8486	1	4665
5136	0.0227	0	3328
5147	0.3969	0	6370
5157	0.1199	0	5498
5160	0.2355	0	6010
5165	0.02781	0	5921
5166	0.4566	0	5461
5172	0.7028	1	6122
5173	0.1936	0	5000
5179	NA	NA	NA
5184	0.4423	0	7542
5187	NA	NA	NA
5191	0.1173	0	5199
5193	0.1382	0	6597
5194	0.08933	0	NA
5199	0.2292	0	7478
5212	0.05072	0	5031
5213	0.5752	1	3515
5224	0.2462	0	3769
5226	NA	NA	NA
5239	0.3504	0	NA
5252	0.7401	1	6780
5264	0.1099	0	4350
5266	0.01282	0	NA
5271	0.01304	0	4569
5273	0.02625	0	4242
5276	0.6687	1	4465
5278	0.07404	0	5958
5281	0.6665	1	6406
5283	0.692	1	7007
5291	0.08633	0	5626
5294	0.2803	0	5300
5296	0.3972	0	4648
5297	0.83	1	5893
5313	0.02684	0	3573
5314	0.4245	0	4020
5321	0.1992	0	6008
5325	0.02505	0	3492
5326	0.2361	0	7223
5328	0.02331	0	NA
5334	0.1845	0	5628
5338	0.4033	0	3433
5344	NA	NA	NA
5348	0.3038	0	5031
5352	0.3064	0	5767
5353	0.08067	0	6061
5354	0.3226	0	5154
5361	0.9063	1	4109

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
5364	0.05128	0	4550
5365	0.1097	0	5077
5367	0.4252	0	4380
5379	0.3142	0	4980
5382	0.2946	0	8635
5386	0.2572	0	2908
5395	0.1244	0	5553
5410	0.3705	0	5629
5411	NA	NA	NA
5416	0.2978	0	5762
5424	0.6798	1	4093
5426	NA	NA	NA
5428	0.09761	0	6432
5430	0.3306	0	4214
5433	0.1709	0	4739
5437	0.003248	0	9494
5440	0.2152	0	6745
5442	0.8528	1	6362
5445	0.62	1	5431
5449	0.2348	0	4527
5452	0.3593	0	3906
5460	0.5758	1	2870
5461	0.05004	0	3549
5465	0.3057	0	6224
5467	0.1095	0	1943
5471	0.2492	0	6066
5474	0.6748	1	7979
5475	0.04686	0	6446
5480	0.1003	0	5489
5481	0.2834	0	6883
5484	NA	NA	NA
5494	0.0622	0	NA
5495	0.823	1	4643
5497	0.05216	0	3785
5499	0.5334	1	6052
5507	0.05373	0	6745
5510	0.0991	0	5463
5515	0.189	0	3308
5516	0.0905	0	7538
5517	0.2044	0	7728
5524	0.0908	0	6655
5530	0.1455	0	5374
5534	0.2884	0	NA
5543	0.4106	0	7555
5545	0.634	1	5305
5558	0.06965	0	NA
5562	0.1857	0	7682
5573	0.7614	1	7682
5581	0.1152	0	4937
5583	0.5387	1	7238
5587	0.5814	1	3679
5589	0.7622	1	5298
5591	0.07318	0	NA
5596	NA	NA	NA
5606	0.7603	1	5994
5608	0.3715	0	6310
5611	0.06992	0	3427
5612	0.2669	0	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
5614	0.3595	0	5078
5620	0.06002	0	4341
5623	0.1613	0	4481
5624	0.2487	0	6346
5626	0.3201	0	3699
5633	0.1755	0	5485
5635	0.06529	0	4737
5640	0.5631	1	4184
5643	0.09018	0	7141
5644	0.349	0	4408
5653	0.3405	0	6261
5663	0.02067	0	5042
5664	0.5043	1	4688
5667	NA	NA	NA
5671	0.5464	1	5815
5673	0.6395	1	7243
5676	0.05075	0	6502
5678	0.1066	0	5781
5698	NA	NA	NA
5700	0.02849	0	7760
5705	0.2386	0	5003
5706	0.6907	1	NA
5711	NA	NA	NA
5712	0.7802	1	3797
5716	0.4161	0	3199
5719	0.2428	0	6236
5725	0.8244	1	3034
5728	NA	NA	NA
5734	0.05967	0	5348
5735	0.05367	0	2912
5743	NA	NA	NA
