Stat 412

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0. Cleaning Up Data and Creating Data Groups

a) Remove NA Data

- Split out data with NA in any predictors
- split non-NA group to minority (default) vs majority (non-default) group
- Additional TODO: can check out characteristics of NA group so we can replace the NA values

```
# Read Credit Scoring Data Training Set
#cs_train <- cs_training
cs_train = read.csv("cs-training.csv")
train <- cs_train
raw_data <- cs_train    #150k rows

# Remove NA cases otherwise cannot predict
cs_train_omit <- na.omit(raw_data)  # 150k -> 120,269 obs
Predictor_Variables <- subset.data.frame(cs_train_omit, select = c(RevolvingUtilizationOfUnsecuredLines
))

summary(cs_train)
```

```
##        X          SeriousDlqin2yrs  RevolvingUtilizationOfUnsecuredLines
##  Min.   :     1   Min.   :0.00000   Min.   :    0.00
##  1st Qu.: 37501   1st Qu.:0.00000   1st Qu.:    0.03
```

```
##  Median : 75001   Median :0.00000   Median :    0.15
##  Mean   : 75001   Mean   :0.06684   Mean   :    6.05
##  3rd Qu.:112500   3rd Qu.:0.00000   3rd Qu.:    0.56
##  Max.   :150000   Max.   :1.00000   Max.   :50708.00
##
##       age        NumberOfTime30.59DaysPastDueNotWorse   DebtRatio
##  Min.   :  0.0   Min.   : 0.000                       Min.   :     0.0
##  1st Qu.: 41.0   1st Qu.: 0.000                       1st Qu.:     0.2
##  Median : 52.0   Median : 0.000                       Median :     0.4
##  Mean   : 52.3   Mean   : 0.421                       Mean   :   353.0
##  3rd Qu.: 63.0   3rd Qu.: 0.000                       3rd Qu.:     0.9
##  Max.   :109.0   Max.   :98.000                       Max.   :329664.0
##
##  MonthlyIncome     NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
##  Min.   :      0   Min.   : 0.000                  Min.   : 0.000
##  1st Qu.:   3400   1st Qu.: 5.000                  1st Qu.: 0.000
##  Median :   5400   Median : 8.000                  Median : 0.000
##  Mean   :   6670   Mean   : 8.453                  Mean   : 0.266
##  3rd Qu.:   8249   3rd Qu.:11.000                  3rd Qu.: 0.000
##  Max.   :3008750   Max.   :58.000                  Max.   :98.000
##  NA's   :29731
##  NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
##  Min.   : 0.000               Min.   : 0.0000
##  1st Qu.: 0.000               1st Qu.: 0.0000
##  Median : 1.000               Median : 0.0000
##  Mean   : 1.018               Mean   : 0.2404
##  3rd Qu.: 2.000               3rd Qu.: 0.0000
##  Max.   :54.000               Max.   :98.0000
##
##  NumberOfDependents
##  Min.   : 0.000
##  1st Qu.: 0.000
##  Median : 0.000
##  Mean   : 0.757
##  3rd Qu.: 1.000
##  Max.   :20.000
##  NA's   :3924
```

b) Split the data to Testing/Training & Minority, Majority Groups

```r
# Sample 60% of data for training Purpose
set.seed(1)
n = nrow(cs_train_omit)
na.idx = raw_data$X[-cs_train_omit$X]  # indexes of data with NA values that we removed
n.idx = sample(n, n*0.6) # Indexes for test train split

cs_train = cs_train_omit[n.idx,]  # Training data 72,161 obs
cs_test = cs_train_omit[-n.idx,]  # Testing data  48,108 obs.
cs_NA = raw_data[na.idx,]  # data with NA value  29,731 obs


## 1. Separate minority data vs majority data vs NA data total 72,161 obs
cs_train_min <- cs_train[cs_train$SeriousDlqin2yrs==1,]  # (omit) 10,026 -> (training) 5,009 obs
cs_train_maj <- cs_train[cs_train$SeriousDlqin2yrs==0,]  # (omit) 139,974 -> (training) 67,152 obs
```

```r
str(cs_train)
```

```
## 'data.frame':    72161 obs. of  12 variables:
##  $ X                                   : int  30484 74216 54077 86784 14388 31442 40844 145293 17360
##  $ SeriousDlqin2yrs                    : int  0 0 0 0 0 0 0 0 1 0 ...
##  $ RevolvingUtilizationOfUnsecuredLines: num  0.09474 0.05277 0.73665 0.02366 0.00582 ...
##  $ age                                 : int  47 68 36 36 44 40 59 65 50 49 ...
##  $ NumberOfTime30.59DaysPastDueNotWorse: int  0 0 0 0 0 1 0 0 0 0 ...
##  $ DebtRatio                           : num  0.3684 0.2276 0.0945 0.2171 0.1853 ...
##  $ MonthlyIncome                       : int  6250 11884 2000 5600 5100 2946 3950 10500 18381 10796
##  $ NumberOfOpenCreditLinesAndLoans     : int  8 13 6 9 24 17 7 23 10 7 ...
##  $ NumberOfTimes90DaysLate             : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ NumberRealEstateLoansOrLines        : int  1 2 0 1 1 3 0 2 1 2 ...
##  $ NumberOfTime60.89DaysPastDueNotWorse: int  0 0 0 0 0 0 0 0 1 0 ...
##  $ NumberOfDependents                  : int  3 1 1 0 2 0 0 0 1 0 ...
##  - attr(*, "na.action")= 'omit' Named int [1:29731] 7 9 17 33 42 53 59 63 72 87 ...
##   ..- attr(*, "names")= chr [1:29731] "7" "9" "17" "33" ...
```

```r
str(cs_train_min)
```

```
## 'data.frame':    4941 obs. of  12 variables:
##  $ X                                   : int  17360 90565 146254 102792 49072 142766 73164 75761 7788
##  $ SeriousDlqin2yrs                    : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ RevolvingUtilizationOfUnsecuredLines: num  0.667 0.942 1 1.026 0.659 ...
##  $ age                                 : int  50 59 28 30 43 37 46 47 37 42 ...
##  $ NumberOfTime30.59DaysPastDueNotWorse: int  0 1 98 1 0 0 0 0 98 0 ...
##  $ DebtRatio                           : num  0.103 0.1653 0 0.2348 0.0897 ...
##  $ MonthlyIncome                       : int  18381 8008 1664 2763 3900 16666 4200 11000 6000 6450 .
##  $ NumberOfOpenCreditLinesAndLoans     : int  10 6 0 9 4 22 7 14 0 12 ...
##  $ NumberOfTimes90DaysLate             : int  0 5 98 0 2 0 0 0 98 0 ...
##  $ NumberRealEstateLoansOrLines        : int  1 0 0 0 0 3 1 1 0 2 ...
##  $ NumberOfTime60.89DaysPastDueNotWorse: int  1 0 98 2 1 0 1 0 98 0 ...
##  $ NumberOfDependents                  : int  1 0 0 3 2 0 1 0 1 0 ...
##  - attr(*, "na.action")= 'omit' Named int [1:29731] 7 9 17 33 42 53 59 63 72 87 ...
##   ..- attr(*, "names")= chr [1:29731] "7" "9" "17" "33" ...
```

```r
str(cs_train_maj)
```

```
## 'data.frame':    67220 obs. of  12 variables:
##  $ X                                   : int  30484 74216 54077 86784 14388 31442 40844 145293 10260
##  $ SeriousDlqin2yrs                    : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ RevolvingUtilizationOfUnsecuredLines: num  0.09474 0.05277 0.73665 0.02366 0.00582 ...
##  $ age                                 : int  47 68 36 36 44 40 59 65 49 53 ...
##  $ NumberOfTime30.59DaysPastDueNotWorse: int  0 0 0 0 0 1 0 0 0 0 ...
##  $ DebtRatio                           : num  0.3684 0.2276 0.0945 0.2171 0.1853 ...
##  $ MonthlyIncome                       : int  6250 11884 2000 5600 5100 2946 3950 10500 10796 3741 .
##  $ NumberOfOpenCreditLinesAndLoans     : int  8 13 6 9 24 17 7 23 7 7 ...
##  $ NumberOfTimes90DaysLate             : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ NumberRealEstateLoansOrLines        : int  1 2 0 1 1 3 0 2 2 2 ...
##  $ NumberOfTime60.89DaysPastDueNotWorse: int  0 0 0 0 0 0 0 0 0 0 ...
##  $ NumberOfDependents                  : int  3 1 1 0 2 0 0 0 0 1 ...
##  - attr(*, "na.action")= 'omit' Named int [1:29731] 7 9 17 33 42 53 59 63 72 87 ...
##   ..- attr(*, "names")= chr [1:29731] "7" "9" "17" "33" ...
```

```r
# Split x and y variables
train.x = cs_train[,-which(names(cs_train) == "SeriousDlqin2yrs")]  # 72,161 obs of 10 var
train.x = cs_train[,-c(which(names(cs_train) == "SeriousDlqin2yrs"), which(names(cs_train) == "X"), whi
train.y = cs_train$SeriousDlqin2yrs
test.x = cs_test[,-which(names(cs_test) == "SeriousDlqin2yrs")]   # 48,108 obs
test.x = cs_test[,-c(which(names(cs_test) == "SeriousDlqin2yrs"), which(names(cs_test) == "X"))]
test.y = cs_test$SeriousDlqin2yrs
```

```r
hist(cs_train[,2]) #Response Variable
```

```r
hist(cs_train[,3]) #RevolvingUtilizationOfUnsecuredLines
```

```
hist(cs_train[,4]) #age
```

```
hist(cs_train[,5]) #NumberOfTime30.59DaysPastDueNotWorse
```

```
hist(cs_train[,6]) #DebtRatio
```

```
hist(cs_train[,7]) #MonthlyIncome
```

```
hist(cs_train[,8]) #NumberOfOpenCreditLinesAndLoans
```

```
hist(cs_train[,9]) #NumberOfTimes90DaysLate
```

```
hist(cs_train[,10])#NumberRealEstateLoansOrLines
```

```
hist(cs_train[,11])#NumberOfTime60.89DaysPastDueNotWorse
```

```
hist(cs_train[,12])#NumberOfDependents`   ``
```

Creating Indicator Variables for Extreme Data

```
Jimmys_Bad_Variables <- cs_train
Jimmys_Bad_Variables$HighRevolving <- 0
Jimmys_Bad_Variables$HighRevolving[quantile(Jimmys_Bad_Variables[,3],0.95)] <- 1

Jimmys_Bad_Variables$Many_LessThan2MonthsLate <- 0
Jimmys_Bad_Variables$Many_LessThan2MonthsLate[quantile(Jimmys_Bad_Variables[,5],0.95)] <- 1

Jimmys_Bad_Variables$HighDebtRatio <- 0
Jimmys_Bad_Variables$HighDebtRatio[quantile(Jimmys_Bad_Variables[,6],0.95)] <- 1

Jimmys_Bad_Variables$Rich <- 0
Jimmys_Bad_Variables$Rich[quantile(Jimmys_Bad_Variables[,6],0.95)] <- 1

Jimmys_Bad_Variables$Many_CurrentLoans <- 0
Jimmys_Bad_Variables$Many_CurrentLoans[quantile(Jimmys_Bad_Variables[,8],0.95)] <- 1

Jimmys_Bad_Variables$Many_AtLeastThreeMonthsLate <- 0
Jimmys_Bad_Variables$Many_AtLeastThreeMonthsLate[quantile(Jimmys_Bad_Variables[,9],0.95)] <- 1

Jimmys_Bad_Variables$Many_HouseLoans <- 0
Jimmys_Bad_Variables$Many_HouseLoans[quantile(Jimmys_Bad_Variables[,10],0.95)] <- 1

Jimmys_Bad_Variables$Many_TwoToThreeMonthsLate <- 0
```

```r
Jimmys_Bad_Variables$Many_TwoToThreeMonthsLate[quantile(Jimmys_Bad_Variables[,11],0.95)] <- 1

Jimmys_Bad_Variables$NA_Dependents_are_Mean <- Jimmys_Bad_Variables[,12] #Need to Change NA values to M
Jimmys_Bad_Variables$NA_Dependents_are_Mean[is.na(Jimmys_Bad_Variables[,12])] <- mean(Jimmys_Bad_Variabl
Jimmys_Bad_Variables$Many_Dependents <- 0
Jimmys_Bad_Variables$Many_Dependents[quantile(Jimmys_Bad_Variables$NA_Dependents_are_Mean,0.95)] <- 1

train1 <-Jimmys_Bad_Variables[Jimmys_Bad_Variables[,3]< quantile(Jimmys_Bad_Variables[,3],0.95),]
```

```r
head(Jimmys_Bad_Variables)
```

```
##           X SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 30484 30484                0                           0.09474044  47
## 74216 74216                0                           0.05277307  68
## 54077 54077                0                           0.73665267  36
## 86784 86784                0                           0.02365700  36
## 14388 14388                0                           0.00581900  44
## 31442 31442                0                           0.11523783  40
##       NumberOfTime30.59DaysPastDueNotWorse  DebtRatio MonthlyIncome
## 30484                                    0 0.36842105          6250
## 74216                                    0 0.22759781         11884
## 54077                                    0 0.09445277          2000
## 86784                                    0 0.21710409          5600
## 14388                                    0 0.18525779          5100
## 31442                                    1 2.49168646          2946
##       NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 30484                               8                       0
## 74216                              13                       0
## 54077                               6                       0
## 86784                               9                       0
## 14388                              24                       0
## 31442                              17                       0
##       NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 30484                            1                                    0
## 74216                            2                                    0
## 54077                            0                                    0
## 86784                            1                                    0
## 14388                            1                                    0
## 31442                            3                                    0
##       NumberOfDependents HighRevolving Many_LessThan2MonthsLate HighDebtRatio
## 30484                  3             0                        0             1
## 74216                  1             0                        1             0
## 54077                  1             0                        0             0
## 86784                  0             0                        0             0
## 14388                  2             0                        0             0
## 31442                  0             0                        0             0
##       Rich Many_CurrentLoans Many_AtLeastThreeMonthsLate Many_HouseLoans
## 30484    1                 0                           1               0
## 74216    0                 0                           0               0
## 54077    0                 0                           0               1
## 86784    0                 0                           0               0
## 14388    0                 0                           0               0
## 31442    0                 0                           0               0
##       Many_TwoToThreeMonthsLate NA_Dependents_are_Mean Many_Dependents
```

```
## 30484                          1                      3               0
## 74216                          0                      1               0
## 54077                          0                      1               1
## 86784                          0                      0               0
## 14388                          0                      2               0
## 31442                          0                      0               0
```

```
Just_Bad_Variables <- subset.data.frame(Jimmys_Bad_Variables, select = c(X,SeriousDlqin2yrs, age, HighR
```

