R Notebook

## -- Attaching packages ---------------------------------------- tidyverse 1.2.1 --

## v ggplot2 3.0.0 v purrr 0.2.5  
## v tibble 1.4.2 v dplyr 0.7.6  
## v tidyr 0.8.1 v stringr 1.3.1  
## v readr 1.1.1 v forcats 0.3.0

## -- Conflicts ------------------------------------------- tidyverse\_conflicts() --  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag() masks stats::lag()

##   
## Attaching package: 'xtable'

## The following objects are masked from 'package:summarytools':  
##   
## label, label<-

##   
## Attaching package: 'pastecs'

## The following objects are masked from 'package:dplyr':  
##   
## first, last

## The following object is masked from 'package:tidyr':  
##   
## extract

##   
## Attaching package: 'magrittr'

## The following object is masked from 'package:pastecs':  
##   
## extract

## The following object is masked from 'package:purrr':  
##   
## set\_names

## The following object is masked from 'package:tidyr':  
##   
## extract

##   
## Please cite as:

## Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables.

## R package version 5.2.2. https://CRAN.R-project.org/package=stargazer

## Parsed with column specification:  
## cols(  
## MARRIED = col\_character(),  
## GDLIN = col\_integer(),  
## OBRAT = col\_double(),  
## BLACK = col\_integer(),  
## HISPAN = col\_integer(),  
## MALE = col\_character(),  
## APPROVE = col\_integer(),  
## LOANPRC = col\_double()  
## )

## MARRIED GDLIN OBRAT BLACK   
## Length:1989 Min. : 0.000 Min. : 0.00 Min. :0.00000   
## Class :character 1st Qu.: 1.000 1st Qu.:28.00 1st Qu.:0.00000   
## Mode :character Median : 1.000 Median :33.00 Median :0.00000   
## Mean : 1.583 Mean :32.39 Mean :0.09904   
## 3rd Qu.: 1.000 3rd Qu.:37.00 3rd Qu.:0.00000   
## Max. :666.000 Max. :95.00 Max. :1.00000   
## HISPAN MALE APPROVE LOANPRC   
## Min. :0.00000 Length:1989 Min. :0.0000 Min. :0.02105   
## 1st Qu.:0.00000 Class :character 1st Qu.:1.0000 1st Qu.:0.70000   
## Median :0.00000 Mode :character Median :1.0000 Median :0.80000   
## Mean :0.05581 Mean :0.8773 Mean :0.77064   
## 3rd Qu.:0.00000 3rd Qu.:1.0000 3rd Qu.:0.89894   
## Max. :1.00000 Max. :1.0000 Max. :2.57143

mld <- raw\_data %>%  
 filter(GDLIN != 666, MALE != ".", MARRIED !=".") %>%  
 mutate( MARRIED = factor(MARRIED),  
 GDLIN = factor(GDLIN),  
 BLACK = factor(BLACK),  
 HISPAN = factor(HISPAN),  
 MALE = factor(MALE),  
 APPROVE = factor(APPROVE))  
  
summary(mld)

## MARRIED GDLIN OBRAT BLACK HISPAN MALE APPROVE   
## 0: 671 0: 171 Min. : 0.00 0:1774 0:1861 0: 368 0: 244   
## 1:1298 1:1798 1st Qu.:28.00 1: 195 1: 108 1:1601 1:1725   
## Median :33.00   
## Mean :32.39   
## 3rd Qu.:37.00   
## Max. :95.00   
## LOANPRC   
## Min. :0.02105   
## 1st Qu.:0.70000   
## Median :0.80000   
## Mean :0.77032   
## 3rd Qu.:0.89888   
## Max. :2.57143

Descriptive statistic

summary(mld\_black)

## MARRIED GDLIN OBRAT MALE APPROVE LOANPRC   
## 0: 75 0: 53 Min. : 5.60 0: 51 0: 64 Min. :0.2899   
## 1:120 1:142 1st Qu.:31.00 1:144 1:131 1st Qu.:0.8000   
## Median :35.00 Median :0.8750   
## Mean :34.90 Mean :0.8406   
## 3rd Qu.:38.85 3rd Qu.:0.9024   
## Max. :63.00 Max. :2.5552

summary(mld\_black)

