

DSC_520_week9_Assignment01

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Load Libraries

```
if(!require('foreign')) {  
  install.packages('foreign')  
  library('foreign')  
}
```

```
## Loading required package: foreign
```

```
if(!require('tidyr')) {  
  install.packages('tidyr')  
  library('tidyr')  
}
```

```
## Loading required package: tidyr
```

```
## Warning: package 'tidyr' was built under R version 4.2.1
```

```
install.packages("MASS", repos="http://cran.us.r-project.org")
```

```
## Installing package into 'C:/Users/chris/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)
```

```
## package 'MASS' successfully unpacked and MD5 sums checked  
##
```

```
## The downloaded binary packages are in  
## C:\Users\chris\AppData\Local\Temp\RtmpUpcm3F\downloaded_packages
```

```
library(MASS)
```

```
## Warning: package 'MASS' was built under R version 4.2.1
```

```
## Set the working directory to the root of your DSC 520 directory  
setwd("C:/Users/chris/dsc520/data")
```

```
## Load the `data/r4ds/heights.csv` to
newdata <- read.csv("C:/Users/chris/dsc520/data/binary-classifier-data.csv")
head(newdata)
```

```
##   label      x      y
## 1     0 70.88469 83.17702
## 2     0 74.97176 87.92922
## 3     0 73.78333 92.20325
## 4     0 66.40747 81.10617
## 5     0 69.07399 84.53739
## 6     0 72.23616 86.38403
```

```
newdata2 <-newdata[,c("label","x","y")]
```

```
riskmodel<-glm(label~x+y,family=binomial,data=newdata2)
summary(riskmodel)
```

```
##
## Call:
## glm(formula = label ~ x + y, family = binomial, data = newdata2)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -1.3728  -1.1697  -0.9575   1.1646   1.3989
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  0.424809   0.117224   3.624  0.00029 ***
## x           -0.002571   0.001823  -1.411  0.15836
## y           -0.007956   0.001869  -4.257  2.07e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 2075.8  on 1497  degrees of freedom
## Residual deviance: 2052.1  on 1495  degrees of freedom
## AIC: 2058.1
##
## Number of Fisher Scoring iterations: 4
```

##VARIABLE SELECTION

```
riskmodel_new <- stepAIC(riskmodel)
```

```
## Start:  AIC=2058.07
## label ~ x + y
##
##           Df Deviance    AIC
## - x         1   2054.1 2058.1
## <none>       0   2052.1 2058.1
## - y         1   2070.4 2074.4
##
```

```
## Step: AIC=2058.06
## label ~ y
##
##      Df Deviance   AIC
## <none>    2054.1 2058.1
## - y      1    2075.8 2077.8
```

```
summary(riskmodel_new)
```