5754	0.1954	0	NA
5755	0.2969	0	6372
5756	0.06026	0	6358
5766	NA	NA	NA
5770	0.4349	0	4995
5774	0.2638	0	6728
5775	0.02678	0	4605
5776	0.07782	0	7327
5778	0.02868	0	5549
5786	0.4113	0	4479
5787	0.4244	0	5994
5791	0.2429	0	NA
5794	0.2156	0	6467
5803	0.1834	0	5479
5804	0.399	0	4328
5808	0.195	0	3477
5810	0.03952	0	4287
5813	NA	NA	NA
5828	0.2418	0	6199
5839	0.2139	0	5470
5842	0.5042	1	NA
5843	0.05036	0	3287
5844	0.2785	0	5409
5847	0.6156	1	7708
5851	0.03762	0	5768
5854	0.02815	0	7463
5857	0.03152	0	4186

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
5866	0.3817	0	6002
5874	0.2821	0	3619
5886	0.07496	0	5386
5895	0.0954	0	NA
5897	0.0227	0	5952
5898	0.2233	0	4455
5900	0.6555	1	5668
5902	0.3321	0	5754
5908	NA	NA	NA
5909	0.05071	0	4659
5912	0.02563	0	4904
5913	0.1404	0	5606
5917	0.3553	0	4618
5918	0.7211	1	6262
5921	0.06835	0	7022
5931	0.2579	0	3241
5942	0.418	0	3314
5943	0.6797	1	6297
5950	0.05245	0	6085
5954	0.008763	0	5879
5983	0.03435	0	4409
5995	0.6046	1	4709
6002	0.08344	0	5278
6005	0.04378	0	3356
6009	0.2565	0	4901
6011	0.00605	0	5366
6012	0.02339	0	5821
6019	0.2088	0	4514
6021	0.2598	0	2752
6029	0.7134	1	7110
6036	0.4783	0	6343
6037	0.01052	0	5498
6038	0.03844	0	4080
6043	0.06195	0	5170
6045	0.1277	0	NA
6047	0.7159	1	5251
6048	0.03403	0	4965
6061	0.3363	0	7281
6063	0.1591	0	NA
6064	0.06898	0	6558
6068	0.7316	1	NA
6069	0.04758	0	5753
6070	0.4417	0	6549
6071	0.122	0	6806
6074	0.4913	0	4038
6079	0.2214	0	7095
6082	0.06613	0	6131
6088	0.8593	1	NA
6094	NA	NA	NA
6095	0.3055	0	4249
6098	0.3826	0	6483
6102	0.01543	0	3712
6105	0.3615	0	4875
6113	0.1297	0	6298
6116	0.4341	0	4139
6120	0.4339	0	5318
6121	0.3066	0	6288
6126	0.2844	0	7310

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
6144	0.1433	0	6604
6145	0.02232	0	5471
6153	0.3558	0	8131
6156	0.1249	0	7070
6159	0.3659	0	5417
6162	0.1421	0	5639
6184	0.6431	1	5577
6188	0.2934	0	6941
6189	0.3517	0	6826
6191	NA	NA	NA
6211	0.4383	0	5894
6216	0.1854	0	4419
6218	0.4688	0	5716
6222	0.2554	0	NA
6235	0.2998	0	4155
6245	0.1251	0	5567
6248	0.569	1	6031
6253	NA	NA	NA
6256	0.008421	0	8990
6257	0.5445	1	5078
6259	NA	NA	NA
6266	0.07119	0	8566
6268	0.2739	0	5074
6275	NA	NA	NA
6280	0.6166	1	6730
6283	NA	NA	NA
6288	0.06338	0	5363
6289	0.07853	0	3728
6301	NA	NA	NA
6308	0.2766	0	7245
6314	0.02575	0	6686
6315	0.09277	0	5507
6316	0.5572	1	NA
6317	0.3293	0	5516
6318	0.06813	0	NA
6323	0.6834	1	4460
6329	0.719	1	2596
6336	0.2557	0	4232
6341	NA	NA	NA
6348	0.2184	0	5923
6349	0.03797	0	6658
6365	0.08989	0	5206
6372	0.1285	0	4736
6376	NA	NA	NA
6378	0.07544	0	4482
6379	0.8021	1	NA
6382	0.1271	0	6148
6383	NA	NA	NA
6389	0.6254	1	4495
6390	0.05171	0	5068
6392	0.03886	0	4745