## MARRIED GDLIN OBRAT MALE APPROVE LOANPRC   
## 0: 75 0: 53 Min. : 5.60 0: 51 0: 64 Min. :0.2899   
## 1:120 1:142 1st Qu.:31.00 1:144 1:131 1st Qu.:0.8000   
## Median :35.00 Median :0.8750   
## Mean :34.90 Mean :0.8406   
## 3rd Qu.:38.85 3rd Qu.:0.9024   
## Max. :63.00 Max. :2.5552

summary(mld\_black)

## MARRIED GDLIN OBRAT MALE APPROVE LOANPRC   
## 0: 75 0: 53 Min. : 5.60 0: 51 0: 64 Min. :0.2899   
## 1:120 1:142 1st Qu.:31.00 1:144 1:131 1st Qu.:0.8000   
## Median :35.00 Median :0.8750   
## Mean :34.90 Mean :0.8406   
## 3rd Qu.:38.85 3rd Qu.:0.9024   
## Max. :63.00 Max. :2.5552

#Overall Descriptive Statistic ###Approve

mld %>%  
 tabyl(APPROVE) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Approve", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Approve

Count

Percent

0

244

12.4%

1

1725

87.6%

###Married

mld %>%  
 tabyl(MARRIED) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Married", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Married

Count

Percent

0

671

34.1%

1

1298

65.9%

Total

1969

100.0%

###GLIND

mld %>%  
 tabyl(GDLIN) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Guideline", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Guideline

Count

Percent

0

171

8.7%

1

1798

91.3%

Total

1969

100.0%

###Black

mld %>%  
 tabyl(BLACK) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Black", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Black

Count

Percent

0

1774

90.1%

1

195

9.9%

Total

1969

100.0%

### Hispan

mld %>%  
 tabyl(HISPAN) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Hispan", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Hispan

Count

Percent

0

1861

94.5%

1

108

5.5%

Total

1969

100.0%

### Male

mld %>%  
 tabyl(MALE) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Male", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Male

Count

Percent

0

368

18.7%

1

1601

81.3%

Total

1969

100.0%

### Other obligation

desc\_tab<-rbind(c(min(mld$OBRAT), mean(mld$OBRAT), max(mld$OBRAT), sd(mld$OBRAT)),  
 c(min(mld$LOANPRC), mean(mld$LOANPRC), max(mld$LOANPRC), sd(mld$LOANPRC)))   
row.names(desc\_tab) <- c("Other Obligation", "Loan amount/purchase")   
  
desc\_tab %>% round(2) %>%  
 kableExtra::kable(col.names = c("Min", "Mean", "Max", "Standard Deviation")) %>%   
 kable\_styling(full\_width = FALSE)

Min

Mean

Max

Standard Deviation

Other Obligation

0.00

32.39

95.00

8.28

Loan amount/purchase

0.02

0.77

2.57

0.19

# Black subset Descriptive Statistic

### Approve

mld\_black %>%  
 tabyl(APPROVE) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Approve", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Approve

Count

Percent

0

64

32.8%

1

131

67.2%

### Married

mld\_black %>%  
 tabyl(MARRIED) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Married", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Married

Count

Percent

0

75

38.5%

1

120

61.5%

Total

195

100.0%

### GLIND

mld\_black %>%  
 tabyl(GDLIN) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Guideline", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Guideline

Count

Percent

0

53

27.2%

1

142

72.8%

Total

195

100.0%

### Male

mld\_black %>%  
 tabyl(MALE) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Male", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Male