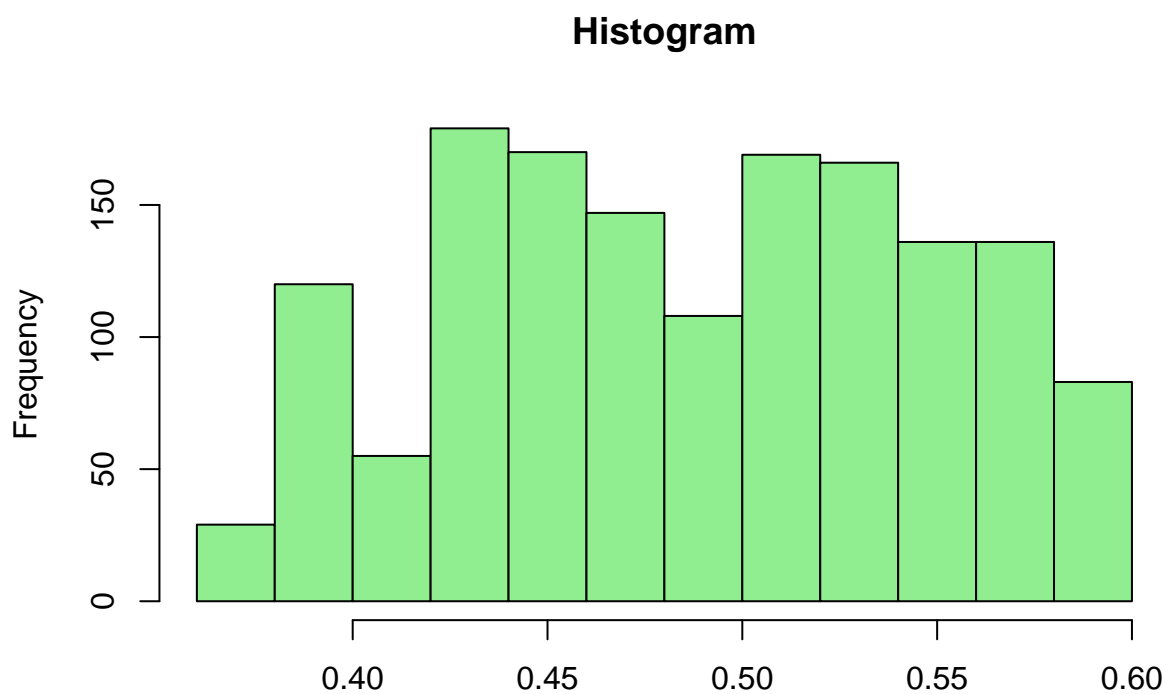
```
##
## Call:
## glm(formula = label ~ y, family = binomial, data = newdata2)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -1.3335  -1.1350  -0.9886   1.1771   1.4287
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  0.332800   0.097188   3.424 0.000616 ***
## y           -0.008480   0.001831  -4.630 3.65e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 2075.8  on 1497  degrees of freedom
## Residual deviance: 2054.1  on 1496  degrees of freedom
## AIC: 2058.1
##
## Number of Fisher Scoring iterations: 4
```

```
##Analysis of the outcome
```

```
summary(newdata2$fitted.values)
```

```
## Length Class Mode
##      0  NULL  NULL
```

```
hist(riskmodel_new$fitted.values,main = " Histogram ",xlab = "", col = 'light green')
```



```
newdata2$Predict <- ifelse(riskmodel_new$fitted.values > 0.5, "0", "1")
newdata2
```

##	label	x	y	Predict
## 1	0	70.884690968	83.17701557	1
## 2	0	74.971763228	87.92921741	1
## 3	0	73.783328766	92.20325437	1
## 4	0	66.407470498	81.10617322	1
## 5	0	69.073994657	84.53738605	1
## 6	0	72.236160394	86.38402567	1
## 7	0	70.925135193	89.73168433	1
## 8	0	77.574540432	98.63424951	1
## 9	0	72.756236407	92.37421911	1
## 10	0	69.036600706	91.74528790	1
## 11	0	67.208283103	85.62171579	1
## 12	0	71.101166845	101.48877174	1
## 13	0	68.017091794	83.81532738	1
## 14	0	72.376287805	89.20003989	1
## 15	0	70.702604459	86.51170828	1
## 16	0	69.236802656	89.98705443	1
## 17	0	65.371376946	83.04975843	1
## 18	0	69.160437175	91.30133223	1
## 19	0	73.846898471	93.36842572	1
## 20	0	69.521713484	89.94500517	1
## 21	0	67.951244261	91.79680951	1
## 22	0	72.702600399	92.32403820	1