1. Question/Goal

- Comparing our model performance against paper's model
- Most important factors

2. EDA (Still need to Clean up for better graphs)

- monthly income = 0
- 30k monthly income = NA
- Dependent = NA 4k
- age 0 remove - only 1 point
- age very old
- group by age group etc
- 13 - 101 or older (maybe cut at 100)
- 80 or more

```
#plot(SeriousDlqin2yrs ~ age, data = cs_train_maj)
cs_train_maj_g1 <- cs_train_maj[cs_train_maj$MonthlyIncome<500000,] # less than 500k monthly income
cs_train_maj_g1 <- cs_train_maj[cs_train_maj$MonthlyIncome<20000,] # less than 20k monthly income
plot(MonthlyIncome ~ age, data = cs_train_maj_g1)
```

```
train <- cs_train
##Shelly EDA Code
tapply(cs_train$RevolvingUtilizationOfUnsecuredLines, train$SeriousDlqin2yrs, median) #use this; data v
```

```
##         0         1
## 0.1544904 0.8066074
```

```
##Next Steps
# ***need final data set which excludes outliers for which we will create final model from
# do box plots for age group and income; fix axes so that box is readable -Shelly
# histogram of groupings like income by age groups, different colors -Yolanda
# sampling of data --> randomly select instead of adding additional data for response variable -Shelly
# ClassDiscovery package and DataExplorer --> provide initial graphs and analyses of data; also initial



 #Remove outliers; maybe only keep anything greater than 10
 tapply(train$RevolvingUtilizationOfUnsecuredLines, train$SeriousDlqin2yrs, mean) #d
```

```
##        0        1
## 6.566204 3.184407
```

```
 tapply(train$age, train$SeriousDlqin2yrs, median) #median age of 45 for people defaulting
```

```
##  0  1
## 51 46
```

```r
#tapply(train$`NumberOfTime30-59DaysPastDueNotWorse`, train$SeriousDlqin2yrs, mean) #2.4 times for tho
tapply(train$NumberOfTimes90DaysLate, train$SeriousDlqin2yrs, mean) #2.1 times for those with delinque
```

```
##        0        1
## 0.111931 1.523173
```

```r
tapply(train$DebtRatio, train$SeriousDlqin2yrs, median) #0.43 for delinquency incidence vs 0.36 for no
```

```
##         0         1
## 0.2924788 0.3600771
```

```r
#tapply(train$NumIncome, train$SeriousDlqin2yrs, median) #delinquency monthly income of $3.8K vs $4.4K
tapply(train$NumberOfTimes90DaysLate, train$SeriousDlqin2yrs, mean)
```

```
##        0        1
## 0.111931 1.523173
```

```r
#summary(train$NumIncome)
```

3. Balancing Data (Creating New Datasets)

- Use clustering and pick one sub-group from majority
  - can try Age/Income
  - try Income/debt ratio
- Use bagging algorithm to create more minority data
- Use NA indicator 0 or 1 (maybe use mean/median)

b) Resampling Majority Data (new_train.final 1 & 2)

- Method 1: use Full omit Data to sample majority data (new_train.final1) (8357*2)
- Method 2: use Training Data to sample majority data (new_train.final2) (4941*2)

```r
###SHELLY -  Balance Response Variable
set.seed(2) # for reproducibility


## Method 1: Balance Full omit Data (new_train.final1)
new_train <- filter(cs_train_omit, cs_train_omit$SeriousDlqin2yrs == 0) #112k rows

#Check Response Variable Balance in cs_train_omit data
table(cs_train_omit$SeriousDlqin2yrs) #8,357 1's
```

```
##
##      0      1
## 111912   8357
```

```r
n_add <- sum(cs_train_omit$SeriousDlqin2yrs ==1)  # Number of Default
n_add
```

```
## [1] 8357
```

```r
new_train2 <- new_train[sample(1:nrow(new_train)),] #112k rows without replacement
new_train3 <- new_train2[1:n_add,]

########**Merge Data Together (use new_train5 variable)
new_train4 <- filter(cs_train_omit, cs_train_omit$SeriousDlqin2yrs == 1)
```

```r
#nrow(new_train4)
new_train.final1 <- rbind(new_train3, new_train4)
nrow(new_train.final1) #16,714 rows as there should be (8357*2)
```

```
## [1] 16714
```

```r
table(new_train.final1$SeriousDlqin2yrs) #correct; equal # of 0's and 1's
```

```
##
##    0    1
## 8357 8357
```

```r
## Method 2: Balance Training Data (new_train.final2)

  #Check Response Variable Balance in cs_train_omit data
  table(cs_train$SeriousDlqin2yrs) #0: 67220  1: 4941
```

```
##
##     0     1
## 67220  4941
```

```r
  n_add <- nrow(cs_train_min) # Number of Default

 # Randomly Sample data from Non-Default group (sample = min group obs#)
 new_train <- cs_train_maj[sample(1:nrow(cs_train_maj),n_add, replace=FALSE),] #67220 rows without repl

 ########**Merge Data Together (use new_train.final2 variable)
 new_train.final2 <- rbind(new_train, cs_train_min)
 nrow(new_train.final2) #10k rows as there should be (4941*2)
```

```
## [1] 9882
```

```r
table(new_train.final2$SeriousDlqin2yrs) #correct; equal # of 0's and 1's
```

```
##
##    0    1
## 4941 4941
```

c) Using Clustering to select from Majority Group

Select one cluster from majority group and combine with minority group data to form new Balanced Training Data

```r
training_dataset <- data.frame(train.x, train.y)
kmeans_model_train  <- kmeans(training_dataset, centers = 5) # centers because paper had 5 clusters
kmeans_model_train$centers #what each cluster's average values are for each variable. The most obvious
```

```
##   RevolvingUtilizationOfUnsecuredLines      age
## 1                           0.25563963 51.85714
## 2                           0.30094326 53.69880
## 3                           0.00732813 52.00000
## 4                          14.17070502 53.63628
## 5                           4.13445042 50.60142
##   NumberOfTime30.59DaysPastDueNotWorse    DebtRatio MonthlyIncome
## 1                            0.2857143  0.003406329    580671.714
## 2                            0.2228916  0.076526033     91885.494
## 3                            0.0000000  0.001470045   3008750.000
## 4                            0.2515422  0.296182799     12837.435
```

```
## 5                            0.4164810 35.479464445      4525.353
##   NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 1                        9.142857              0.00000000
## 2                       11.415663              0.06626506
## 3                       10.000000              0.00000000
## 4                       10.787612              0.05615007
## 5                        8.178820              0.25217019
##   NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 1                    1.0000000                           0.28571429
## 2                    2.1927711                           0.01807229
## 3                    1.0000000                           0.00000000
## 4                    1.6671912                           0.05470225
## 5                    0.8784692                           0.22136860
##   NumberOfDependents    train.y
## 1          1.2857143 0.00000000
## 2          1.1566265 0.06024096
## 3          3.0000000 0.00000000
## 4          1.1644215 0.04418985
## 5          0.7642823 0.07538190
```

```
#Cluster 3 and 4 are different than Cluster 1 and 2 in terms of the Response Variable.
kmeans_model_train$size
```

```
## [1]     7   166     1 15886 56101
```