Count

Percent

0

51

26.2%

1

144

73.8%

Total

195

100.0%

### Other obligation

desc\_tab<-rbind(c(min(mld\_black$OBRAT), mean(mld\_black$OBRAT), max(mld\_black$OBRAT), sd(mld\_black$OBRAT)),  
 c(min(mld\_black$LOANPRC), mean(mld\_black$LOANPRC), max(mld\_black$LOANPRC), sd(mld\_black$LOANPRC)))   
row.names(desc\_tab) <- c("Other Obligation", "Loan amount/purchase")   
  
desc\_tab %>% round(2) %>%  
 kableExtra::kable(col.names = c("Min", "Mean", "Max", "Standard Deviation")) %>%   
 kable\_styling(full\_width = FALSE)

Min

Mean

Max

Standard Deviation

Other Obligation

5.60

34.90

63.00

8.19

Loan amount/purchase

0.29

0.84

2.56

0.18

# Hispan subset Descriptive Statistic

### Approve

mld\_hispan %>%  
 tabyl(APPROVE) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Approve", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Approve

Count

Percent

0

26

24.1%

1

82

75.9%

### Married

mld\_hispan %>%  
 tabyl(MARRIED) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Married", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Married

Count

Percent

0

31

28.7%

1

77

71.3%

Total

108

100.0%

### GLIND

mld\_hispan %>%  
 tabyl(GDLIN) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Guideline", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Guideline

Count

Percent

0

16

14.8%

1

92

85.2%

Total

108

100.0%

### Male

mld\_hispan %>%  
 tabyl(MALE) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Male", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Male

Count

Percent

0

22

20.4%

1

86

79.6%

Total

108

100.0%

### Other obligation

desc\_tab<-rbind(c(min(mld\_hispan$OBRAT), mean(mld\_hispan$OBRAT), max(mld\_hispan$OBRAT), sd(mld\_hispan$OBRAT)),  
 c(min(mld\_hispan$LOANPRC), mean(mld\_hispan$LOANPRC), max(mld\_hispan$LOANPRC), sd(mld\_hispan$LOANPRC)))   
row.names(desc\_tab) <- c("Other Obligation", "Loan amount/purchase")   
  
desc\_tab %>% round(2) %>%  
 kableExtra::kable(col.names = c("Min", "Mean", "Max", "Standard Deviation")) %>%   
 kable\_styling(full\_width = FALSE)

Min

Mean

Max

Standard Deviation

Other Obligation

14.6

33.47

62.00

8.46

Loan amount/purchase

0.4

0.86

1.63

0.14

# White subset Descriptive Statistic

### Approve

mld\_white %>%  
 tabyl(APPROVE) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Approve", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Approve

Count

Percent

0

154

9.2%

1

1512

90.8%

### Married

mld\_white %>%  
 tabyl(MARRIED) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Married", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Married

Count

Percent

0

565

33.9%

1

1101

66.1%

Total

1666

100.0%

### GLIND

mld\_white %>%  
 tabyl(GDLIN) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Guideline", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Guideline

Count

Percent

0

102

6.1%

1

1564

93.9%

Total

1666

100.0%

### Male

mld\_white %>%  
 tabyl(MALE) %>%  
 adorn\_totals(where = c("row")) %>%  
 adorn\_pct\_formatting() %>%   
 kableExtra::kable(col.names = c("Male", "Count", "Percent")) %>%   
 kable\_styling(full\_width = FALSE)

Male

Count

Percent

0

295

17.7%

1

1371

82.3%

Total

1666

100.0%

### Other obligation

desc\_tab<-rbind(c(min(mld\_white$OBRAT), mean(mld\_white$OBRAT), max(mld\_white$OBRAT), sd(mld\_white$OBRAT)),  
 c(min(mld\_white$LOANPRC), mean(mld\_white$LOANPRC), max(mld\_white$LOANPRC), sd(mld\_white$LOANPRC)))   
row.names(desc\_tab) <- c("Other Obligation", "Loan amount/purchase")   
  
desc\_tab %>% round(2) %>%  
 kableExtra::kable(col.names = c("Min", "Mean", "Max", "Standard Deviation")) %>%   
 kable\_styling(full\_width = FALSE)

Min

Mean

Max

Standard Deviation

Other Obligation

0.00

32.03

95.00

8.23

Loan amount/purchase

0.02

0.76

2.57

0.19

# Estimate Logit Model

LogitOverallModel = glm(APPROVE ~ . , data = mld,   
 family = "binomial")  
summary(LogitOverallModel)