## 23	0	67.473153040	86.56904590	1
## 24	0	66.261353495	90.76869718	1
## 25	0	75.578148088	91.81035164	1
## 26	0	68.410285087	85.32959091	1
## 27	0	68.093818194	91.80961287	1
## 28	0	76.106788991	86.92784070	1
## 29	0	65.161240473	80.77939756	1
## 30	0	65.779942637	88.73708352	1
## 31	0	69.544184783	82.12866340	1
## 32	0	71.997459723	78.86599310	1
## 33	0	67.139472138	88.06050053	1
## 34	0	72.521797778	81.78211506	1
## 35	0	68.494245276	82.44224160	1
## 36	0	73.627039067	86.19587132	1
## 37	0	68.601449383	84.93345289	1
## 38	0	81.065592562	92.99034733	1
## 39	0	68.155758405	83.97527461	1
## 40	0	64.371898705	86.22893521	1
## 41	0	67.905321976	93.47074136	1
## 42	0	72.374338529	80.93594197	1
## 43	0	70.796696620	90.86586943	1
## 44	0	64.997270200	85.80802466	1
## 45	0	67.246225819	88.50707958	1
## 46	0	67.527688260	98.87718070	1
## 47	0	73.173629782	96.58676805	1
## 48	0	80.034574431	91.47279044	1
## 49	0	71.407892930	90.15792310	1
## 50	0	68.694956978	89.33047854	1
## 51	0	71.280803989	84.72027336	1
## 52	0	67.541851122	85.54941820	1
## 53	0	70.981231268	93.74373370	1
## 54	0	67.010649793	83.36586161	1
## 55	0	71.413610465	90.11751130	1
## 56	0	48.483907267	40.06837598	1
## 57	0	49.057638960	38.49490904	0
## 58	0	49.039123720	39.83932457	1
## 59	0	50.172052537	43.06784662	1
## 60	0	48.874239495	42.09334715	1
## 61	0	49.144735580	37.78847529	0
## 62	0	48.401257658	42.33842638	1
## 63	0	48.672013702	39.54598494	1
## 64	0	47.146643543	45.14718573	1
## 65	0	50.022143358	45.69452387	1
## 66	0	49.252810927	42.64397251	1
## 67	0	49.099910501	40.07400160	1
## 68	0	49.203968059	33.66104828	0
## 69	0	47.836372249	43.82052271	1
## 70	0	49.657516284	42.55331300	1
## 71	0	48.263287921	35.64446924	0
## 72	0	49.737899456	38.84590845	0
## 73	0	49.643049611	45.91976022	1
## 74	0	47.162205637	47.57487826	1
## 75	0	48.674940112	43.56254645	1
## 76	0	46.130589454	42.06876013	1

## 77	0	48.734620071	40.56962586	1
## 78	0	47.896460648	44.92116226	1
## 79	0	48.299248604	35.40605840	0
## 80	0	48.743382685	37.14650230	0
## 81	0	48.740282490	36.52424644	0
## 82	0	45.055788024	45.21615177	1
## 83	0	48.679893657	37.87499781	0
## 84	0	47.586881270	38.75329127	0
## 85	0	49.053408211	36.47429664	0
## 86	0	48.007528585	44.83578536	1
## 87	0	48.139133319	43.73264388	1
## 88	0	46.096509291	36.21655624	0
## 89	0	49.229161435	39.46245715	1
## 90	0	47.673405671	39.54826367	1
## 91	0	47.774312598	30.91092700	0
## 92	0	47.328235419	37.03311622	0
## 93	0	47.099390226	42.39615990	1
## 94	0	49.682167239	36.63031366	0
## 95	0	50.472839180	43.83972291	1
## 96	0	48.834130524	41.56444321	1
## 97	0	49.621587974	47.53151307	1
## 98	0	49.518665134	47.50066326	1
## 99	0	42.110562278	75.67910221	1
## 100	0	48.382021745	72.42181932	1
## 101	0	45.653517283	73.05771030	1
## 102	0	43.577761798	72.78652090	1
## 103	0	40.565872292	74.84798187	1
## 104	0	42.058328298	75.04874662	1
## 105	0	47.477059656	74.87967588	1
## 106	0	40.739344213	76.31974656	1
## 107	0	41.953329409	73.47731677	1
## 108	0	41.504925690	74.40347216	1
## 109	0	41.872817066	76.81666756	1
## 110	0	44.944212144	75.38936697	1
## 111	0	47.796494889	74.72165188	1
## 112	0	43.275995031	74.38732062	1
## 113	0	44.873221034	73.78029284	1
## 114	0	39.424699479	74.43206857	1
## 115	0	43.722726553	75.49388879	1
## 116	0	41.229400463	74.80721039	1
## 117	0	38.814797999	74.48936759	1
## 118	0	43.152317265	71.34146216	1
## 119	0	44.196718723	72.96087891	1
## 120	0	49.546307347	74.53042261	1
## 121	0	44.707617440	74.53150375	1
## 122	0	45.487674861	74.57982888	1
## 123	0	45.535699455	74.56817305	1
## 124	0	43.342694327	75.39871954	1
## 125	0	45.199291962	73.79459861	1
## 126	0	40.901355806	73.21486770	1
## 127	0	45.230981215	72.24428396	1
## 128	0	43.004952168	74.50557606	1
## 129	0	41.100788144	75.48428201	1
## 130	0	42.476166686	75.30344168	1