6394	0.5036	1	NA
6402	0.1031	0	7879
6404	0.3743	0	4470
6405	0.01807	0	4911
6406	NA	NA	NA
6409	0.1268	0	4824
6410	0.08248	0	4205

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
6411	0.1048	0	4845
6421	0.1339	0	5835
6428	0.3066	0	5063
6429	NA	NA	NA
6432	0.1144	0	4832
6436	0.05858	0	3274
6437	0.2758	0	5257
6438	0.1546	0	6278
6445	0.1349	0	5329
6447	0.4651	0	5406
6450	0.03273	0	6270
6462	0.2435	0	4421
6467	0.6983	1	NA
6478	0.04774	0	5996
6484	0.1633	0	6957
6492	0.3629	0	4822
6497	0.04436	0	5067
6504	NA	NA	NA
6505	0.1704	0	6480
6513	0.4569	0	5218
6525	0.2021	0	3385
6526	0.388	0	6133
6528	0.05318	0	4176
6540	0.006759	0	4348
6542	0.1762	0	6198
6544	NA	NA	NA
6548	0.1232	0	NA
6552	0.2023	0	NA
6558	0.01365	0	6627
6567	0.09187	0	5805
6569	0.5166	1	7590
6572	0.05963	0	5263
6577	NA	NA	NA
6581	0.3797	0	6774
6588	0.6719	1	5447
6591	0.5671	1	3295
6594	0.3088	0	7136
6600	0.4021	0	6845
6602	0.2336	0	5246
6604	0.07878	0	4402
6605	0.0783	0	NA
6614	0.1593	0	6785
6616	0.3072	0	5774
6621	0.3697	0	5032
6640	0.3197	0	NA
6641	NA	NA	NA
6643	0.07701	0	6549
6644	NA	NA	NA
6649	0.6356	1	6730
6650	0.5847	1	5869
6655	0.6256	1	4819
6661	0.02306	0	NA
6672	0.2541	0	NA
6677	0.04127	0	5944
6688	0.11	0	3393
6689	NA	NA	NA
6691	0.03065	0	6125
6692	0.4038	0	3244

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
6694	0.6636	1	5587
6702	0.6072	1	5175
6714	0.03663	0	4262
6716	0.3606	0	3350
6724	0.08383	0	5278
6725	0.05098	0	7638
6730	0.2237	0	8443
6735	0.4917	0	5594
6738	0.4072	0	NA
6739	0.3799	0	4848
6743	0.2274	0	5846
6747	0.1142	0	7287
6750	0.7208	1	5007
6751	0.4674	0	5166
6753	NA	NA	NA
6754	0.4136	0	7724
6755	0.172	0	5438
6762	0.1748	0	3599
6764	0.07654	0	6618
6772	0.6741	1	5234
6774	0.06776	0	5536
6787	0.303	0	5652
6789	NA	NA	NA
6793	0.1155	0	10313
6798	0.01331	0	6042
6799	0.02995	0	NA
6800	0.08099	0	5700
6802	0.05184	0	5284
6808	0.5028	1	2508
6809	0.09605	0	8025
6812	0.02514	0	3948
6814	0.7911	1	5969
6816	0.6203	1	4753
6822	0.1307	0	NA
6829	0.4555	0	NA
6834	0.8587	1	6721
6836	0.04837	0	5075
6839	0.07215	0	8881
6840	0.38	0	3525
6843	0.06241	0	7551
6846	0.5547	1	2710
6848	0.01952	0	6366
6852	0.09116	0	5524
6856	0.1607	0	4772
6860	0.1267	0	6247
6866	0.3845	0	5194
6870	0.5924	1	3453
6878	0.4673	0	NA
6880	0.2727	0	4960
6885	0.02612	0	4254
6897	0.07085	0	NA
6902	0.7651	1	5849
6904	0.5127	1	6917
6907	0.05124	0	5408
6909	NA	NA	NA
6914	0.5012	1	5155
6915	0.4846	0	NA
6922	0.2736	0	4186

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
6924	0.1831	0	NA
6933	0.06935	0	3285
6934	0.09964	0	5572
6941	0.2205	0	5288
6957	0.3988	0	NA
6960	0.07196	0	4728
6969	NA	NA	NA
6975	NA	NA	NA
6980	0.7211	1	6172
6983	NA	NA	NA
6987	0.07809	0	4680