##   
## Call:  
## glm(formula = APPROVE ~ ., family = "binomial", data = mld)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -2.8933 0.2445 0.3128 0.3742 2.3261   
##   
## Coefficients:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) 1.38153 0.59166 2.335 0.019542 \*   
## MARRIED1 0.47574 0.19201 2.478 0.013221 \*   
## GDLIN1 3.71927 0.21717 17.126 < 2e-16 \*\*\*  
## OBRAT -0.03407 0.01031 -3.305 0.000950 \*\*\*  
## BLACK1 -0.81569 0.24018 -3.396 0.000683 \*\*\*  
## HISPAN1 -0.90001 0.31058 -2.898 0.003758 \*\*   
## MALE1 -0.05395 0.23457 -0.230 0.818107   
## LOANPRC -1.68119 0.50739 -3.313 0.000922 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for binomial family taken to be 1)  
##   
## Null deviance: 1475.4 on 1968 degrees of freedom  
## Residual deviance: 959.4 on 1961 degrees of freedom  
## AIC: 975.4  
##   
## Number of Fisher Scoring iterations: 6

#Generate Odds Ratios  
exp(coef(LogitOverallModel))

## (Intercept) MARRIED1 GDLIN1 OBRAT BLACK1 HISPAN1   
## 3.9809925 1.6092076 41.2342404 0.9665001 0.4423326 0.4065655   
## MALE1 LOANPRC   
## 0.9474819 0.1861531

#Define prototypical loan applicants (you will need more than 3)  
prototype1 <- data.frame(MARRIED = "0", GDLIN = "1", OBRAT=mean(mld$OBRAT), BLACK = "1", HISPAN = "0", MALE = "1",LOANPRC = 0.9)  
prototype2 <- data.frame(MARRIED = "0", GDLIN = "1", OBRAT=mean(mld$OBRAT), BLACK = "1", HISPAN = "0", MALE = "0", LOANPRC = 0.9)  
prototype3 <- data.frame(OBRAT=mean(mld$OBRAT),BLACK = 0, HISPAN = 0)

prototype1$predictedprob <- predict (LogitOverallModel, newdata = prototype1, type ="response")  
prototype1

## MARRIED GDLIN OBRAT BLACK HISPAN MALE LOANPRC predictedprob  
## 1 0 1 32.39172 1 0 1 0.9 0.8340185

prototype2$predictedprob <- predict (LogitOverallModel, newdata = prototype2, type ="response")  
prototype2

## MARRIED GDLIN OBRAT BLACK HISPAN MALE LOANPRC predictedprob  
## 1 0 1 32.39172 1 0 0 0.9 0.8413526

# Estimate Probit Model

ProbitModel = glm(APPROVE ~., data = mld,   
 family = "binomial" (link = "probit"))  
summary(ProbitModel)

##   
## Call:  
## glm(formula = APPROVE ~ ., family = binomial(link = "probit"),   
## data = mld)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -2.9694 0.2361 0.3119 0.3762 2.2711   
##   
## Coefficients:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) 0.566210 0.309521 1.829 0.067353 .   
## MARRIED1 0.237894 0.096134 2.475 0.013338 \*   
## GDLIN1 2.142459 0.121264 17.668 < 2e-16 \*\*\*  
## OBRAT -0.016400 0.005344 -3.069 0.002148 \*\*   
## BLACK1 -0.425865 0.126958 -3.354 0.000795 \*\*\*  
## HISPAN1 -0.463475 0.163507 -2.835 0.004588 \*\*   
## MALE1 -0.033267 0.117944 -0.282 0.777896   
## LOANPRC -0.840949 0.258988 -3.247 0.001166 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for binomial family taken to be 1)  
##   
## Null deviance: 1475.43 on 1968 degrees of freedom  
## Residual deviance: 958.84 on 1961 degrees of freedom  
## AIC: 974.84  
##   
## Number of Fisher Scoring iterations: 6