## 131	0	44.609054376	73.41015736	1
## 132	0	41.172960215	75.07450603	1
## 133	0	48.155473548	74.07028651	1
## 134	0	49.002572608	75.19068879	1
## 135	0	44.703213302	74.79381028	1
## 136	0	44.552515990	74.15002588	1
## 137	0	43.102613025	74.43023153	1
## 138	0	43.594511078	74.78623738	1
## 139	0	45.842074296	75.45923413	1
## 140	0	44.584670881	73.61680338	1
## 141	0	39.787982976	76.06402060	1
## 142	0	44.308645454	73.24743033	1
## 143	0	41.298517670	76.06712165	1
## 144	0	41.242810174	73.26564424	1
## 145	0	42.298889605	74.08419387	1
## 146	0	43.842156772	75.60740051	1
## 147	0	41.783336855	75.13428004	1
## 148	0	46.889547079	74.09267686	1
## 149	0	41.636132046	76.38195411	1
## 150	0	44.413558290	74.92747623	1
## 151	0	45.682254623	72.99852502	1
## 152	0	43.760486513	74.43425905	1
## 153	0	40.961792439	74.54250561	1
## 154	0	41.758762510	76.22631593	1
## 155	0	43.718994827	74.92542133	1
## 156	0	37.821079829	73.36466002	1
## 157	0	41.760450122	74.14467130	1
## 158	0	41.771882731	73.63905408	1
## 159	0	44.338971789	75.84285402	1
## 160	0	46.516810617	73.18026994	1
## 161	0	96.653153990	64.07243515	1
## 162	0	91.738666374	65.17427668	1
## 163	0	97.918467457	61.96317286	1
## 164	0	94.554581086	63.67412334	1
## 165	0	98.059956917	61.90060000	1
## 166	0	93.297480204	63.86145848	1
## 167	0	95.341631466	59.33905429	1
## 168	0	94.048842596	74.09198065	1
## 169	0	97.558320440	60.80933796	1
## 170	0	97.693269332	63.22127695	1
## 171	0	88.513876082	58.72069448	1
## 172	0	95.084372807	61.99645529	1
## 173	0	93.806389355	62.02356894	1
## 174	0	97.099995345	58.23515314	1
## 175	0	96.204672746	61.62066547	1
## 176	0	92.452281835	65.58098099	1
## 177	0	95.429405866	58.41561207	1
## 178	0	97.923411384	61.38051666	1
## 179	0	94.542278487	60.10048163	1
## 180	0	93.401927840	67.63076709	1
## 181	0	94.874329854	71.66537184	1
## 182	0	92.450275533	65.94468410	1
## 183	0	93.384230094	66.93471410	1
## 184	0	90.887312233	60.03321961	1

## 185	0	92.891406651	61.51275912	1
## 186	0	89.845419021	59.68942505	1
## 187	0	90.424975613	65.32529413	1
## 188	0	92.923445507	63.51318676	1
## 189	0	93.075959883	58.03310219	1
## 190	0	94.955556075	70.43940805	1
## 191	0	92.940506451	64.47822890	1
## 192	0	92.540439921	64.95039396	1
## 193	0	96.278227927	65.14047900	1
## 194	0	95.780065572	70.98647162	1
## 195	0	95.846773082	60.30649332	1
## 196	0	96.078054446	67.45204488	1
## 197	0	14.102187155	59.78771805	1
## 198	0	17.215832874	60.59492993	1
## 199	0	12.117217197	58.93871420	1
## 200	0	14.830302801	60.78093171	1
## 201	0	10.135968573	60.34563536	1
## 202	0	16.367057654	59.00259798	1
## 203	0	10.779380988	59.85035452	1
## 204	0	14.766091661	59.38582697	1
## 205	0	13.243711641	57.94596508	1
## 206	0	12.474912629	56.51208675	1
## 207	0	11.381509799	60.49654964	1
## 208	0	11.754786804	58.53487477	1
## 209	0	7.920728463	58.77736222	1
## 210	0	13.465555539	60.33333583	1
## 211	0	18.726562690	62.19570237	1
## 212	0	10.066346463	58.24107519	1
## 213	0	15.632397858	59.83990134	1
## 214	0	12.222545374	61.86700122	1
## 215	0	13.616695096	61.10449695	1
## 216	0	12.006713156	58.20434901	1
## 217	0	16.100274480	58.89830844	1
## 218	0	18.532793355	56.63622682	1
## 219	0	5.825513990	59.37526683	1
## 220	0	16.998922111	59.41882178	1
## 221	0	17.244666802	60.35761472	1
## 222	0	16.239249646	58.95575102	1
## 223	0	60.146153899	94.32770088	1
## 224	0	59.347434455	92.28614528	1
## 225	0	57.940940744	96.27850571	1
## 226	0	58.127825458	93.99134793	1
## 227	0	57.392332560	89.27694162	1
## 228	0	59.680729907	94.88526444	1
## 229	0	60.383547370	89.80834506	1
## 230	0	57.752358783	94.51013345	1
## 231	0	56.476353204	94.32542552	1
## 232	0	58.084976344	92.66263738	1
## 233	0	58.349554211	94.91807891	1
## 234	0	56.098771765	92.11809090	1
## 235	0	58.195487270	98.49940204	1
## 236	0	59.029863439	91.04191266	1
## 237	0	62.023651069	86.93962712	1
## 238	0	55.416979527	90.16804679	1