##Sample from Majority Data Proportional to Minority Data

```
set.seed(500)
Majority <- cs_train_maj[,-which(names(cs_train_maj) == "X")]
kmeans_model_train_majority <- kmeans(Majority, centers = 5)
kmeans_model_train_majority$centers
```

```
##   SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines      age
## 1                0                           0.25563963 51.85714
## 2                0                           0.29232591 54.07692
## 3                0                           4.17487638 51.02706
## 4                0                           0.00732813 52.00000
## 5                0                          14.81383169 53.81218
##   NumberOfTime30.59DaysPastDueNotWorse    DebtRatio MonthlyIncome
## 1                            0.2857143  0.003406329    580671.714
## 2                            0.1923077  0.075301645     92001.218
## 3                            0.2853509 35.684460036      4552.355
## 4                            0.0000000  0.001470045   3008750.000
## 5                            0.2149120  0.289472207     12835.539
##   NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 1                        9.142857              0.00000000
## 2                       11.429487              0.04487179
## 3                        8.217530              0.13319329
## 4                       10.000000              0.00000000
## 5                       10.728789              0.03994990
##   NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 1                    1.0000000                           0.28571429
## 2                    2.0641026                           0.01282051
## 3                    0.8795845                           0.12134061
## 4                    1.0000000                           0.00000000
## 5                    1.6433516                           0.04146615
```

```
##   NumberOfDependents
## 1          1.2857143
## 2          1.1666667
## 3          0.7441363
## 4          3.0000000
## 5          1.1581515
```

```
kmeans_model_train_majority$size
```

```
## [1]     7   156 51887     1 15169
```

```
cluster_majority <-kmeans_model_train_majority$cluster
Majority_with_cluster <- cbind(Majority, cluster = kmeans_model_train_majority$cluster)
head(Majority_with_cluster)
```

```
##       SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 30484                0                           0.09474044  47
## 74216                0                           0.05277307  68
## 54077                0                           0.73665267  36
## 86784                0                           0.02365700  36
## 14388                0                           0.00581900  44
## 31442                0                           0.11523783  40
##       NumberOfTime30.59DaysPastDueNotWorse  DebtRatio MonthlyIncome
## 30484                                    0 0.36842105          6250
## 74216                                    0 0.22759781         11884
## 54077                                    0 0.09445277          2000
## 86784                                    0 0.21710409          5600
## 14388                                    0 0.18525779          5100
## 31442                                    1 2.49168646          2946
##       NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 30484                               8                       0
## 74216                              13                       0
## 54077                               6                       0
## 86784                               9                       0
## 14388                              24                       0
## 31442                              17                       0
##       NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 30484                            1                                    0
## 74216                            2                                    0
## 54077                            0                                    0
## 86784                            1                                    0
## 14388                            1                                    0
## 31442                            3                                    0
##       NumberOfDependents cluster
## 30484                  3       3
## 74216                  1       5
## 54077                  1       3
## 86784                  0       3
## 14388                  2       3
## 31442                  0       3
```

```
Cluster1 <- subset.data.frame(Majority_with_cluster,cluster == 1)
Cluster2 <- subset.data.frame(Majority_with_cluster,cluster == 2)
Cluster3 <- subset.data.frame(Majority_with_cluster,cluster == 3)
Cluster4 <- subset.data.frame(Majority_with_cluster,cluster == 4)
Cluster5 <- subset.data.frame(Majority_with_cluster, cluster == 5)
```

```r
Special_Small_Clusters <- sum(nrow(Cluster1),nrow(Cluster2),nrow(Cluster4))
Sample3 <- Cluster3[sample(nrow(Cluster3), nrow(Cluster3)/(nrow(Majority) - Special_Small_Clusters) * n
Sample3
```

```
##        SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 35580                 0                          2.028185e-01  46
## 46953                 0                          1.629959e-02  64
## 52453                 0                          0.000000e+00  47
## 24027                 0                          2.444725e-02  81
## 1521                  0                          3.518928e-01  45
## 61774                 0                          2.084403e-02  52
## 57130                 0                          1.831676e-01  35
## 80283                 0                          9.999999e-01  26
## 145496                0                          9.999999e-01  52
## 46162                 0                          1.820346e-01  35
## 19398                 0                          4.117932e-01  30
## 88300                 0                          2.862652e-01  68
## 7429                  0                          1.048280e+00  57
## 42092                 0                          9.999999e-01  28
## 105437                0                          2.953215e-02  81
## 15786                 0                          9.980040e-01  58
## 146690                0                          1.411925e-01  63
## 140730                0                          3.038997e-01  42
## 46821                 0                          0.000000e+00  85
## 58102                 0                          6.310580e-04  53
## 137929                0                          3.353829e-01  61
## 64582                 0                          7.692308e-02  24
## 42318                 0                          9.999999e-01  39
## 52970                 0                          3.229534e-02  77
## 12848                 0                          7.082065e-02  30
## 47977                 0                          1.448199e-01  41
## 76624                 0                          4.185454e-01  56
## 68296                 0                          4.902735e-02  34
## 59573                 0                          3.606898e-01  39
## 25961                 0                          1.546589e-01  57
## 67477                 0                          1.242658e-02  33
## 120588                0                          6.571241e-03  43
## 14289                 0                          4.232577e-01  51
## 131394                0                          8.107800e-04  67
## 108140                0                          0.000000e+00  38
## 45005                 0                          0.000000e+00  54
## 21012                 0                          1.042303e-02  61
## 149334                0                          3.897485e-01  63
## 48644                 0                          2.826192e-01  34
## 18405                 0                          0.000000e+00  78
## 62018                 0                          1.962810e-01  57
## 134377                0                          7.993410e-01  47
## 59971                 0                          9.999999e-01  28
## 16834                 0                          6.178209e-02  33
## 24349                 0                          4.589289e-01  81
## 65634                 0                          8.130272e-02  65
## 132439                0                          4.478831e-03  65
## 129102                0                          9.650087e-01  45
## 84842                 0                          5.415549e-03  81
```

```
## 25367                0                        8.749450e-04  40
## 69526                0                        3.107442e-02  80
## 127629               0                        1.501733e-03  72
## 130867               0                        1.745201e-03  47
## 53803                0                        7.357758e-01  39
## 140520               0                        7.208099e-02  53
## 8598                 0                        2.211913e-01  58
## 22097                0                        6.798058e-01  57
## 41262                0                        8.294433e-02  52
## 128569               0                        0.000000e+00  49
## 65612                0                        4.075459e-03  26
## 12510                0                        4.374605e-01  45
## 59602                0                        1.800910e-01  37
## 123838               0                        9.999999e-01  32
## 91758                0                        8.022053e-02  68
## 43316                0                        6.659667e-02  53
## 46064                0                        7.776889e-01  25
## 103290               0                        0.000000e+00  24
## 106964               0                        1.255794e-01  38
## 64264                0                        7.231045e-01  38
## 136198               0                        3.290789e-01  53
## 104056               0                        1.384517e-01  41
## 82370                0                        1.056629e+00  50
## 100651               0                        1.898650e-02  83
## 100839               0                        1.190960e-02  76
## 22793                0                        8.661269e-01  29
## 146335               0                        1.197612e-01  70
## 58469                0                        0.000000e+00  29
## 63622                0                        3.245422e-01  51
## 50792                0                        3.577590e-01  39
## 20230                0                        4.339980e-01  29
## 35691                0                        1.355809e-01  53
## 145813               0                        9.999999e-01  37
## 60388                0                        0.000000e+00  38
## 38157                0                        2.298975e-01  41
## 83580                0                        0.000000e+00  64
## 81508                0                        6.702927e-02  31
## 14108                0                        0.000000e+00  59
## 86628                0                        2.735373e-01  85
## 60348                0                        2.371170e-01  37
## 13906                0                        2.426784e-01  44
## 30467                0                        6.624030e-02  64
## 135337               0                        2.162585e-02  37
## 90586                0                        8.019447e-01  57
## 15862                0                        9.815373e-03  65
## 145689               0                        3.802137e-01  62
## 69899                0                        9.692762e-01  44
## 110190               0                        1.459830e-02  53
## 101006               0                        0.000000e+00  43
## 117549               0                        9.999999e-01  34
## 25395                0                        2.591751e-01  41
## 13715                0                        4.041845e-01  39
## 63920                0                        1.770923e-02  23
## 35383                0                        4.948039e-02  61
```

```
## 39419          0                    4.124344e-01  38
## 104925         0                    0.000000e+00  42
## 2005           0                    2.827115e-01  63
## 91013          0                    5.729514e-02  26
## 106956         0                    7.805292e-03  35
## 116549         0                    5.419127e-02  54
## 136746         0                    0.000000e+00  41
## 96796          0                    8.291034e-03  67
## 30629          0                    1.371190e-01  62
## 73382          0                    4.410075e-03  54
## 90238          0                    9.176800e-02  31
## 125086         0                    4.677695e-02  49
## 1277           0                    9.999999e-01  29
## 26226          0                    3.311580e-01  37
## 20789          0                    5.640739e-02  64
## 6967           0                    8.850169e-01  35
## 3139           0                    1.057977e-01  29
## 136776         0                    3.058022e-02  54
## 77752          0                    8.294239e-02  45
## 95117          0                    0.000000e+00  52
## 3710           0                    5.653629e-03  59
## 83449          0                    9.442621e-01  27
## 97425          0                    9.057476e-02  55
## 148776         0                    9.999999e-01  32
## 99915          0                    6.527623e-01  40
## 36781          0                    7.293903e-03  44
## 10537          0                    5.328578e-01  42
## 67045          0                    4.375624e-01  24
## 71089          0                    9.999999e-01  28
## 54096          0                    2.598981e-01  56
## 99962          0                    0.000000e+00  51
## 61211          0                    2.378387e-02  58
## 30218          0                    3.142558e-03  41
## 52036          0                    0.000000e+00  23
## 10089          0                    3.585401e-01  66
## 39129          0                    9.999999e-01  40
## 11238          0                    1.412171e-01  43
## 140972         0                    4.220905e-02  61
## 146581         0                    9.561155e-01  51
## 128262         0                    8.647336e-01  58
## 149596         0                    2.489917e-02  50
## 5168           0                    3.828412e-01  52
## 142800         0                    3.997652e-01  36
## 109385         0                    1.588962e-02  54
## 11779          0                    3.332869e-02  71
## 4169           0                    5.127568e-01  32
## 87546          0                    6.128978e-01  47
## 105612         0                    3.295960e-01  38
## 40172          0                    7.883598e-01  30
## 97179          0                    9.063482e-02  55
## 72936          0                    1.352331e-01  61
## 140856         0                    4.913984e-01  52
## 95437          0                    9.999999e-01  42
## 59486          0                    9.971879e-01  47
```

```
## 90546                0                          5.005190e-01  64
## 41040                0                          4.305827e-01  29
## 102471               0                          9.999999e-01  40
## 68699                0                          8.607380e-04  51
## 99513                0                          7.852307e-01  43
## 124044               0                          7.637347e-01  54
## 31164                0                          1.365810e-04  41
## 53572                0                          3.251479e-02  68
## 127885               0                          8.627115e-02  37
## 124506               0                          5.111798e-01  43
## 79691                0                          2.961629e-02  30
## 81492                0                          3.162943e-02  53
## 103067               0                          4.859757e-02  53
## 42238                0                          6.131755e-02  30
## 64952                0                          1.068550e-01  49
## 44757                0                          7.128960e-04  58
## 104418               0                          2.491155e-02  61
## 81694                0                          3.021375e-02  49
## 79257                0                          3.107069e-02  35
## 82074                0                          3.654949e-01  27
## 49638                0                          0.000000e+00  65
## 80741                0                          8.979393e-01  48
## 115809               0                          9.999999e-01  50
## 96165                0                          7.039414e-02  60
## 17253                0                          1.871813e-01  65
## 108834               0                          3.617872e-01  47
## 85185                0                          1.172692e-01  78
## 3310                 0                          1.205824e-01  89
## 74657                0                          4.680040e-01  30
## 31402                0                          7.848044e-01  67
## 4124                 0                          3.412694e-02  66
## 24356                0                          2.881318e-01  68
## 122869               0                          8.804491e-01  81
## 31798                0                          2.362205e-01  55
## 19618                0                          7.467655e-01  56
## 92874                0                          2.044738e-01  60
## 69078                0                          2.033796e-01  33
## 64331                0                          1.428817e-01  63
## 18632                0                          4.438715e-01  53
## 120866               0                          1.332068e-02  35
## 29466                0                          1.958668e-01  29
## 58537                0                          1.669967e-01  47
## 6639                 0                          8.456687e-01  31
## 82040                0                          8.738711e-02  60
## 91052                0                          9.999999e-01  46
## 13759                0                          4.617297e-01  52
## 72625                0                          0.000000e+00  37
## 73541                0                          2.154839e-01  72
## 104924               0                          3.717398e-01  58
## 63784                0                          7.899635e-01  37
## 106701               0                          2.970041e-01  45
## 140150               0                          2.800654e-01  30
## 18796                0                          0.000000e+00  52
## 41852                0                          0.000000e+00  46
```

```
## 85465                0                          9.999999e-01  72
## 51519                0                          4.415732e-03  54
## 2879                 0                          4.935065e-01  24
## 98506                0                          6.890700e-02  29
## 33754                0                          4.378531e-01  74
## 61219                0                          3.608754e-02  47
## 126327               0                          1.016225e-01  66
## 17503                0                          8.438931e-02  66
## 70778                0                          8.866602e-02  40
## 109741               0                          2.003092e-01  50
## 143027               0                          6.916514e-01  57
## 12497                0                          0.000000e+00  47
## 87836                0                          1.201197e-02  63
## 61532                0                          6.273686e-01  62
## 4278                 0                          8.368008e-01  57
## 117571               0                          0.000000e+00  72
## 98762                0                          5.760245e-02  61
## 131682               0                          6.189887e-03  29
## 126181               0                          9.999999e-01  31
## 10778                0                          4.257978e-01  28
## 143293               0                          1.589460e-01  41
## 4666                 0                          2.286025e-01  53
## 6631                 0                          3.141735e-01  63
## 20940                0                          1.362214e-01  37
## 57355                0                          2.934427e-01  44
## 8380                 0                          1.013613e-02  57
## 34667                0                          2.732969e-02  35
## 63550                0                          1.597249e-01  71
## 25058                0                          0.000000e+00  32
## 35869                0                          2.325626e-01  38
## 53291                0                          9.999999e-01  74
## 106189               0                          1.982121e-01  40
## 104325               0                          9.981330e-01  35
## 63167                0                          0.000000e+00  41
## 64112                0                          3.047107e-01  65
## 145282               0                          3.671582e-01  35
## 144139               0                          9.999999e-01  36
## 52631                0                          3.235486e-01  45
## 131645               0                          1.585397e-01  43
## 75053                0                          1.023273e-01  74
## 21321                0                          4.854537e-01  54
## 74091                0                          6.182342e-01  61
## 110825               0                          9.224507e-01  67
## 33270                0                          4.576123e-02  40
## 62172                0                          4.930276e-01  43
## 149500               0                          0.000000e+00  63
## 47860                0                          2.734906e-01  39
## 32217                0                          1.641918e-01  65
## 4594                 0                          2.384022e-03  61
## 97023                0                          2.646163e-01  46
## 45501                0                          3.487469e-02  49
## 19970                0                          8.744446e-02  37
## 145012               0                          6.918616e-02  50
## 46570                0                          1.281047e-02  59
```

```
## 57788                0                          7.357896e-01  65
## 61960                0                          2.719456e-02  31
## 4370                 0                          1.540256e-01  49
## 65064                0                          1.512406e-02  56
## 22525                0                          2.736747e-01  45
## 16184                0                          9.999999e-01  61
## 20937                0                          4.666045e-03  62
## 122894               0                          0.000000e+00  47
## 9809                 0                          2.605393e-02  67
## 121191               0                          4.995715e-01  30
## 64812                0                          3.935145e-02  79
## 91455                0                          3.275524e-02  79
## 40971                0                          9.998337e-01  28
## 116730               0                          3.110506e-02  72
## 50615                0                          0.000000e+00  54
## 114321               0                          7.353162e-01  51
## 27566                0                          2.570375e-01  43
## 109724               0                          9.479526e-02  52
## 5152                 0                          1.219976e-02  78
## 27654                0                          7.171315e-01  33
## 116889               0                          9.999390e-01  60
## 134404               0                          0.000000e+00  33
## 4339                 0                          3.828579e-01  46
## 101093               0                          5.624235e-02  33
## 54408                0                          4.438273e-01  50
## 11299                0                          1.013998e-01  60
## 129191               0                          1.254738e-01  52
## 143777               0                          1.993273e-01  44
## 92858                0                          1.519856e-01  54
## 77353                0                          1.056859e-02  45
## 74228                0                          3.720065e-03  66
## 98536                0                          6.237501e-02  84
## 104905               0                          3.436630e-01  44
## 138162               0                          9.999999e-01  42
## 68447                0                          3.677796e-03  58
## 51945                0                          1.178282e-01  30
## 45921                0                          2.720712e-01  33
## 23368                0                          1.007798e+00  43
## 138970               0                          5.399280e-02  56
## 92313                0                          2.456008e-02  55
## 112928               0                          1.379934e-01  39
## 84234                0                          9.999999e-01  39
## 120859               0                          4.184964e-01  74
## 93196                0                          2.153795e-01  94
## 117555               0                          8.016219e-02  44
## 66177                0                          5.891626e-02  57
## 84130                0                          5.044665e-01  64
## 100068               0                          7.080286e-03  46
## 104257               0                          4.008666e-01  38
## 134829               0                          9.999999e-01  33
## 28669                0                          1.941952e-02  77
## 148998               0                          2.437426e-02  68
## 135065               0                          2.423618e-03  32
## 89160                0                          9.999999e-01  36
```

```
## 8657                    0                          8.328908e-03  76
## 72090                   0                          6.546671e-01  45
## 106658                  0                          8.931386e-03  72
## 44760                   0                          2.391556e-02  84
## 60424                   0                          5.850709e-01  50
## 11244                   0                          1.833055e-03  51
## 95715                   0                          5.189450e-03  67
## 76958                   0                          3.500385e-01  70
## 51967                   0                          1.666558e-02  88
## 104563                  0                          2.160921e-02  64
## 78279                   0                          2.545680e-01  58
## 78598                   0                          2.644620e-01  45
## 69283                   0                          1.669987e-02  44
## 74049                   0                          7.316280e-02  63
## 39838                   0                          5.099494e-01  49
## 97071                   0                          5.807849e-02  30
## 83305                   0                          1.718136e-01  53
## 144977                  0                          4.482112e-01  45
## 92989                   0                          1.824860e-01  53
## 99481                   0                          9.999999e-01  46
## 74800                   0                          9.999999e-01  33
## 134488                  0                          5.219245e-02  56
## 126335                  0                          9.911009e-01  39
## 136017                  0                          0.000000e+00  32
## 20434                   0                          1.306774e-01  44
## 10264                   0                          3.291781e-01  44
## 59691                   0                          9.999999e-01  39
## 63767                   0                          2.534918e-02  51
## 113541                  0                          1.420970e-02  57
## 125563                  0                          7.613742e-01  57
## 106855                  0                          9.903975e-01  56
## 24259                   0                          1.156184e-01  59
## 90767                   0                          1.231097e-01  51
## 36206                   0                          2.157551e-02  45
## 90933                   0                          9.152102e-02  63
## 104320                  0                          1.205221e-01  60
## 25479                   0                          7.213291e-01  38
## 87144                   0                          9.999999e-01  58
## 38378                   0                          1.844727e-01  56
## 10395                   0                          1.171077e-01  63
## 64287                   0                          5.188914e-03  68
## 136625                  0                          1.133704e-01  53
## 79983                   0                          4.799620e-04  33
## 108015                  0                          9.999999e-01  40
## 71640                   0                          6.379681e-02  48
## 85674                   0                          5.944056e-01  25
## 94329                   0                          9.999999e-01  79
## 35001                   0                          3.085597e-02  65
## 121349                  0                          2.522880e-02  44
## 9455                    0                          1.102807e+00  52
## 13528                   0                          3.824588e-01  55
## 104103                  0                          0.000000e+00  62
## 104410                  0                          6.800648e-02  45
## 50632                   0                          9.653035e-01  40
```