6994	0.03858	0	3817
6997	0.01219	0	3147
7002	0.1195	0	7593
7010	NA	NA	NA
7015	0.5559	1	3138
7019	0.3025	0	3679
7022	0.2591	0	7024
7025	0.02192	0	5950
7029	0.07229	0	7536
7031	0.17	0	6140
7037	0.3542	0	5558
7038	0.3134	0	6119
7043	0.1388	0	3276
7049	0.06991	0	7725
7052	0.2715	0	3127
7053	0.3136	0	5558
7056	0.009383	0	6065
7057	0.4901	0	4601
7080	0.1886	0	7643
7086	0.3285	0	5950
7087	0.121	0	4347
7105	0.4724	0	4790
7108	NA	NA	NA
7121	0.4042	0	4103
7122	0.2193	0	5911
7125	0.4101	0	6545
7132	0.2744	0	6075
7134	0.1407	0	5004
7151	0.2507	0	NA
7152	0.6994	1	4520
7157	0.1907	0	5322
7159	0.2921	0	6954
7166	0.6377	1	3679
7167	0.08439	0	6313
7177	0.04687	0	4372
7179	0.616	1	5512
7181	0.2821	0	6640
7183	0.1596	0	7406
7186	0.03455	0	4066
7193	0.03031	0	8268
7205	0.03251	0	5651
7207	0.03658	0	4002
7209	0.373	0	5244
7216	0.2822	0	6578
7232	0.7265	1	6303
7235	0.1085	0	NA
7238	NA	NA	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
7240	0.6323	1	5039
7243	NA	NA	NA
7252	0.195	0	9393
7269	0.2055	0	7205
7275	0.03975	0	4853
7281	NA	NA	NA
7283	0.05575	0	6627
7287	0.2093	0	NA
7289	0.2778	0	7997
7291	0.3913	0	6996
7294	0.04737	0	4874
7304	0.437	0	3948
7308	0.2702	0	NA
7313	0.05841	0	5078
7319	0.3014	0	3645
7325	0.1703	0	5582
7326	0.1533	0	NA
7330	NA	NA	NA
7332	NA	NA	NA
7337	0.2657	0	5212
7341	0.2131	0	3754
7346	NA	NA	NA
7353	0.5371	1	6035
7354	0.579	1	5631
7361	0.3918	0	6001
7366	0.5091	1	7922
7368	0.03048	0	NA
7372	0.05445	0	5526
7375	0.3875	0	5435
7377	0.3066	0	4208
7380	0.1073	0	5021
7382	0.2623	0	7279
7385	0.6099	1	7450
7392	0.6307	1	5912
7395	0.1253	0	4873
7397	0.2113	0	4780
7403	NA	NA	NA
7406	0.2555	0	7118
7409	NA	NA	NA
7410	0.3106	0	5330
7412	0.07648	0	7017
7419	0.3681	0	5053
7425	0.08251	0	3505
7435	NA	NA	NA
7438	NA	NA	NA
7440	0.245	0	6812
7447	0.1587	0	4644
7449	0.5959	1	5272
7456	NA	NA	NA
7464	0.1957	0	3787
7478	0.1425	0	8558
7480	0.01682	0	6765
7481	0.4132	0	5254
7483	0.2004	0	4202
7484	0.1978	0	4251
7491	0.5541	1	8070
7494	0.3817	0	5238
7501	0.3754	0	6066

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
7503	0.8052	1	7866
7509	NA	NA	NA
7517	NA	NA	NA
7518	0.15	0	6078
7519	0.3656	0	6326
7521	0.4103	0	4310
7522	0.4702	0	5192
7536	0.06065	0	7457
7539	0.04095	0	5737
7547	NA	NA	NA
7549	NA	NA	NA
7552	0.577	1	4469
7554	0.3423	0	7815
7556	0.03725	0	4993
7564	0.1056	0	6182
7566	0.2041	0	8502
7570	0.2367	0	7249
7571	0.0293	0	4826
7572	0.2053	0	NA
7575	0.09879	0	6455
7586	0.1113	0	5313
7589	0.06295	0	6514
7590	0.04135	0	6685
7597	0.2425	0	3906
7602	0.05224	0	5785
7604	0.4658	0	6287
7605	0.3691	0	3872
7612	0.7963	1	NA
7615	NA	NA	NA
7617	NA	NA	NA
7624	0.1142	0	4954
7632	0.1996	0	6181
7639	0.3158	0	3851