## 239	0	54.937833983	95.90463651	1
## 240	0	61.999684982	93.54841379	1
## 241	0	62.770504824	87.36480941	1
## 242	0	62.438871648	91.64718621	1
## 243	0	60.008253114	98.97360991	1
## 244	0	56.199150998	89.18967838	1
## 245	0	59.039483779	91.50169042	1
## 246	0	56.133214428	92.73613584	1
## 247	0	58.453284457	95.82659909	1
## 248	0	60.254860323	90.52848114	1
## 249	0	59.910637497	88.29815950	1
## 250	0	56.164020653	91.40711495	1
## 251	0	59.782748705	92.68129416	1
## 252	0	62.331766595	87.76204052	1
## 253	0	60.266280654	84.79925928	1
## 254	0	59.970595469	95.03017211	1
## 255	0	59.043290929	91.70828497	1
## 256	0	59.609037515	89.36148475	1
## 257	0	59.505714887	86.66187004	1
## 258	0	57.569515334	93.70263646	1
## 259	0	60.171788654	93.70775632	1
## 260	0	47.002127091	22.10234534	0
## 261	0	45.199257397	21.23650309	0
## 262	0	48.836295513	21.06610370	0
## 263	0	42.025137396	19.58627389	0
## 264	0	44.081930679	20.85607017	0
## 265	0	47.370825101	18.65221668	0
## 266	0	44.571800088	18.42331667	0
## 267	0	43.539213681	19.21951427	0
## 268	0	40.505562133	20.67329583	0
## 269	0	46.199076521	21.70881897	0
## 270	0	46.676195074	23.85622174	0
## 271	0	50.368373503	17.98462671	0
## 272	0	43.991315267	17.96644870	0
## 273	0	44.520450090	23.12917483	0
## 274	0	44.114215911	21.29983468	0
## 275	0	43.482044408	22.13016388	0
## 276	0	44.768845483	19.70530032	0
## 277	0	44.919865738	17.94112767	0
## 278	0	49.534415851	20.46988436	0
## 279	0	45.677902766	18.32674944	0
## 280	0	41.179166105	21.46658248	0
## 281	0	44.861798230	18.99971954	0
## 282	0	43.022963352	19.12716594	0
## 283	0	46.474867901	19.75740427	0
## 284	0	40.654978139	21.18137927	0
## 285	0	47.687614181	20.60782734	0
## 286	0	45.432576304	20.79896849	0
## 287	0	44.333522296	19.06727653	0
## 288	0	41.215133789	17.16917057	0
## 289	0	42.106121644	19.51060785	0
## 290	0	44.615439055	20.68553694	0
## 291	0	40.925696762	20.11998970	0
## 292	0	41.330070403	20.85500981	0