## Predict probabilities for prototypical individuals

prototype1$predictedprob <- predict (ProbitModel, newdata = prototype1, type ="response")  
prototype2$predictedprob <- predict (ProbitModel, newdata = prototype2, type ="response")  
  
prototype1

## MARRIED GDLIN OBRAT BLACK HISPAN MALE LOANPRC predictedprob  
## 1 0 1 32.39172 1 0 1 0.9 0.8318398

prototype2

## MARRIED GDLIN OBRAT BLACK HISPAN MALE LOANPRC predictedprob  
## 1 0 1 32.39172 1 0 0 0.9 0.8400658

LogitOverallModel$oddratia <- exp(coef(LogitOverallModel))  
variable.names(LogitOverallModel)

[1] “(Intercept)” “MARRIED1” “GDLIN1” “OBRAT” “BLACK1”  
[6] “HISPAN1” “MALE1” “LOANPRC”

logittable <- as.data.frame(cbind(variable.names(LogitOverallModel),  
 coef(LogitOverallModel),  
 exp(coef(LogitOverallModel))))  
names(logittable) <- c("Variables", "Coefficient", "Odd ratio")  
kable(logittable) %>% kable\_styling(full\_width = FALSE)

Variables

Coefficient

Odd ratio

(Intercept)

(Intercept)

1.38153116722637

3.9809925284988

MARRIED1

MARRIED1

0.475741856379615

1.60920755567216

GDLIN1

GDLIN1

3.71926898976392

41.2342404367958

OBRAT

OBRAT

-0.0340739216083136

0.966500056758137

BLACK1

BLACK1

-0.815693234720103

0.442332580747128

HISPAN1

HISPAN1

-0.900010237667604

0.406565497436871

MALE1

MALE1

-0.053947402379221

0.947481940487013

LOANPRC

LOANPRC

-1.68118592777998

0.186153080972447

summary(LogitOverallModel)

Call: glm(formula = APPROVE ~ ., family = “binomial”, data = mld)

Deviance Residuals: Min 1Q Median 3Q Max  
-2.8933 0.2445 0.3128 0.3742 2.3261

Coefficients: Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.38153 0.59166 2.335 0.019542 \*  
MARRIED1 0.47574 0.19201 2.478 0.013221 \*  
GDLIN1 3.71927 0.21717 17.126 < 2e-16  ***OBRAT -0.03407 0.01031 -3.305 0.000950***  BLACK1 -0.81569 0.24018 -3.396 0.000683  ***HISPAN1 -0.90001 0.31058 -2.898 0.003758***  *MALE1 -0.05395 0.23457 -0.230 0.818107*  
*LOANPRC -1.68119 0.50739 -3.313 0.000922* \*\* — Signif. codes: 0 ‘***’ 0.001 ’****’ 0.01 ’*’ 0.05 ‘.’ 0.1 ’ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 1475.4 on 1968 degrees of freedom Residual deviance: 959.4 on 1961 degrees of freedom AIC: 975.4

Number of Fisher Scoring iterations: 6

xtable(LogitOverallModel, type='html', html.table.attributes = "border=0")

% latex table generated in R 3.5.2 by xtable 1.8-3 package % Wed Mar 06 16:05:51 2019

# test create table for white black and hispanic logit model  
whitemodel = glm(APPROVE ~., data = mld\_white,   
 family = "binomial")  
wmodel\_tab<- as.data.frame(summary(whitemodel)$coefficients)  
wmodel\_tab$oddratio <- exp(coef(whitemodel))  
round(wmodel\_tab, 4)

Estimate Std. Error z value Pr(>|z|) oddratio

(Intercept) 1.4869 0.6897 2.1559 0.0311 4.4234 MARRIED1 0.6255 0.2205 2.8367 0.0046 1.8692 GDLIN1 3.7108 0.2555 14.5219 0.0000 40.8859 OBRAT -0.0262 0.0117 -2.2343 0.0255 0.9741 MALE1 -0.1029 0.2794 -0.3683 0.7126 0.9022 LOANPRC -2.1868 0.5978 -3.6579 0.0003 0.1123