7642	NA	NA	NA
7643	0.09522	0	7578
7649	0.3671	0	4517
7650	0.3813	0	5082
7653	0.3766	0	5801
7654	0.3051	0	3239
7657	0.4942	0	NA
7662	0.2924	0	5771
7669	0.8235	1	7237
7671	0.02389	0	4041
7675	0.08791	0	NA
7678	0.2313	0	7246
7682	0.7825	1	6017
7688	0.3104	0	5573
7689	0.2093	0	NA
7690	0.1319	0	5533
7692	NA	NA	NA
7699	0.341	0	7004
7705	0.557	1	4965
7712	0.1447	0	3099
7726	0.5454	1	5345
7728	0.1508	0	7267
7735	NA	NA	NA
7737	0.6557	1	4446
7739	0.04481	0	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
7743	0.6116	1	5531
7744	0.1831	0	NA
7746	0.2833	0	NA
7749	0.3382	0	5873
7750	0.2593	0	3913
7752	0.04092	0	4862
7755	0.1087	0	5944
7756	0.8198	1	5561
7762	0.1215	0	5585
7764	0.5826	1	4907
7769	0.1158	0	2836
7770	0.3992	0	6468
7776	0.2632	0	3478
7778	0.4155	0	3675
7784	0.4647	0	6418
7786	0.2194	0	5384
7789	0.1934	0	4832
7793	0.1951	0	6417
7794	0.08699	0	NA
7804	0.231	0	NA
7811	NA	NA	NA
7813	0.1699	0	6475
7815	0.3152	0	5280
7817	0.02225	0	5128
7818	0.2217	0	8895
7821	0.2253	0	5773
7825	0.02431	0	NA
7830	0.467	0	4165
7832	0.1691	0	4551
7835	0.0165	0	NA
7839	0.1231	0	7080
7842	0.07586	0	5350
7849	0.5016	1	7480
7856	0.3876	0	7482
7857	0.004831	0	5908
7863	0.09146	0	6782
7866	0.17	0	3410
7871	0.1494	0	5216
7875	NA	NA	NA
7882	0.8144	1	6435
7887	0.62	1	5153
7888	NA	NA	NA
7891	0.8335	1	6991
7895	0.01574	0	6888
7901	NA	NA	NA
7906	0.2365	0	5668
7908	0.8055	1	5837
7917	NA	NA	NA
7924	0.6438	1	4583
7948	0.1741	0	NA
7950	0.7433	1	6009
7955	NA	NA	NA
7957	0.07371	0	2531
7959	0.2317	0	5311
7967	0.09708	0	4748
7969	0.05027	0	7204
7971	0.1729	0	6489
7974	0.2578	0	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
7976	0.0894	0	5890
7986	0.7631	1	4053
7987	NA	NA	NA
7993	0.3705	0	5680
7996	0.4322	0	6939
7998	0.283	0	2377
8018	0.05636	0	4212
8019	0.3795	0	NA
8027	0.01575	0	2863
8036	0.1314	0	4766
8040	0.06262	0	4566
8044	0.08932	0	NA
8050	0.04643	0	5429
8052	0.5795	1	NA
8054	0.2211	0	3798
8057	0.5018	1	3782
8058	0.1821	0	NA
8059	0.631	1	4441
8066	0.7646	1	4996
8070	0.03201	0	8795
8072	0.349	0	6646
8078	0.03621	0	3700
8079	0.05216	0	5570
8080	0.2261	0	3910
8081	0.1813	0	8552
8088	0.1229	0	6751
8091	NA	NA	NA
8094	NA	NA	NA
8095	0.6986	1	5449
8099	0.1037	0	4847
8101	0.2943	0	4682
8102	0.007156	0	7275
8116	0.3713	0	4645
8125	0.4551	0	4471
8134	0.3021	0	5998
8139	0.03433	0	7149
8141	0.06425	0	7778
8147	0.07794	0	NA
8158	0.2018	0	6280
8160	NA	NA	NA
8165	0.3245	0	5024
8187	0.3396	0	6551
8205	0.4436	0	4766
8209	0.2999	0	8060
8211	0.3795	0	5903
8232	NA	NA	NA
8236	NA	NA	NA
8237	0.2556	0	4240
8238	0.7427	1	5809
8245	0.3455	0	4602
8256	0.2717	0	4682
8268	0.06638	0	6147
8269	0.02077	0	4260
8270	0.4714	0	5007
8286	0.1151	0	NA