## 293	0	46.080816008	20.66103364	0
## 294	0	46.845819671	16.90841197	0
## 295	0	43.278807546	15.74258202	0
## 296	0	36.332139285	20.47502527	0
## 297	0	41.162469321	20.41775597	0
## 298	0	39.471712826	20.09227748	0
## 299	0	46.686923633	21.84593035	0
## 300	0	43.347998016	19.64484426	0
## 301	0	41.244239608	19.51689514	0
## 302	0	53.386184291	22.65660802	0
## 303	0	52.215307328	20.45059390	0
## 304	0	48.861966094	22.31830099	0
## 305	0	43.821087086	21.95194315	0
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## 307	0	45.031631099	19.92430547	0
## 308	0	43.155435941	15.81137667	0
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## 310	0	43.915575805	20.77572589	0
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## 312	0	45.046372614	17.14246815	0
## 313	0	44.867473620	17.76323951	0
## 314	0	3.620150553	54.33325172	1
## 315	0	13.774977435	60.25871075	1
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## 318	0	13.971128866	53.29069276	1
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## 321	0	9.630278514	50.94223182	1
## 322	0	9.822310902	53.67920088	1
## 323	0	9.168418735	50.90326429	1
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## 327	0	5.548768188	53.58763193	1
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## 330	0	2.263850975	52.68332019	1
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## 339	0	13.699367738	57.26101298	1
## 340	0	5.263150408	53.90586521	1
## 341	0	0.784548813	54.05734829	1
## 342	0	10.458154014	50.97191261	1
## 343	0	12.614737626	51.64865915	1
## 344	0	5.778474130	53.34590197	1
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## 350	0	9.088602390	52.51694242	1
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## 352	0	5.787933624	53.83020028	1
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## 499	0	-1.991629484	-0.64480866	0
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## 504	0	2.184794635	-1.19679177	0
## 505	0	3.631547198	-0.91895992	0
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## 507	0	-3.072394086	0.50857131	0
## 508	0	6.723862419	-2.62923717	0

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## 513	0	-1.049711299	-1.38795286	0
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## 684	0	5.416014355	53.26903455	1
## 685	0	4.873908658	64.23632436	1
## 686	0	6.748676742	66.69890018	1
## 687	0	1.906849312	53.73776075	1
## 688	0	2.588505036	59.24002468	1
## 689	0	4.536617625	56.17413914	1
## 690	0	0.723871963	48.94658383	1
## 691	0	0.598018117	56.92387740	1
## 692	0	9.181423461	51.93604459	1
## 693	0	0.335797013	56.29955201	1
## 694	0	8.942328543	58.16385417	1
## 695	0	-0.802080463	63.16702779	1
## 696	0	2.533514308	54.91855939	1
## 697	0	-0.161249348	49.61590291	1
## 698	0	1.056347060	58.87173294	1
## 699	0	4.475035280	58.97923525	1
## 700	0	-0.980014497	76.26257543	1
## 701	0	6.428534072	61.23032955	1
## 702	0	1.279627592	51.48058344	1
## 703	0	4.661916116	64.12032895	1
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## 705	0	3.320606790	56.77637392	1
## 706	0	1.095312655	59.72725183	1
## 707	0	1.490995382	68.30690878	1
## 708	0	0.744330030	53.32148396	1
## 709	0	-0.626121742	57.06980017	1
## 710	0	0.808451642	63.54416613	1
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## 712	0	0.056642086	53.22522797	1
## 713	0	2.845202010	57.92376606	1
## 714	0	101.561101688	86.58494838	1
## 715	0	102.435607932	89.48920584	1
## 716	0	98.805764842	89.99521802	1
## 717	0	97.319561728	86.51887661	1
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## 721	0	98.742962955	89.85132624	1
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## 724	0	97.235812115	89.03258331	1

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## 1410	1	8.721650166	-0.39432199	0
## 1411	1	12.527526373	-0.43197204	0
## 1412	1	10.600337372	3.79345447	0
## 1413	1	11.308509028	7.24174598	0
## 1414	1	14.171927510	5.47521538	0
## 1415	1	14.183766831	9.60671833	0
## 1416	1	11.575181183	6.09554400	0
## 1417	1	9.899573837	9.67960943	0
## 1418	1	12.981794645	10.21373757	0
## 1419	1	15.914058401	8.26887483	0
## 1420	1	8.422408040	7.51168035	0
## 1421	1	11.986458904	13.37089792	0
## 1422	1	11.268813016	10.63254942	0
## 1423	1	15.526105543	6.13381070	0
## 1424	1	12.706267171	7.21576599	0
## 1425	1	13.556229189	7.01146303	0
## 1426	1	10.823970837	4.81308140	0