#black model  
blackmodel = glm(APPROVE ~., data = mld\_black,   
 family = "binomial")  
  
bmodel\_tab<- as.data.frame(summary(blackmodel)$coefficients)  
bmodel\_tab$oddratio <- exp(coef(blackmodel))  
round(bmodel\_tab, 4)

Estimate Std. Error z value Pr(>|z|) oddratio

(Intercept) -1.3009 1.5803 -0.8232 0.4104 0.2723 MARRIED1 0.0080 0.5094 0.0157 0.9875 1.0080 GDLIN1 4.0398 0.5125 7.8827 0.0000 56.8172 OBRAT -0.0369 0.0295 -1.2522 0.2105 0.9638 MALE1 0.3319 0.5466 0.6072 0.5437 1.3936 LOANPRC 0.3557 1.3339 0.2666 0.7898 1.4271

#HIspan model  
hispanmodel = glm(APPROVE ~., data = mld\_hispan,   
 family = "binomial")  
  
hmodel\_tab<- as.data.frame(summary(hispanmodel)$coefficients)  
hmodel\_tab$oddratio <- exp(coef(hispanmodel))  
round(hmodel\_tab, 4)

Estimate Std. Error z value Pr(>|z|) oddratio

(Intercept) 5.2238 2.7182 1.9218 0.0546 185.6383 MARRIED1 -0.3767 0.7114 -0.5295 0.5965 0.6861 GDLIN1 3.1109 0.7649 4.0671 0.0000 22.4419 OBRAT -0.1041 0.0389 -2.6767 0.0074 0.9012 MALE1 -0.1506 0.8215 -0.1833 0.8546 0.8602 LOANPRC -2.8699 2.2576 -1.2712 0.2037 0.0567

resultablr <- cbind(wmodel\_tab[,c("Estimate","Std. Error", "oddratio")],  
 bmodel\_tab[,c("Estimate","Std. Error", "oddratio")],  
 hmodel\_tab[,c("Estimate","Std. Error", "oddratio")])  
  
round(resultablr,4) %>%  
 kable(format ="pandoc") %>%  
 kable\_styling(c("bordered"), position = "center", full\_width = FALSE) %>%  
 add\_header\_above(c(" ", "White" = 3, "Black" = 3, "Hispan" = 3))

## Warning in kable\_styling(., c("bordered"), position = "center", full\_width  
## = FALSE): Please specify format in kable. kableExtra can customize either  
## HTML or LaTeX outputs. See https://haozhu233.github.io/kableExtra/ for  
## details.

## Warning in add\_header\_above(., c(" ", White = 3, Black = 3, Hispan = 3)):  
## Please specify format in kable. kableExtra can customize either HTML or  
## LaTeX outputs. See https://haozhu233.github.io/kableExtra/ for details.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Es | timate St | d. Error od | dratio Es | timate St | d. Error od | dratio Es | timate St | d. Error od | dratio |
| (Intercept) | 1.4869 | 0.6897 | 4.4234 | -1.3009 | 1.5803 | 0.2723 | 5.2238 | 2.7182 | 185.6383 |
| MARRIED1 | 0.6255 | 0.2205 | 1.8692 | 0.0080 | 0.5094 | 1.0080 | -0.3767 | 0.7114 | 0.6861 |
| GDLIN1 | 3.7108 | 0.2555 | 40.8859 | 4.0398 | 0.5125 | 56.8172 | 3.1109 | 0.7649 | 22.4419 |
| OBRAT | -0.0262 | 0.0117 | 0.9741 | -0.0369 | 0.0295 | 0.9638 | -0.1041 | 0.0389 | 0.9012 |
| MALE1 | -0.1029 | 0.2794 | 0.9022 | 0.3319 | 0.5466 | 1.3936 | -0.1506 | 0.8215 | 0.8602 |
| LOANPRC | -2.1868 | 0.5978 | 0.1123 | 0.3557 | 1.3339 | 1.4271 | -2.8699 | 2.2576 | 0.0567 |