8289	0.08858	0	6855
8301	0.4462	0	5137
8305	NA	NA	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
8310	0.348	0	NA
8312	0.03615	0	8351
8318	0.8631	1	5276
8321	0.141	0	5358
8328	0.05982	0	3232
8331	0.02815	0	5544
8334	0.2613	0	4152
8344	0.2755	0	6147
8345	0.1146	0	6507
8352	0.3849	0	5163
8358	0.4372	0	NA
8359	0.4035	0	5130
8360	0.1522	0	4312
8365	0.3022	0	5861
8366	0.1697	0	6424
8369	0.7122	1	3161
8373	0.03738	0	4477
8378	0.09843	0	NA
8392	0.123	0	6971
8397	0.3753	0	5745
8399	0.1758	0	4255
8400	0.1578	0	7087
8405	0.6483	1	7243
8406	0.05891	0	4649
8410	0.2018	0	4682
8413	0.09536	0	5200
8414	0.399	0	6464
8416	NA	NA	NA
8426	0.0429	0	NA
8434	0.2304	0	5696
8439	0.1348	0	NA
8440	0.1855	0	1462
8475	0.01483	0	6483
8480	NA	NA	NA
8497	0.1836	0	7309
8499	0.7658	1	6847
8500	0.3599	0	5192
8501	0.1202	0	5547
8502	NA	NA	NA
8518	0.2708	0	5259
8520	0.537	1	4351
8523	0.4462	0	6541
8525	NA	NA	NA
8532	0.1434	0	6317
8535	0.4381	0	6136
8543	0.1988	0	4073
8554	0.2508	0	5182
8560	0.08541	0	3235
8561	0.2514	0	6934
8563	0.03022	0	6572
8566	0.8024	1	3257
8570	0.3469	0	5725
8572	0.0684	0	NA
8582	0.1855	0	6022
8583	0.2025	0	4855
8587	0.1492	0	4531
8592	NA	NA	NA
8593	0.3812	0	5138

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
8607	0.01679	0	3951
8609	0.2819	0	NA
8610	0.03462	0	6993
8614	0.2976	0	5538
8616	0.4793	0	5274
8622	NA	NA	NA
8623	0.1635	0	4557
8624	0.3441	0	6545
8633	0.144	0	4951
8641	NA	NA	NA
8644	NA	NA	NA
8649	0.6433	1	NA
8653	0.1616	0	6004
8657	0.1148	0	8053
8658	0.1252	0	3942
8663	0.06849	0	3554
8672	0.7013	1	4442
8680	0.5056	1	3072
8684	0.3838	0	NA
8687	0.1123	0	3340
8688	0.1277	0	1869
8690	0.1254	0	4973
8712	0.3817	0	4337
8717	0.2302	0	5348
8730	0.1237	0	5230
8739	0.1633	0	NA
8744	0.02648	0	3977
8747	0.3095	0	3777
8748	0.2913	0	7126
8751	0.7506	1	NA
8758	0.3361	0	6745
8761	0.4553	0	5977
8763	0.0132	0	5414
8764	0.1486	0	6510
8765	0.1241	0	5487
8773	0.09849	0	5061
8780	0.203	0	5316
8781	0.1377	0	3299
8782	0.3932	0	4529
8785	0.1272	0	8133
8786	0.3653	0	4555
8797	0.8042	1	NA
8799	0.07846	0	6551
8807	0.7271	1	4909
8816	0.05086	0	5019
8817	0.1155	0	4776
8826	0.2336	0	NA
8833	NA	NA	NA
8834	0.08508	0	7348
8835	0.1423	0	6066
8840	0.1449	0	5926
8843	0.09092	0	6707
8849	NA	NA	NA
8855	0.09769	0	7239
8861	0.225	0	6329
8862	0.2776	0	7454
8865	0.2967	0	7564
8868	NA	NA	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
8870	0.03048	0	5588
8880	0.2432	0	5242
8885	0.07277	0	5208
8894	0.2391	0	5786
8895	0.1662	0	NA
8899	0.06422	0	4212
8912	0.429	0	NA
8922	0.01717	0	3616
8924	0.1148	0	4655
8928	0.2885	0	3911
8932	0.3277	0	4705
8943	0.1271	0	6107
8945	0.2123	0	2988
8946	0.04513	0	5418
8954	0.3807	0	5914
8958	0.4342	0	NA