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## 74861                0                        9.999999e-01  27
## 127017               0                        1.244338e-01  36
## 146988               0                        7.870266e-01  45
## 124162               0                        5.218687e-01  54
## 133253               0                        4.279860e-01  67
## 65645                0                        6.957440e-02  41
## 45709                0                        4.082025e-02  58
## 124132               0                        2.907061e-01  39
## 117188               0                        0.000000e+00  51
## 39089                0                        3.589478e-01  29
## 21045                0                        1.369083e-01  38
## 11665                0                        3.832056e-01  41
## 9929                 0                        5.275750e-02  47
## 52571                0                        3.849726e-01  49
## 109562               0                        4.959901e-03  84
## 99686                0                        8.842481e-01  47
## 111235               0                        4.215087e-01  27
## 28706                0                        4.209579e-02  36
## 11510                0                        4.652703e-01  43
## 96222                0                        2.108642e-01  49
## 62050                0                        1.071937e-01  78
## 137883               0                        4.798993e-01  41
## 72999                0                        5.926735e-01  44
## 22617                0                        3.139022e-01  60
## 7341                 0                        5.392631e-01  57
## 7545                 0                        2.709148e-02  72
## 12991                0                        0.000000e+00  42
## 27629                0                        8.968332e-02  39
## 112822               0                        5.465541e-01  67
## 25925                0                        3.572217e-01  38
## 47502                0                        9.999999e-01  65
## 131130               0                        3.090744e-01  35
## 134894               0                        9.999999e-01  55
## 35937                0                        9.999999e-01  75
## 27545                0                        2.787957e-01  64
## 119348               0                        2.254145e-01  67
## 131072               0                        1.820130e-01  62
## 59435                0                        2.510180e-02  62
## 9470                 0                        5.380574e-02  33
## 110850               0                        4.638918e-01  50
## 68109                0                        4.501571e-01  79
## 33711                0                        3.455614e-01  37
## 99795                0                        0.000000e+00  36
## 60474                0                        1.099267e+00  54
## 21909                0                        3.301155e-01  70
## 10283                0                        6.108452e-01  50
## 98503                0                        4.284751e-01  52
## 106397               0                        2.820811e-02  62
## 62023                0                        0.000000e+00  44
## 148160               0                        8.163237e-01  73
## 73624                0                        2.022449e-02  35
## 21508                0                        9.568792e-02  47
## 88829                0                        1.461194e-01  56
## 29128                0                        2.179564e-01  26
```

```
## 47462                0                        1.608958e-02  53
## 2649                 0                        0.000000e+00  57
## 5110                 0                        3.721716e-03  49
## 12160                0                        2.949645e-01  33
## 80987                0                        0.000000e+00  27
## 66345                0                        3.496757e-01  48
## 94722                0                        2.604933e-02  45
## 56156                0                        1.509718e-01  53
## 38733                0                        5.951206e-01  47
## 89830                0                        7.116288e-01  44
## 2754                 0                        5.069155e-01  66
## 124565               0                        5.328575e-01  57
## 89894                0                        2.776312e-01  45
## 36477                0                        2.714106e-02  72
## 8118                 0                        9.999999e-01  40
## 96294                0                        5.420633e-01  40
## 101364               0                        8.872902e-01  47
## 95705                0                        9.999999e-01  31
## 43697                0                        3.098587e-01  82
## 144045               0                        1.460544e-01  60
## 21457                0                        5.264360e-03  52
## 81097                0                        0.000000e+00  52
## 42269                0                        3.557749e-01  67
## 147214               0                        0.000000e+00  52
## 117393               0                        1.784911e-02  68
## 22992                0                        3.722871e-02  44
## 16678                0                        5.584717e-01  26
## 59243                0                        0.000000e+00  35
## 53349                0                        1.361767e-01  43
## 112348               0                        1.592259e-02  74
## 11230                0                        0.000000e+00  40
## 144130               0                        9.999999e-01  53
## 28933                0                        8.647644e-03  52
## 97382                0                        1.316002e-01  63
## 128678               0                        3.003998e-01  24
## 112572               0                        4.449817e-01  68
## 89732                0                        8.100538e-02  74
## 53639                0                        2.481560e-01  41
## 59455                0                        1.115125e-02  30
## 53591                0                        6.797416e-01  28
## 132229               0                        8.800898e-01  38
## 31170                0                        5.007771e-02  62
## 119046               0                        7.551245e-01  41
## 138338               0                        4.575111e-01  53
## 115461               0                        1.007167e+00  40
## 103047               0                        9.999999e-01  39
## 143135               0                        3.880768e-02  30
## 71667                0                        4.842579e-01  57
## 63070                0                        1.491176e-02  67
## 88587                0                        9.999999e-01  24
## 119923               0                        9.273127e-02  84
## 63202                0                        2.888825e-01  37
## 81071                0                        3.596320e-01  81
## 89459                0                        5.168316e-01  37
```

```
## 20991                0                          2.330124e-02  68
## 139942               0                          8.650571e-01  59
## 85880                0                          8.519038e-02  45
## 132581               0                          8.622468e-01  53
## 49724                0                          1.625200e-01  62
## 80517                0                          2.581083e-03  75
## 122487               0                          0.000000e+00  58
## 67935                0                          1.699708e-01  52
## 50539                0                          2.323835e-02  31
## 67154                0                          8.989094e-02  43
## 54813                0                          2.625506e-02  52
## 52658                0                          9.752195e-01  47
## 134119               0                          1.340746e-01  44
## 9443                 0                          1.543335e-01  40
## 3747                 0                          2.177783e-01  27
## 61376                0                          9.891505e-01  58
## 116305               0                          1.689014e-01  49
## 53879                0                          3.788782e-01  40
## 70324                0                          1.623577e-02  57
## 148548               0                          3.146256e-02  39
## 5829                 0                          1.417905e-01  38
## 86013                0                          6.874148e-01  48
## 30709                0                          8.454746e-01  26
## 98712                0                          9.820359e-01  30
## 104601               0                          4.526705e-02  62
## 66969                0                          9.999999e-01  66
## 74474                0                          9.231360e-03  63
## 1997                 0                          9.999999e-01  23
## 24862                0                          9.023503e-01  56
## 145047               0                          9.762802e-01  39
## 86885                0                          1.216523e-01  58
## 101024               0                          9.999999e-01  48
## 107100               0                          9.278534e-02  65
## 143930               0                          2.612787e-01  47
## 54026                0                          1.533717e-01  50
## 138837               0                          0.000000e+00  21
## 61407                0                          2.790625e-01  46
## 18017                0                          9.089710e-01  46
## 83752                0                          1.324669e-02  27
## 62959                0                          3.813452e-02  58
## 126215               0                          2.715973e-01  60
## 119773               0                          7.968416e-01  45
## 137805               0                          9.999999e-01  29
## 60430                0                          4.144106e-01  32
## 64532                0                          4.359063e-01  38
## 71462                0                          1.385034e-01  54
## 96433                0                          3.166415e-02  47
## 1083                 0                          2.471358e-01  34
## 71858                0                          2.665015e-02  42
## 22615                0                          0.000000e+00  28
## 118791               0                          2.891186e-01  73
## 148356               0                          2.172906e-01  61
## 134595               0                          2.275963e-02  57
## 109914               0                          7.324492e-01  49
```

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## 53297                0                          2.818950e-04  86
## 26210                0                          2.029082e-01  58
## 129243               0                          5.765856e-03  34
## 61974                0                          4.422530e-02  45
## 136157               0                          5.369630e-01  58
## 47223                0                          0.000000e+00  51
## 115057               0                          2.455861e-02  64
## 147399               0                          6.298740e-01  26
## 40322                0                          9.666956e-01  50
## 148901               0                          8.595170e-02  60
## 15311                0                          9.435216e-01  39
## 92644                0                          2.228348e-01  53
## 137193               0                          4.123692e-01  47
## 3614                 0                          0.000000e+00  41
## 70104                0                          3.005563e-01  61
## 129752               0                          8.089706e-02  36
## 36373                0                          9.007293e-02  44
## 15108                0                          8.617001e-02  42
## 66502                0                          1.979650e-01  42
## 46092                0                          1.895356e-02  67
## 1162                 0                          1.718597e-02  48
## 121057               0                          7.490515e-01  57
## 112232               0                          1.544228e-01  34
## 101382               0                          1.111944e-01  55
## 53325                0                          8.977968e-01  48
## 19470                0                          0.000000e+00  29
## 28449                0                          2.169955e-01  62
## 12069                0                          4.068640e-02  56
## 51864                0                          5.751372e-01  36
## 60061                0                          5.300127e-01  38
## 127849               0                          6.314105e-03  90
## 130581               0                          1.306874e-02  74
## 14389                0                          9.999999e-01  50
## 124485               0                          8.851149e-01  22
## 125356               0                          4.700127e-02  39
## 134836               0                          4.695015e-01  62
## 32032                0                          2.037394e-01  56
## 135103               0                          8.656285e-01  27
## 2654                 0                          8.435112e-02  81
## 129169               0                          7.625811e-01  60
## 28646                0                          7.016488e-01  45
## 51121                0                          5.921893e-03  64
## 130969               0                          3.636433e-01  32
## 71191                0                          3.154225e-02  59
## 148889               0                          0.000000e+00  50
## 31930                0                          9.606073e-01  66
## 9679                 0                          1.002731e-01  38
## 47351                0                          0.000000e+00  27
## 119258               0                          9.369513e-02  76
## 10683                0                          1.925208e-02  66
## 148633               0                          1.872973e-02  58
## 23072                0                          5.131422e-01  60
## 138920               0                          4.611076e-01  71
## 133244               0                          2.309615e-01  44
```