## 1427	1	17.921718855	10.18767884	0
## 1428	1	16.188923010	2.83705436	0
## 1429	1	10.117039441	6.82374667	0
## 1430	1	12.217564711	3.95658894	0
## 1431	1	11.048931602	10.51984815	0
## 1432	1	15.659788452	11.51756293	0
## 1433	1	12.753938914	8.36446765	0
## 1434	1	12.930005538	11.98524488	0
## 1435	1	9.229828367	10.35987312	0
## 1436	1	11.218038249	4.94335047	0
## 1437	1	5.322096891	2.21570499	0
## 1438	1	12.398066620	6.47687229	0
## 1439	1	12.977994560	18.02677682	0
## 1440	1	13.179170548	6.16580397	0
## 1441	1	12.648359187	9.36436712	0
## 1442	1	12.746873224	-0.23035497	0
## 1443	1	14.134025494	3.83339897	0
## 1444	1	9.795702140	-0.14246717	0
## 1445	1	9.807524696	10.90093425	0
## 1446	1	10.201965430	3.62202015	0
## 1447	1	11.421372357	17.17808410	0
## 1448	1	9.234196171	12.52426979	0
## 1449	1	15.805117422	15.94179001	0
## 1450	1	12.453444566	11.36225506	0
## 1451	1	10.995035441	6.54832238	0
## 1452	1	7.919653523	11.58614027	0
## 1453	1	9.881853629	1.63145590	0
## 1454	1	15.713390385	6.99849858	0
## 1455	1	40.923401908	99.91189756	1
## 1456	1	38.537629208	91.64468157	1
## 1457	1	29.335288765	101.97577796	1
## 1458	1	42.384607578	93.28024880	1
## 1459	1	31.846083126	97.79156375	1
## 1460	1	34.340623113	101.02330252	1
## 1461	1	33.435780949	100.18689320	1
## 1462	1	38.741605647	98.83100598	1
## 1463	1	34.839538593	98.84522366	1
## 1464	1	27.430057660	99.66445614	1
## 1465	1	36.830586042	94.97758819	1
## 1466	1	33.567675881	95.98893789	1
## 1467	1	31.699373374	106.89555755	1
## 1468	1	30.919527091	100.54771155	1
## 1469	1	35.546882210	102.10574242	1
## 1470	1	34.057638500	98.36429013	1
## 1471	1	31.697807312	100.54793499	1
## 1472	1	35.100667725	93.61943644	1
## 1473	1	36.279093081	90.05672558	1
## 1474	1	26.598914424	98.50740492	1
## 1475	1	33.094437768	99.03889695	1
## 1476	1	30.799802023	96.82094769	1
## 1477	1	37.361847470	97.75067682	1
## 1478	1	37.390068231	97.76702516	1
## 1479	1	27.525655486	91.57704494	1
## 1480	1	34.425154956	90.99273937	1

```
## 1481      1  24.898159964  98.87844431      1
## 1482      1  32.518557953  88.65248384      1
## 1483      1  37.087332990  94.18571752      1
## 1484      1  33.742691764  95.68669261      1
## 1485      1  27.583199044  92.22107614      1
## 1486      1  40.663859748  92.58390170      1
## 1487      1  35.401847086  93.48607792      1
## 1488      1  36.876360479  93.77507730      1
## 1489      1  28.885759188  98.25351827      1
## 1490      1  40.848137054 100.81071383      1
## 1491      1  27.996671529  93.75367945      1
## 1492      1  33.202854211  97.81389232      1
## 1493      1  37.354986758  96.79135843      1
## 1494      1  26.259823260 102.32467500      1
## 1495      1  36.351242528 101.25380414      1
## 1496      1  38.997386799  90.57554585      1
## 1497      1  37.739718368 102.51357633      1
## 1498      1  33.470462689  95.61268248      1
```

##Model Performance Evaluation

```
riskmodel$aic
```

```
## [1] 2058.067
```

```
riskmodel_new$aic
```

```
## [1] 2058.06
```

CONCLUSION : A model with minimum AIC value is preferred.The above shows the AIC of the original model

##Confusion Matrix

```
mytable <- table(newdata2$label,newdata2$Predict)
mytable
```

```
##
##      0      1
## 0 333 434
## 1 357 374
```

```
efficiency <- sum(diag(mytable))/sum(mytable)
efficiency
```

```
## [1] 0.4719626
```

CONCLUSION: The accuracy of our model is 47.1%