8960	NA	NA	NA
8965	0.1718	0	5411
8966	NA	NA	NA
8967	0.05851	0	7357
8969	0.3727	0	4701
8980	0.1666	0	4798
8984	0.04374	0	4580
8985	0.8273	1	4801
8988	0.3072	0	6469
8989	0.3352	0	6479
8995	NA	NA	NA
9004	NA	NA	NA
9010	0.06323	0	5509
9012	0.275	0	NA
9018	0.5613	1	1839
9036	0.2747	0	NA
9037	0.2999	0	2543
9040	0.1127	0	6364
9041	0.4715	0	6137
9044	0.1972	0	10194
9045	0.1054	0	4443
9047	0.4465	0	3263
9049	0.02392	0	4403
9061	0.02962	0	4910
9062	0.3022	0	6736
9076	NA	NA	NA
9079	0.3321	0	NA
9081	0.1813	0	5427
9082	0.1392	0	7799
9089	0.5501	1	4715
9092	0.166	0	7142
9094	0.324	0	8909
9115	0.02599	0	4292
9117	0.3096	0	3314
9118	0.222	0	4479
9120	0.06577	0	4442
9124	0.015	0	5019
9128	0.2802	0	7052
9135	0.4415	0	7255
9136	0.7532	1	4784
9138	0.206	0	6181
9157	0.3342	0	4893

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
9176	0.07935	0	5515
9183	0.2604	0	7059
9187	0.4435	0	5223
9188	NA	NA	NA
9190	0.08825	0	4896
9197	0.03688	0	4906
9200	NA	NA	NA
9201	0.1916	0	5605
9203	0.04329	0	4955
9212	0.3732	0	NA
9213	0.1261	0	6747
9214	0.1053	0	4791
9217	0.2421	0	NA
9219	0.00804	0	4323
9220	NA	NA	NA
9221	0.2355	0	5904
9237	0.01137	0	5579
9240	0.2166	0	5393
9241	NA	NA	NA
9248	0.3196	0	5903
9253	0.5256	1	5937
9259	0.653	1	6516
9267	0.123	0	7828
9271	0.318	0	8043
9273	0.222	0	4217
9285	0.05782	0	5811
9290	0.1697	0	5627
9291	0.09845	0	6018
9293	0.03804	0	7113
9294	0.0713	0	5130
9301	NA	NA	NA
9302	0.04199	0	5283
9312	0.01649	0	2861
9316	0.2925	0	5588
9319	NA	NA	NA
9328	NA	NA	NA
9331	0.637	1	2924
9338	0.03824	0	5244
9350	0.2803	0	6673
9356	0.14	0	7459
9359	0.4976	0	5551
9362	0.3584	0	8491
9364	0.1696	0	7856
9370	NA	NA	NA
9380	0.1156	0	NA
9386	0.08842	0	6732
9394	0.3817	0	3650
9407	NA	NA	NA
9411	0.5364	1	8553
9422	NA	NA	NA
9423	0.2331	0	4706
9429	0.2693	0	4831
9433	0.2903	0	6746
9439	NA	NA	NA
9451	0.2769	0	4252
9452	0.4304	0	6442
9453	0.02913	0	2853
9460	NA	NA	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
9465	0.0508	0	5427
9470	0.05306	0	3520
9476	0.4148	0	4545
9485	0.7606	1	4836
9486	0.04545	0	4738
9488	0.3253	0	5371
9507	0.009853	0	3974
9508	0.4014	0	6868
9517	0.4361	0	4428
9521	NA	NA	NA
9528	0.1095	0	6381
9532	0.4352	0	4715
9536	NA	NA	NA
9540	0.05736	0	NA
9542	0.2386	0	6036
9546	0.29	0	6357
9548	0.1185	0	5845
9549	0.1253	0	5486
9554	NA	NA	NA
9555	0.4198	0	5433
9558	0.04894	0	7439
9573	NA	NA	NA
9575	0.7255	1	6446
9584	0.6235	1	6243
9586	0.09117	0	NA
9588	0.119	0	5961
9591	0.345	0	5477
9592	0.7721	1	6312
9597	0.3097	0	5258
9600	NA	NA	NA
9603	0.5389	1	5006
9605	0.3452	0	5066
9614	NA	NA	NA
9616	NA	NA	NA
9622	0.5842	1	4993
9624	0.1553	0	4528
9629	0.5418	1	8132
9633	0.04865	0	6074
9640	0.1784	0	5881
9644	0.3905	0	3507