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## 90248                0                        5.784711e-02  42
## 99620                0                        9.446580e-01  24
## 88565                0                        4.538139e-03  49
## 54306                0                        4.098639e-02  49
## 120321               0                        1.465060e-01  77
## 24733                0                        3.269272e-01  49
## 134002               0                        2.711949e-02  56
## 66083                0                        9.999999e-01  65
## 12413                0                        2.045592e-01  73
## 25802                0                        1.437811e-01  39
## 33546                0                        1.108051e-01  47
## 28084                0                        2.822408e-02  48
## 11425                0                        1.657409e-01  26
## 56159                0                        9.016197e-01  31
## 10250                0                        0.000000e+00  74
## 8726                 0                        8.653608e-03  47
## 149398               0                        4.525929e-01  81
## 2305                 0                        2.790689e-02  76
## 48036                0                        4.439516e-01  43
## 36433                0                        7.836110e-01  47
## 105217               0                        7.016082e-02  58
## 40487                0                        3.483690e-02  77
## 51759                0                        1.590469e-01  30
## 106561               0                        8.770604e-01  48
## 34316                0                        9.807805e-01  43
## 99196                0                        5.295237e-01  54
## 124613               0                        4.704538e-02  71
## 71396                0                        3.330089e-02  80
## 47301                0                        2.973490e-01  46
## 132907               0                        2.117113e-02  67
## 28898                0                        1.868234e-01  44
## 107190               0                        0.000000e+00  77
## 42663                0                        6.187741e-01  39
## 58025                0                        1.133369e-01  74
## 98801                0                        7.320049e-02  42
## 48214                0                        3.481658e-01  41
## 85159                0                        7.228564e-01  40
## 122621               0                        9.999999e-01  47
## 143330               0                        4.453424e-02  81
## 136471               0                        7.036477e-02  43
## 126926               0                        1.529077e-03  58
## 130491               0                        3.759475e-01  30
## 98197                0                        9.999999e-01  48
## 29565                0                        6.057735e-01  53
## 142061               0                        9.999999e-01  35
## 18642                0                        1.125371e-02  74
## 102208               0                        1.516914e-02  83
## 18078                0                        6.750471e-01  77
## 95355                0                        8.708231e-01  45
## 128497               0                        2.759037e-01  59
## 96235                0                        3.646016e-03  42
## 102318               0                        5.264344e-01  31
## 146073               0                        5.301614e-01  33
## 89951                0                        2.962638e-01  48
```

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## 59543          0                    2.387538e-01  80
## 102306         0                    8.511185e-02  51
## 22828          0                    5.405465e-01  34
## 88184          0                    3.893653e-01  62
## 3617           0                    3.167150e-01  83
## 40065          0                    1.909697e-01  51
## 104871         0                    9.999999e-01  54
## 77171          0                    1.686919e-02  64
## 87436          0                    7.003919e-01  49
## 129978         0                    1.026398e-01  31
## 24209          0                    1.399813e-01  72
## 50823          0                    3.533156e-01  34
## 141028         0                    3.410795e-01  45
## 36376          0                    4.118091e-01  58
## 25913          0                    9.999999e-01  36
## 15016          0                    1.186801e-01  44
## 64762          0                    8.635742e-03  70
## 80558          0                    0.000000e+00  34
## 36251          0                    5.712917e-02  63
## 93315          0                    7.306076e-02  49
## 64837          0                    6.771228e-01  27
## 133294         0                    3.409486e-02  48
## 62229          0                    7.510161e-01  41
## 145483         0                    1.665674e-01  54
## 16305          0                    3.208859e-02  71
## 66022          0                    7.368986e-01  71
## 8831           0                    6.334671e-02  65
## 123674         0                    5.554191e-02  64
## 46467          0                    3.824122e-01  39
## 133562         0                    2.140517e-02  76
## 123327         0                    4.494137e-01  56
## 113680         0                    2.821944e-02  69
## 14862          0                    4.073768e-01  41
## 145677         0                    6.014466e-01  44
## 77433          0                    5.169117e-02  65
## 68576          0                    3.409802e-01  52
## 74867          0                    2.083225e-02  73
## 70891          0                    0.000000e+00  46
## 118510         0                    9.999999e-01  42
## 45378          0                    9.999999e-01  57
## 27615          0                    4.925025e-01  52
## 149996         0                    4.067386e-02  74
## 70399          0                    1.983063e-01  59
## 82599          0                    8.271030e-02  37
## 31692          0                    3.161822e-01  40
## 120241         0                    4.950261e-01  34
## 7002           0                    1.717799e-01  50
## 100364         0                    6.113706e-01  58
## 66472          0                    1.280762e-01  58
## 111519         0                    4.269775e-01  65
## 15406          0                    1.855130e-02  52
## 114428         0                    1.301381e-02  41
## 36219          0                    6.648525e-01  61
## 55478          0                    7.497941e-01  40
```

```
## 141238                0                          9.999999e-01  31
## 128824                0                          6.015999e-01  63
## 15767                 0                          0.000000e+00  57
## 113715                0                          3.339896e-01  64
## 141058                0                          9.999999e-01  55
## 140718                0                          9.550357e-02  58
## 142591                0                          9.999999e-01  33
## 32810                 0                          9.999999e-01  62
## 8482                  0                          4.976276e-01  48
## 108855                0                          3.735073e-01  32
## 99140                 0                          5.604334e-01  48
## 64709                 0                          6.266412e-01  46
## 26521                 0                          1.728780e-01  36
## 138556                0                          0.000000e+00  37
## 145777                0                          6.016999e-01  41
## 117626                0                          1.492936e-01  80
## 124319                0                          2.414463e-01  60
## 70663                 0                          6.486486e-01  24
## 124772                0                          9.999999e-01  53
## 25733                 0                          2.458015e-01  52
## 135692                0                          0.000000e+00  33
## 63689                 0                          9.999999e-01  34
## 98481                 0                          3.259083e-01  29
## 120495                0                          1.649794e-02  73
## 83656                 0                          6.939950e-04  43
## 87843                 0                          2.240719e-01  50
## 31136                 0                          7.312271e-03  50
## 3105                  0                          4.630344e-01  28
## 129557                0                          3.713899e-02  57
## 80285                 0                          1.103193e-01  52
## 41093                 0                          1.019238e-01  56
## 73633                 0                          2.016773e-02  76
## 57680                 0                          0.000000e+00  62
## 60529                 0                          9.540918e-01  32
## 74599                 0                          9.999999e-01  39
## 70931                 0                          7.065206e-01  44
## 148678                0                          1.477971e-02  76
## 102743                0                          1.039480e-01  27
## 106085                0                          1.968188e-01  57
## 134147                0                          8.892392e-01  45
## 149883                0                          6.239822e-02  77
## 119225                0                          4.267365e-03  78
## 72035                 0                          3.727530e-02  59
## 103802                0                          1.028388e-03  73
## 49154                 0                          4.973005e-01  39
## 115590                0                          9.654512e-01  36
## 126658                0                          5.031118e-01  65
## 4667                  0                          8.392575e-02  67
## 83153                 0                          1.387445e-01  29
## 72373                 0                          3.046170e-02  43
## 104336                0                          9.999999e-01  49
## 65716                 0                          6.079200e-02  35
## 5805                  0                          0.000000e+00  58
## 91472                 0                          3.012576e-01  39
```

```
## 63232                0                        0.000000e+00  49
## 99238                0                        1.097093e-03  43
## 8414                 0                        3.728207e-01  57
## 145609               0                        8.787306e-02  33
## 132799               0                        6.654334e-01  67
## 25430                0                        9.999999e-01  30
## 50790                0                        1.629802e-01  66
## 5916                 0                        5.958850e-01  47
## 59943                0                        7.609889e-01  40
## 90137                0                        0.000000e+00  39
## 45421                0                        8.882236e-01  42
## 128728               0                        2.525093e-01  35
## 144431               0                        8.075962e-01  24
## 28438                0                        3.696304e-01  43
## 141497               0                        5.782370e-02  23
## 136380               0                        7.180493e-02  66
## 140340               0                        2.021962e-02  72
## 15224                0                        9.999999e-01  36
## 107443               0                        1.915660e-01  39
## 111575               0                        3.742409e-02  88
## 4734                 0                        9.418731e-02  48
## 14704                0                        5.367847e-01  27
## 105703               0                        9.566320e-02  51
## 48506                0                        1.602255e-02  82
## 45606                0                        0.000000e+00  76
## 52687                0                        2.268566e-01  57
## 27763                0                        8.328442e-02  68
## 7483                 0                        1.010728e-01  69
## 24887                0                        3.808745e-01  57
## 89774                0                        8.702595e-01  58
## 64394                0                        5.371897e-01  55
## 62608                0                        4.559445e-02  53
## 125587               0                        9.999999e-01  65
## 66125                0                        8.940132e-01  62
## 6345                 0                        2.468144e-02  63
## 80097                0                        2.211568e-01  44
## 85102                0                        5.985578e-01  61
## 85530                0                        1.247799e-02  68
## 103259               0                        1.531406e-01  51
## 107375               0                        1.603182e-01  67
## 91729                0                        6.587835e-01  61
## 138298               0                        2.091359e-01  46
## 38578                0                        2.260051e-01  55
## 17124                0                        3.298936e-01  54
## 97418                0                        1.366004e-01  66
## 68500                0                        4.349099e-01  59
## 100885               0                        9.999999e-01  52
## 53107                0                        4.757929e-02  51
## 37017                0                        9.147142e-01  47
## 84268                0                        9.073659e-01  51
## 137200               0                        5.511440e-02  50
## 142168               0                        9.758177e-01  38
## 67249                0                        3.420805e-01  74
## 15852                0                        9.999999e-01  24
```

```
## 93844                0                        7.786889e-01  33
## 28851                0                        1.644518e+00  40
## 108011               0                        0.000000e+00  72
## 79300                0                        6.305589e-02  61
## 96323                0                        3.565375e-01  38
## 84975                0                        8.732169e-01  50
## 77886                0                        2.867381e-01  29
## 33269                0                        1.159747e-01  41
## 43734                0                        8.313053e-02  78
## 90977                0                        1.350770e-01  70
## 86770                0                        0.000000e+00  54
## 6431                 0                        3.874703e-02  53
## 12319                0                        2.101586e-01  50
## 9830                 0                        5.730056e-02  61
## 115235               0                        5.518119e-01  40
## 145360               0                        2.411439e-01  42
## 133215               0                        1.367767e-01  55
## 66021                0                        5.678816e-02  66
## 24543                0                        5.140653e-01  45
## 87827                0                        9.390609e-01  22
## 67624                0                        8.403426e-01  34
## 25840                0                        1.145682e-02  58
## 33759                0                        7.531724e-01  43
## 32736                0                        1.668910e-01  66
## 110230               0                        6.037083e-02  60
## 20875                0                        9.241537e-01  45
## 87507                0                        8.175152e-03  50
## 142320               0                        0.000000e+00  36
## 67022                0                        9.999999e-01  47
## 71105                0                        7.239206e-03  68
## 61976                0                        3.735429e-02  32
## 72559                0                        5.497251e-03  43
## 105742               0                        7.199778e-03  35
## 31442                0                        1.152378e-01  40
## 60440                0                        0.000000e+00  61
## 57220                0                        1.297284e-02  56
## 1699                 0                        8.186597e-01  58
## 90790                0                        5.870688e-01  39
## 129261               0                        2.195651e-02  52
## 97575                0                        3.120368e-01  51
## 89800                0                        1.394287e-01  39
## 147528               0                        2.799262e-02  90
## 145159               0                        7.661879e-01  56
## 79284                0                        5.389518e-01  24
## 27351                0                        1.216676e-01  58
## 97667                0                        2.735551e-02  52
## 95169                0                        5.340735e-01  27
## 145699               0                        2.147491e-01  51
## 131351               0                        8.114192e-01  45
## 2661                 0                        1.091684e-02  42
## 126808               0                        3.350628e-02  68
## 131878               0                        7.908630e-01  72
## 141006               0                        5.200348e-01  26
## 89731                0                        1.025197e+00  44
```