9645	0.4841	0	4918
9646	0.1761	0	4134
9648	0.944	1	4526
9649	0.05664	0	4414
9660	0.1575	0	7648
9664	0.5752	1	5517
9675	0.09032	0	6067
9679	0.7769	1	3921
9680	0.5163	1	6229
9682	0.07569	0	4695
9697	0.02094	0	5275
9701	0.1502	0	6665
9704	NA	NA	NA
9705	0.09088	0	10178
9707	0.3823	0	3468
9714	0.05054	0	2900
9718	0.1165	0	7035
9722	0.164	0	NA

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
9739	0.1776	0	5845
9747	0.6033	1	5284
9751	0.103	0	3563
9757	0.1169	0	5555
9759	0.02218	0	4241
9760	0.05431	0	4467
9764	0.6818	1	3329
9776	0.3673	0	5864
9778	0.1447	0	5896
9786	0.06316	0	5223
9803	0.4329	0	5296
9804	0.07889	0	4124
9815	0.1113	0	3371
9824	0.0149	0	NA
9825	0.2794	0	5378
9826	0.32	0	7973
9827	0.0168	0	4069
9833	0.1225	0	3939
9835	0.08799	0	4255
9860	0.4045	0	5167
9865	0.2768	0	6938
9871	0.2203	0	9267
9874	0.3189	0	5397
9880	0.2624	0	5553
9882	0.3029	0	9258
9885	0.1066	0	5109
9888	NA	NA	NA
9892	0.02425	0	NA
9893	0.2984	0	6741
9896	0.3259	0	NA
9902	0.1768	0	4259
9906	0.06683	0	NA
9910	0.4343	0	1942
9914	0.2443	0	NA
9918	0.4308	0	NA
9920	0.2631	0	NA
9926	0.3784	0	4546
9931	0.09788	0	NA
9935	0.3427	0	6804
9945	0.854	1	4658
9953	0.2212	0	NA
9957	0.01484	0	6823
9963	0.13	0	6234
9972	0.1778	0	5143
9976	NA	NA	NA
9979	0.5026	1	5954
9980	0.01824	0	5810
9982	0.1512	0	6139
9991	0.6451	1	5359
10000	0.1839	0	4972
10003	0.167	0	NA
10005	0.9337	1	4121
10014	0.01445	0	6349
10032	0.5678	1	5538
10034	NA	NA	NA
10041	0.01599	0	NA
10042	0.03011	0	NA
10044	0.0469	0	3416

Index	Predicted Probability	Predicted Classifcation	Predicted Cost
10045	0.2849	0	3778
10054	0.4123	0	5654
10061	NA	NA	NA
10062	0.4764	0	5161
10073	0.2322	0	3818
10081	0.02793	0	4749
10084	0.3894	0	6047
10086	0.1118	0	8325
10093	0.3716	0	5265
10101	0.6142	1	4890
10105	0.411	0	6507
10110	0.3591	0	5538
10113	0.6011	1	8367
10115	0.5234	1	3635
10119	0.5791	1	NA
10121	0.3985	0	NA
10124	0.8426	1	NA
10126	0.2683	0	4499
10127	NA	NA	NA
10145	0.1125	0	5591
10147	0.5059	1	4720
10148	NA	NA	NA
10162	0.4572	0	2996
10163	0.03793	0	NA
10166	0.7866	1	5541
10172	0.1375	0	4312
10173	0.4826	0	5697
10175	0.02112	0	4263
10180	0.05746	0	2566
10186	NA	NA	NA
10192	0.3808	0	6862
10199	0.3682	0	6076
10209	0.9409	1	5701
10210	0.1499	0	4939
10214	0.05019	0	6621
10215	0.3252	0	6322
10216	0.706	1	5637
10232	0.3777	0	6530
10239	0.3939	0	4943
10249	0.02392	0	NA
10253	NA	NA	NA
10255	0.09654	0	8875
10262	0.02873	0	9119
10264	0.03736	0	2385
10266	0.2502	0	6997
10268	0.2075	0	8082
10271	0.174	0	5516
10272	0.1709	0	NA
10276	0.2947	0	6062
10277	0.05329	0	4552
10279	0.2621	0	3036
10281	0.0423	0	6376
10285	0.004129	0	5104
10294	0.2514	0	6940
10300	0.1303	0	5258

Appendix B: R Code