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## 91222                0                          1.521580e-01  51
## 36494                0                          1.079965e-01  52
## 9290                 0                          3.130344e-02  46
## 4707                 0                          8.962152e-01  47
## 57197                0                          9.665529e-01  40
## 21544                0                          1.466039e-01  56
## 111281               0                          9.999999e-01  38
## 94532                0                          3.192185e-02  77
## 11343                0                          3.966226e-02  33
## 145466               0                          9.999999e-01  28
## 139689               0                          5.531117e-01  46
## 83688                0                          2.804770e-01  62
## 117935               0                          5.608679e-01  52
## 33762                0                          0.000000e+00  44
## 99745                0                          2.440889e-01  46
## 88106                0                          2.371969e-01  34
## 106753               0                          8.652965e-01  27
## 83395                0                          6.140020e-01  62
## 75118                0                          1.864885e-02  52
## 62140                0                          1.424754e-02  83
## 102326               0                          8.840603e-01  44
## 116732               0                          0.000000e+00  39
## 31002                0                          7.778922e-01  33
## 45403                0                          5.837817e-02  24
## 50155                0                          0.000000e+00  56
## 125844               0                          3.560343e-02  62
## 49020                0                          2.979628e-01  37
## 44512                0                          2.511570e-02  66
## 8931                 0                          9.999999e-01  66
## 140192               0                          8.229887e-01  43
## 59547                0                          7.482059e-01  63
## 148486               0                          3.911522e-01  42
## 43453                0                          3.916084e-01  35
## 15256                0                          4.305995e-01  56
## 8306                 0                          8.100209e-02  71
## 126501               0                          3.861263e-02  77
## 37929                0                          3.078059e-01  68
## 136210               0                          1.794065e-02  36
## 132639               0                          8.472500e-03  73
## 108994               0                          3.015855e-01  53
## 23144                0                          5.124149e-01  26
## 66648                0                          9.999999e-01  40
## 57702                0                          0.000000e+00  31
## 55170                0                          2.153269e-01  37
## 113197               0                          3.292455e-01  67
## 98352                0                          3.271947e-01  38
## 144532               0                          6.579178e-01  47
## 7210                 0                          2.441463e-01  76
## 137681               0                          1.638661e-02  53
## 103729               0                          6.555079e-02  62
## 88963                0                          4.737007e-02  87
## 145980               0                          4.671940e-03  36
## 112236               0                          5.456241e-02  55
## 96292                0                          5.484873e-02  40
```

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## 76561                0                          6.748783e-01  76
## 7880                 0                          1.034447e-02  54
## 92058                0                          9.999999e-01  31
## 58949                0                          4.615921e-01  43
## 61491                0                          9.965764e-03  81
## 37459                0                          3.121266e-02  49
## 87817                0                          1.733658e-01  61
## 9308                 0                          0.000000e+00  69
## 92277                0                          7.629130e-02  68
## 78085                0                          9.301126e-01  41
## 135903               0                          9.999999e-01  24
## 119512               0                          6.763719e-01  37
## 33428                0                          0.000000e+00  48
## 5154                 0                          9.763412e-01  52
## 34752                0                          3.294251e-03  56
## 63286                0                          0.000000e+00  69
## 93829                0                          5.686688e-02  74
## 131399               0                          0.000000e+00  34
## 102373               0                          2.438905e-02  35
## 139049               0                          4.278632e-01  69
## 60035                0                          0.000000e+00  26
## 15144                0                          8.059177e-03  62
## 70018                0                          4.187561e-01  63
## 68693                0                          0.000000e+00  40
## 16449                0                          9.762048e-01  28
## 77336                0                          5.398106e-01  37
## 91681                0                          9.999999e-01  64
## 58246                0                          1.861588e-01  56
## 78167                0                          9.999999e-01  55
## 99377                0                          1.374622e-01  62
## 548                  0                          8.482699e-02  59
## 99933                0                          2.388671e-02  80
## 11915                0                          2.175391e-01  49
## 91691                0                          0.000000e+00  51
## 115069               0                          1.624959e-02  65
## 148084               0                          9.999999e-01  44
## 68783                0                          2.249901e-01  66
## 21066                0                          8.093671e-01  35
## 101892               0                          4.742744e-01  55
## 131678               0                          3.190653e-01  36
## 65856                0                          1.407816e-02  66
## 45381                0                          1.087746e-01  37
## 1501                 0                          1.288421e-01  37
## 103093               0                          9.440160e-01  44
## 74131                0                          1.016327e-01  34
## 77022                0                          1.217215e-01  29
## 61187                0                          9.302684e-01  45
## 57607                0                          2.382585e-02  49
## 53014                0                          8.133155e-02  52
## 74293                0                          3.433493e-01  49
## 40721                0                          9.999999e-01  45
## 44731                0                          7.654509e-01  48
## 4984                 0                          1.743575e-01  32
## 79293                0                          9.999999e-01  54
```

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## 108410                0                          3.430514e-01  26
## 45036                 0                          6.539198e-01  56
## 22260                 0                          2.437585e-01  46
## 106047                0                          2.144893e-02  26
## 93212                 0                          6.441571e-01  37
## 42174                 0                          2.838505e-03  57
## 94208                 0                          2.065020e-02  61
## 93066                 0                          9.999999e-01  39
## 73207                 0                          0.000000e+00  63
## 105738                0                          8.366534e-01  67
## 81454                 0                          1.094158e-01  58
## 19449                 0                          8.476305e-01  41
## 120152                0                          3.572352e-01  34
## 142165                0                          1.668747e-02  50
## 2245                  0                          1.841826e-01  73
## 33126                 0                          2.338339e-01  45
## 13223                 0                          1.972019e-01  40
## 37463                 0                          7.832798e-01  62
## 100352                0                          3.125767e-01  31
## 106764                0                          4.438352e-01  31
## 127747                0                          8.030357e-02  32
## 107282                0                          1.944367e-01  63
## 45116                 0                          0.000000e+00  49
## 58848                 0                          3.075536e-01  50
## 1861                  0                          9.999999e-01  45
## 53696                 0                          0.000000e+00  90
## 103922                0                          9.999999e-01  45
## 42006                 0                          8.112793e-02  39
## 142013                0                          4.569817e-01  53
## 109810                0                          2.574871e-02  51
## 78720                 0                          5.632053e-01  43
## 6275                  0                          7.192043e-02  33
## 87211                 0                          7.570121e-01  64
## 89705                 0                          0.000000e+00  56
## 133148                0                          6.175688e-01  42
## 106374                0                          9.794772e-02  65
## 102069                0                          4.741648e-01  54
## 21296                 0                          2.854905e-01  47
## 50327                 0                          7.099432e-01  26
## 3834                  0                          2.636976e-01  57
## 125798                0                          1.295681e-01  36
## 132429                0                          3.053868e-01  55
## 144312                0                          7.746344e-01  49
## 10356                 0                          1.098494e-01  41
## 46423                 0                          1.998145e-02  47
## 98094                 0                          9.999999e-01  42
## 71426                 0                          9.042781e-02  53
## 74180                 0                          3.669136e-01  70
## 147927                0                          3.866929e-01  39
## 61883                 0                          2.215534e-01  45
## 118717                0                          3.091345e-01  67
## 119239                0                          6.671443e-01  27
## 2903                  0                          2.215408e-02  79
## 56682                 0                          2.529708e-01  40
```

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## 71737                0                          1.186118e-02  46
## 59986                0                          3.119792e-02  78
## 74015                0                          3.432044e-01  58
## 15395                0                          1.037772e-01  67
## 31837                0                          6.074023e-01  47
## 40536                0                          4.718830e-01  33
## 66396                0                          7.258399e-01  59
## 7040                 0                          4.128146e-02  44
## 46137                0                          9.999600e-03  44
## 120428               0                          2.835541e-02  42
## 53812                0                          8.712945e-01  55
## 90431                0                          1.294928e-01  53
## 96765                0                          9.014442e-02  64
## 146042               0                          1.767498e-02  40
## 1159                 0                          2.269576e-01  80
## 36138                0                          2.045725e-01  49
## 106613               0                          4.595405e-02  32
## 101788               0                          7.343083e-02  51
## 111064               0                          4.686711e-02  48
## 38172                0                          8.028540e-01  45
## 96032                0                          1.909618e-01  33
## 134614               0                          0.000000e+00  37
## 121180               0                          5.014000e-02  68
## 118181               0                          9.267481e-01  47
## 140933               0                          1.374056e-02  59
## 35710                0                          1.778309e-01  56
## 10161                0                          6.310738e-01  38
## 129575               0                          5.681404e-01  36
## 21712                0                          6.751785e-01  75
## 5746                 0                          4.235398e-02  56
## 16093                0                          3.479502e-03  55
## 38926                0                          9.999999e-01  25
## 45994                0                          1.604846e-01  57
## 131631               0                          4.695305e-02  25
## 137104               0                          4.281429e-02  29
## 50364                0                          7.530444e-02  56
## 115340               0                          2.928760e-01  35
## 143443               0                          3.252947e-03  46
## 138833               0                          9.999999e-01  41
## 64381                0                          0.000000e+00  55
## 140154               0                          1.542951e-01  67
## 33686                0                          2.637841e-02  30
## 145708               0                          8.053227e-01  48
## 67628                0                          3.790284e-02  49
## 82603                0                          6.972704e-02  50
## 30831                0                          6.738180e-01  35
## 66307                0                          5.159019e-02  72
## 70932                0                          1.687240e-01  32
## 40564                0                          7.045908e-01  36
## 94371                0                          4.151795e-01  47
## 109720               0                          4.557746e-03  34
## 111309               0                          4.316564e-02  69
## 71414                0                          1.184291e-02  63
## 48068                0                          2.091368e-01  55
```

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## 95309                0                          7.990627e-02  63
## 75926                0                          5.521068e-01  44
## 136923               0                          2.784032e-01  67
## 95168                0                          2.474794e-02  30
## 77610                0                          1.319358e-01  64
## 84088                0                          1.737913e-01  40
## 100607               0                          3.703520e-01  46
## 41171                0                          1.837124e-01  51
## 36633                0                          0.000000e+00  59
## 106610               0                          9.999999e-01  29
## 132594               0                          9.504692e-01  34
## 85428                0                          1.174721e-01  63
## 51925                0                          2.491735e-02  34
## 27563                0                          1.243223e-02  89
## 22905                0                          3.619061e-02  65
## 14718                0                          1.537855e-01  57
## 121471               0                          1.706569e-01  49
## 148314               0                          3.636636e-01  73
## 89793                0                          1.717888e-02  44
## 143929               0                          1.777008e-01  64
## 73944                0                          1.776115e-02  55
## 62304                0                          4.530573e-01  51
## 5070                 0                          2.987450e-01  27
## 104396               0                          0.000000e+00  28
## 20987                0                          0.000000e+00  80
## 136350               0                          0.000000e+00  62
## 131252               0                          1.795127e-01  64
## 129509               0                          4.527203e-02  37
## 50322                0                          7.430256e-01  64
## 90021                0                          8.600700e-01  69
## 16189                0                          4.367458e-01  66
## 99090                0                          2.398798e-02  57
## 106038               0                          2.971247e-01  67
## 146511               0                          1.125303e-02  44
## 102453               0                          0.000000e+00  43
## 1973                 0                          4.561957e-01  65
## 74573                0                          6.218900e-02  62
## 107452               0                          1.575336e-02  72
## 99904                0                          1.814234e-01  60
## 21249                0                          4.120713e-03  44
## 20367                0                          6.538496e-01  31
## 77914                0                          8.067722e-01  42
## 16607                0                          1.160697e-03  79
## 106708               0                          1.895963e-01  68
## 59208                0                          7.694881e-03  69
## 124568               0                          2.681412e-02  24
## 129501               0                          1.481188e-01  36
## 23524                0                          2.027299e-01  44
## 74397                0                          3.652171e-01  53
## 65394                0                          8.403073e-02  73
## 96203                0                          9.408017e-01  28
## 65902                0                          1.785643e-03  40
## 6390                 0                          5.725511e-01  87
## 144746               0                          8.185521e-01  40
```

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## 74943                0                          6.223620e-02  35
## 106227               0                          5.107176e-02  68
## 5713                 0                          5.291814e-01  58
## 46624                0                          1.796472e-02  43
## 75167                0                          4.820268e-01  49
## 96998                0                          5.342156e-01  57
## 63305                0                          1.047894e-02  45
## 42954                0                          3.406124e-01  34
## 136230               0                          5.251579e-02  82
## 58544                0                          1.569177e-02  63
## 148734               0                          4.173506e-02  45
## 98204                0                          9.787053e-01  44
## 61913                0                          2.242353e-01  55
## 132631               0                          7.378878e-02  70
## 31994                0                          8.264474e-01  54
## 72239                0                          2.295402e-03  67
## 79656                0                          5.563091e-02  44
## 89786                0                          3.173211e-03  64
## 126981               0                          7.490267e-01  73
## 133368               0                          1.456819e-01  59
## 107201               0                          5.323877e-01  47
## 8517                 0                          7.954358e-01  69
## 6714                 0                          9.999999e-01  26
## 18362                0                          2.105263e-01  27
## 56355                0                          0.000000e+00  52
## 64944                0                          3.982375e-01  52
## 58519                0                          9.726831e-03  64
## 90649                0                          7.524882e-02  46
## 129184               0                          3.205364e-02  53
## 44979                0                          9.999999e-01  80
## 91608                0                          1.499964e-02  78
## 9118                 0                          3.261447e-02  71
## 59282                0                          1.786198e-01  50
## 10823                0                          1.453709e-01  53
## 38432                0                          6.669495e-02  43
## 143407               0                          4.395317e-02  37
## 43686                0                          1.794347e-02  63
## 34794                0                          2.499634e-01  56
## 102854               0                          1.723645e-02  30
## 123267               0                          9.999999e-01  62
## 52868                0                          6.219792e-01  57
## 31201                0                          9.999999e-01  66
## 100908               0                          8.961982e-03  44
## 64717                0                          0.000000e+00  72
## 129130               0                          1.706709e-02  74
## 110360               0                          3.764175e-02  73
## 106916               0                          2.932443e-01  68
## 57739                0                          9.726831e-02  40
## 65723                0                          7.958408e-01  26
## 21185                0                          2.574186e-01  64
## 97641                0                          5.401886e-03  71
## 90673                0                          2.073139e-01  46
## 95610                0                          6.526695e-01  62
## 138961               0                          3.564735e-02  61
```

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## 12214                0                          0.000000e+00  51
## 51843                0                          0.000000e+00  29
## 104481               0                          1.944875e-01  59
## 11669                0                          4.631590e-02  69
## 66657                0                          6.776901e-01  64
## 136101               0                          5.534568e-01  47
## 123487               0                          5.733280e-01  49
## 54138                0                          0.000000e+00  58
## 96586                0                          0.000000e+00  34
## 35105                0                          1.339933e-01  32
## 56187                0                          5.764457e-02  48
## 140419               0                          7.232027e-01  30
## 112585               0                          7.834913e-02  64
## 34732                0                          5.810419e-01  39
## 114582               0                          2.322768e-02  48
## 71321                0                          4.226907e-02  80
## 133887               0                          1.729827e-02  67
## 81587                0                          2.015791e-02  51
## 125886               0                          9.198160e-02  29
## 90941                0                          4.007503e-01  37
## 58059                0                          6.138975e-02  52
## 101359               0                          4.613436e-02  64
## 73344                0                          1.596043e-02  39
## 88987                0                          2.881163e-01  26
## 54036                0                          1.974130e-02  80
## 58444                0                          1.500357e-01  61
## 12144                0                          2.525718e-01  58
## 53308                0                          9.999999e-01  35
## 84993                0                          3.658868e-01  36
## 131330               0                          2.693138e-02  65
## 41633                0                          2.785837e-02  60
## 43426                0                          2.979570e-01  45
## 85347                0                          4.893197e-01  35
## 64228                0                          0.000000e+00  51
## 38399                0                          2.427572e-01  24
## 133348               0                          8.955403e-01  49
## 78514                0                          1.819050e-02  82
## 148613               0                          2.471387e-01  50
## 75665                0                          2.889184e-01  58
## 118329               0                          1.917850e-02  38
## 125279               0                          2.284390e-01  56
## 93640                0                          8.659670e-03  74
## 96173                0                          9.999999e-01  40
## 99230                0                          2.698486e-02  81
## 31961                0                          4.204434e-01  49
## 94096                0                          9.999999e-01  43
## 96420                0                          1.116729e-01  46
## 19528                0                          4.912287e-02  48
## 5887                 0                          6.159031e-02  31
## 6989                 0                          1.102168e-01  51
## 138890               0                          4.156462e-01  36
## 50623                0                          3.375807e-01  41
## 22891                0                          0.000000e+00  79
## 86353                0                          1.563251e-01  57
```

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## 8603                    0                          1.647378e-01  39
## 78352                   0                          1.305963e-01  69
## 111083                  0                          1.817146e-01  38
## 88467                   0                          0.000000e+00  39
## 141372                  0                          9.464308e-01  46
## 107906                  0                          9.932023e-03  31
## 118491                  0                          5.094981e-01  28
## 108311                  0                          6.508906e-01  38
## 95191                   0                          9.538077e-01  32
## 36783                   0                          9.422319e-02  61
## 71645                   0                          4.622366e-01  44
## 83452                   0                          1.874928e-01  34
## 133859                  0                          9.295021e-01  48
## 109260                  0                          1.961503e-01  40
## 111303                  0                          0.000000e+00  37
## 3162                    0                          1.591235e-02  47
## 114375                  0                          6.054129e-02  48
## 25649                   0                          9.999999e-01  47
## 21181                   0                          2.580880e-02  23
## 70799                   0                          6.212168e-01  59
## 28562                   0                          9.167708e-01  30
## 83935                   0                          5.180666e-01  63
## 19045                   0                          3.484037e-01  43
## 126435                  0                          0.000000e+00  55
## 141629                  0                          5.279854e-02  64
## 126879                  0                          8.822355e-01  35
## 78398                   0                          5.195467e-01  52
## 141656                  0                          3.806835e-01  30
## 9079                    0                          4.075497e-02  70
## 138731                  0                          2.044695e-02  75
## 44774                   0                          1.033138e+00  28
## 53053                   0                          4.343242e-01  38
## 3212                    0                          1.128766e-01  31
## 135753                  0                          0.000000e+00  45
## 37405                   0                          7.888277e-02  52
## 125247                  0                          2.328530e-02  79
## 55771                   0                          9.999999e-01  28
## 135658                  0                          0.000000e+00  71
## 48567                   0                          3.430476e-02  66
## 103986                  0                          4.645176e-03  47
## 128842                  0                          0.000000e+00  26
## 127376                  0                          1.264582e-01  70
## 36348                   0                          4.255830e-02  86
## 142925                  0                          9.780220e-01  39
## 71233                   0                          4.655217e-01  29
## 10420                   0                          1.954951e-02  73
## 10358                   0                          8.056627e-02  52
## 40470                   0                          1.247290e-02  48
## 85323                   0                          3.749134e-01  67
## 56001                   0                          7.077428e-01  40
## 67011                   0                          5.034190e-02  75
## 137879                  0                          3.939210e-02  58
## 37048                   0                          2.396304e-01  65
## 68539                   0                          2.863462e-02  63
```

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## 148057                0                          5.461700e-02  60
## 123520                0                          9.430986e-01  66
## 31364                 0                          6.681299e-01  74
## 10593                 0                          3.106689e-01  69
## 58557                 0                          2.477790e-02  53
## 10143                 0                          7.520620e-01  36
## 30207                 0                          8.600933e-01  30
## 99823                 0                          1.141993e-01  55
## 107125                0                          9.716028e-01  40
## 59572                 0                          1.464386e-02  46
## 148008                0                          0.000000e+00  61
## 30694                 0                          2.590205e-02  55
## 31352                 0                          1.038147e+00  60
## 97946                 0                          9.483368e-01  49
## 99371                 0                          2.606916e-02  49
## 139759                0                          1.304798e-02  61
## 86179                 0                          6.241607e-02  61
## 25443                 0                          1.886721e-03  36
## 16245                 0                          0.000000e+00  38
## 115931                0                          7.289853e-02  40
## 129572                0                          1.337965e-01  49
## 106868                0                          6.206703e-01  45
## 87793                 0                          3.574319e-01  65
## 142532                0                          2.613289e-01  41
## 58864                 0                          1.445529e-01  66
## 85562                 0                          9.238038e-01  72
## 81301                 0                          6.429707e-02  62
## 96811                 0                          9.999999e-01  25
## 82853                 0                          8.958631e-01  51
## 112543                0                          6.798640e-02  80
## 63621                 0                          8.844116e-01  30
## 114931                0                          9.241853e-02  62
## 147181                0                          1.056453e-01  45
## 141839                0                          2.083899e-02  62
## 112832                0                          2.729615e-01  51
## 20481                 0                          1.789083e-01  51
## 131234                0                          3.413174e-01  32
## 26734                 0                          2.083461e-01  77
## 67711                 0                          8.751650e-01  40
## 58620                 0                          7.132239e-01  59
## 101402                0                          2.428150e-02  45
## 142852                0                          2.293175e-01  51
## 26873                 0                          4.416512e-01  61
## 70209                 0                          9.270699e-02  51
## 96744                 0                          4.892069e-02  42
## 63785                 0                          4.611767e-02  26
## 58893                 0                          0.000000e+00  83
## 55210                 0                          1.517062e-02  76
## 133647                0                          9.999999e-01  38
## 21739                 0                          8.114788e-01  43
## 45337                 0                          1.448347e-01  25
## 6196                  0                          4.586049e-03  51
## 111939                0                          2.189075e-01  58
## 92206                 0                          0.000000e+00  54
```

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## 73587                0                        3.187458e-01  67
## 127253               0                        9.999999e-01  34
## 36460                0                        2.888109e-03  50
## 93359                0                        1.032367e+00  44
## 98820                0                        5.335331e-02  65
## 102300               0                        1.098781e-01  57
## 98684                0                        8.673755e-02  40
## 92804                0                        2.489043e-01  62
## 46274                0                        6.241389e-02  25
## 1211                 0                        0.000000e+00  53
## 62353                0                        7.074416e-03  30
## 58201                0                        2.991811e-02  86
## 128050               0                        8.528808e-02  49
## 122815               0                        7.050174e-01  45
## 102319               0                        1.493148e-02  80
## 56005                0                        7.221344e-01  57
## 35598                0                        1.996672e-02  39
## 68677                0                        1.329179e-01  39
## 91171                0                        5.036140e-02  79
## 108953               0                        3.514269e-02  78
## 74974                0                        2.177587e-01  57
## 84106                0                        7.642150e-04  72
## 124168               0                        8.495421e-02  54
## 26581                0                        5.683893e-02  63
## 65721                0                        9.785116e-02  43
## 129942               0                        5.257437e-01  39
## 68617                0                        8.667373e-01  58
## 9066                 0                        4.762610e-02  31
## 116446               0                        9.896503e-01  40
## 115129               0                        6.270363e-03  52
## 109928               0                        0.000000e+00  23
## 14932                0                        6.648875e-01  45
## 83446                0                        9.999999e-01  50
## 140925               0                        3.756314e-01  28
## 79592                0                        1.233406e-02  85
## 24485                0                        1.966658e-01  36
## 148757               0                        2.787155e-01  46
## 132692               0                        2.505588e-02  67
## 116427               0                        1.706654e-01  38
## 103279               0                        8.516632e-01  44
## 77943                0                        5.908184e-01  22
## 81526                0                        6.138772e-02  63
## 117642               0                        5.073930e-02  41
## 18754                0                        3.978271e-02  41
## 118053               0                        6.672129e-02  64
## 22545                0                        5.663614e-01  34
## 98452                0                        2.032193e-03  61
## 140308               0                        7.835833e-01  43
## 94039                0                        9.120050e-01  45
## 45179                0                        5.172921e-03  48
## 100040               0                        7.789042e-02  39
## 35730                0                        2.472305e-02  54
## 51515                0                        7.584008e-03  34
## 12327                0                        9.792878e-03  87
```

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## 113889                0                          9.999999e-01  38
## 86119                 0                          1.097260e-01  66
## 74249                 0                          0.000000e+00  23
## 144455                0                          3.625715e-01  50
## 94190                 0                          0.000000e+00  36
## 83719                 0                          3.573556e-01  37
## 47187                 0                          1.645716e-02  32
## 36706                 0                          5.141486e-01  50
## 69637                 0                          5.454454e-02  42
## 115320                0                          3.215330e-04  37
## 102595                0                          2.632716e-01  69
## 72787                 0                          1.514566e-01  37
## 130783                0                          3.334177e-02  65
## 19847                 0                          9.031371e-01  40
## 22822                 0                          8.329213e-01  55
## 50418                 0                          1.201209e-02  72
## 55720                 0                          1.983904e-02  35
## 96895                 0                          1.080372e-01  44
## 104598                0                          4.902317e-01  37
## 121789                0                          1.095572e-02  75
## 116606                0                          1.841923e-02  75
## 59426                 0                          9.440572e-03  65
## 37715                 0                          3.781732e-02  59
## 26766                 0                          5.321256e-01  30
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## 3670                  0                          1.129353e+00  57
## 78694                 0                          3.015527e-01  41
## 135318                0                          8.006399e-01  43
## 28485                 0                          4.880947e-02  43
## 68162                 0                          3.120657e-01  47
## 87580                 0                          0.000000e+00  81
## 118479                0                          2.958873e-01  41
## 70950                 0                          0.000000e+00  74
## 25137                 0                          1.064473e-01  45
## 10908                 0                          9.322411e-01  58
## 108488                0                          2.261712e-03  80
## 17977                 0                          8.678637e-01  58
## 32200                 0                          2.044084e-02  72
## 86831                 0                          9.612467e-01  65
## 49039                 0                          0.000000e+00  29
## 27079                 0                          3.329609e-02  48
## 93554                 0                          6.761080e-01  33
## 139702                0                          6.992646e-01  51
## 68344                 0                          2.737726e-01  42
## 99940                 0                          5.698286e-02  71
## 90593                 0                          6.408613e-03  27
## 89313                 0                          6.059611e-03  64
## 110773                0                          1.999960e-04  54
## 32641                 0                          2.949946e-01  41
## 35158                 0                          1.762957e-02  67
## 39501                 0                          1.002281e-01  72
## 133601                0                          9.999999e-01  22
## 88164                 0                          4.053266e-02  39
## 148330                0                          6.352194e-02  72
```

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## 17529                0                          8.381079e-01  28
## 51482                0                          2.447773e-01  61
## 67603                0                          3.797130e-02  71
## 132157               0                          5.011739e-01  49
## 121868               0                          1.953222e-01  76
## 93759                0                          6.758648e-01  73
## 81835                0                          4.416251e-03  84
## 136877               0                          2.734142e-01  37
## 15304                0                          5.603187e-02  33
## 32642                0                          9.427290e-04  52
## 94287                0                          4.447037e-01  48
## 140165               0                          4.315773e-01  51
## 81584                0                          1.009996e+00  31
## 19967                0                          5.141381e-01  55
## 115944               0                          9.275566e-01  26
## 89832                0                          2.115021e-01  41
## 7556                 0                          7.223481e-01  43
## 47606                0                          1.523283e-02  49
## 120331               0                          3.356811e-01  39
## 120400               0                          5.313112e-01  45
## 145663               0                          5.838416e-01  47
## 64652                0                          2.933433e-01  54
## 138939               0                          6.049838e-03  87
## 104230               0                          1.356362e-01  47
## 16594                0                          1.476672e-01  47
## 18569                0                          9.879566e-01  56
## 50746                0                          3.882250e-01  49
## 62055                0                          8.429672e-02  33
## 54787                0                          1.289832e-01  49
## 69721                0                          9.999999e-01  60
## 122007               0                          6.311221e-02  49
## 18071                0                          2.940568e-02  83
## 62309                0                          1.876634e-02  33
## 29767                0                          0.000000e+00  73
## 124112               0                          0.000000e+00  57
## 64290                0                          7.414552e-01  46
## 78313                0                          1.606539e-01  33
## 144079               0                          4.861125e-02  66
## 42630                0                          9.999999e-01  29
## 100105               0                          0.000000e+00  61
## 135280               0                          8.524858e-02  67
## 126610               0                          2.788401e-02  54
## 27973                0                          7.839111e-02  31
## 82679                0                          2.618527e-01  63
## 117945               0                          8.628438e-02  72
## 81330                0                          2.652017e-01  33
## 82899                0                          9.999999e-01  30
## 77439                0                          0.000000e+00  40
## 109225               0                          4.141884e-01  31
## 8247                 0                          1.286767e-01  35
## 33842                0                          9.055881e-03  65
## 33959                0                          1.121591e-02  87
## 109582               0                          6.047555e-01  87
## 53919                0                          6.098071e-01  60
```

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## 39689                0                        4.373217e-03  67
## 105607               0                        3.795238e-02  42
## 76951                0                        3.486614e-02  51
## 39082                0                        3.261487e-02  38
## 79711                0                        9.976601e-01  58
## 132687               0                        5.065946e-01  50
## 10971                0                        7.355071e-02  41
## 60709                0                        1.352388e-03  56
## 104987               0                        9.463480e-01  38
## 81696                0                        3.630277e-02  34
## 10371                0                        7.667163e-02  64
## 26531                0                        3.930243e-02  59
## 125452               0                        7.426361e-03  55
## 65777                0                        9.999999e-01  26
## 79956                0                        2.712754e-02  41
## 129567               0                        1.432285e-01  52
## 77740                0                        7.957534e-02  37
## 26651                0                        7.499250e-01  45
## 12000                0                        3.983218e-02  59
## 77558                0                        6.665930e-04  31
## 10711                0                        7.333544e-01  35
## 10421                0                        1.739229e-01  43
## 4261                 0                        0.000000e+00  41
## 62004                0                        1.655834e-02  63
## 101826               0                        9.329558e-03  41
## 36335                0                        5.442656e-02  47
## 70313                0                        2.679591e-02  43
## 46010                0                        4.807097e-01  68
## 71962                0                        8.972814e-03  54
## 60345                0                        1.803525e-01  65
## 82753                0                        1.808788e-01  60
## 100729               0                        9.999999e-01  51
## 112472               0                        9.593946e-02  59
## 20107                0                        7.613167e-02  48
## 62062                0                        7.031678e-01  65
## 20981                0                        1.200297e-01  33
## 43521                0                        1.949736e-01  51
## 115456               0                        6.231299e-01  68
## 122154               0                        1.158964e-01  42
## 124082               0                        9.452642e-01  46
## 26983                0                        0.000000e+00  29
## 26046                0                        6.511330e-04  35
## 52737                0                        5.845848e-03  55
## 54396                0                        2.036314e-03  45
## 99387                0                        1.944946e-01  47
## 6377                 0                        6.104524e-01  32
## 44133                0                        4.744479e-02  69
## 16794                0                        1.014416e-01  60
## 26300                0                        3.259608e-01  44
## 119014               0                        0.000000e+00  23
## 98659                0                        1.448989e-01  53
## 117301               0                        4.252328e-01  44
## 146279               0                        3.018621e-02  52
## 114287               0                        4.102623e-02  32
```

```
## 122044                0                          5.287160e-04  75
## 97198                 0                          3.374171e-02  55
## 37462                 0                          8.908675e-01  48
## 91564                 0                          7.399260e-02  40
## 75583                 0                          1.762832e-02  38
## 125606                0                          0.000000e+00  66
## 73438                 0                          2.691043e-02  63
## 11129                 0                          3.778310e-02  50
## 461                   0                          9.228762e-02  61
## 117064                0                          9.975375e-02  57
## 44583                 0                          3.848729e-02  24
## 140979                0                          1.350986e-02  37
## 44784                 0                          5.721374e-02  46
## 18312                 0                          3.430439e-01  69
## 71832                 0                          1.371780e+00  31
## 56775                 0                          8.151330e-01  66
## 34169                 0                          2.575559e-02  49
## 329                   0                          2.842362e-01  45
## 134669                0                          9.999999e-01  51
## 122965                0                          1.072532e-01  43
## 74071                 0                          9.003951e-01  51
## 130677                0                          3.580636e-01  54
## 49430                 0                          2.429913e-01  44
## 147522                0                          9.602104e-03  81
## 27254                 0                          2.068912e-01  42
## 129066                0                          5.713544e-03  37
## 3232                  0                          2.551276e-01  33
## 67205                 0                          9.448197e-01  60
## 76027                 0                          8.217604e-01  60
## 109176                0                          6.563415e-01  56
## 111302                0                          4.180591e-03  39
## 101854                0                          1.069530e+00  47
## 132285                0                          2.004506e-01  57
## 41312                 0                          8.347584e-03  65
## 149148                0                          9.999999e-01  52
## 48477                 0                          0.000000e+00  38
## 36278                 0                          1.235886e-03  82
## 76404                 0                          9.999999e-01  34
## 27927                 0                          2.046842e-02  56
## 140969                0                          7.133185e-02  53
## 135625                0                          1.006340e+00  42
## 61197                 0                          4.105081e-01  29
## 35455                 0                          1.245169e-01  54
## 54576                 0                          1.566265e-01  45
## 33554                 0                          1.838168e-03  53
## 112698                0                          6.391219e-01  58
## 48675                 0                          2.427757e-01  76
## 17438                 0                          2.873366e-02  79
## 24174                 0                          9.702900e-01  69
## 59892                 0                          1.015367e+00  67
## 145824                0                          1.798753e-01  36
## 101931                0                          2.112860e-02  67
## 26259                 0                          2.932942e-03  52
## 83051                 0                          4.393876e-03  63
```

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## 140578                0                          7.281396e-02  69
## 126413                0                          9.924804e-02  52
## 135468                0                          7.221219e-02  65
## 11661                 0                          1.034057e-01  38
## 116595                0                          1.226396e-01  38
## 75932                 0                          0.000000e+00  59
## 102539                0                          5.993375e-02  53
## 136649                0                          1.351685e-01  72
## 35661                 0                          1.170433e-01  36
## 89982                 0                          3.805523e-01  34
## 55738                 0                          5.828343e-01  24
## 82445                 0                          5.071170e-02  74
## 13899                 0                          5.133010e-01  67
## 16826                 0                          4.934330e-01  58
## 59907                 0                          6.003480e-01  79
## 72997                 0                          0.000000e+00  34
## 8771                  0                          3.539097e-01  39
## 46855                 0                          8.225585e-02  36
## 63113                 0                          8.740093e-01  46
## 92538                 0                          6.452857e-02  66
## 81451                 0                          7.324294e-02  42
## 10441                 0                          4.999868e-02  69
## 119163                0                          3.639564e-01  50
## 22518                 0                          4.666958e-01  32
## 90117                 0                          2.179828e-01  59
## 58873                 0                          4.179960e-02  49
## 87072                 0                          9.930769e-02  75
## 105549                0                          1.024637e-01  77
## 85655                 0                          0.000000e+00  34
## 142523                0                          4.671183e-01  78
## 66457                 0                          1.006915e-01  58
## 122565                0                          1.412011e-02  55
## 53477                 0                          8.351586e-02  53
## 5184                  0                          2.279271e-02  40
## 63062                 0                          4.533082e-02  60
## 26887                 0                          9.258590e-01  41
## 21105                 0                          3.617999e-01  30
## 71390                 0                          2.699365e-01  40
## 37901                 0                          6.460639e-03  93
## 132897                0                          6.661052e-01  46
## 101170                0                          2.274538e-01  26
## 35135                 0                          8.884424e-01  52
## 149699                0                          5.746994e-03  59
## 28963                 0                          9.999999e-01  70
## 111179                0                          9.558407e-01  48
## 23838                 0                          3.938142e-01  35
## 4012                  0                          6.152230e-01  58
## 74676                 0                          8.097962e-02  76
## 47633                 0                          1.994346e-01  79
## 54668                 0                          6.104847e-02  52
## 48348                 0                          9.580000e+02  40
## 80634                 0                          8.476347e-02  31
## 48619                 0                          6.631671e-01  30
## 109430                0                          5.776825e-01  50
```

```
## 3436                0                    6.253409e-02  28
## 97578               0                    0.000000e+00  39
## 134220              0                    3.167873e-01  30
## 71870               0                    4.838662e-01  45
## 16054               0                    1.695463e-01  51
## 83578               0                    1.699989e-01  53
## 101394              0                    1.087324e-02  71
## 96610               0                    6.885290e-01  48
## 87217               0                    2.366612e-01  53
## 104433              0                    2.769089e-03  70
## 18155               0                    3.740056e-01  52
## 69850               0                    1.520606e-02  75
## 125902              0                    1.337918e-02  45
## 113278              0                    2.725233e-01  55
## 59273               0                    2.903816e-01  46
## 16320               0                    9.117217e-01  44
## 134329              0                    6.605043e-02  47
## 53322               0                    1.172998e-02  64
## 143953              0                    9.999999e-01  61
## 44443               0                    9.999999e-01  60
## 3498                0                    7.260127e-01  48
## 8356                0                    2.725662e-01  56
## 84142               0                    1.618279e-01  29
## 7294                0                    9.746700e-01  51
## 57771               0                    7.105789e-01  59
## 40039               0                    2.514685e-01  79
## 89025               0                    7.425174e-01  58
## 102495              0                    6.084927e-01  45
## 59231               0                    4.182107e-02  52
## 135139              0                    2.179877e-02  84
## 691                 0                    8.342668e-02  64
## 109108              0                    6.559884e-01  39
## 139976              0                    1.016281e+00  43
## 55797               0                    1.888665e-02  42
## 7287                0                    0.000000e+00  50
## 104691              0                    2.536581e-01  61
## 101401              0                    9.999999e-01  53
## 105448              0                    9.999999e-01  26
## 120903              0                    3.691834e-02  72
## 43772               0                    2.787122e-01  60
## 80784               0                    9.999999e-01  26
## 39390               0                    1.269968e-02  63
## 45888               0                    8.770176e-01  29
## 33859               0                    1.186201e-01  56
## 124513              0                    5.119302e-02  63
## 59903               0                    7.389835e-01  59
## 126731              0                    2.943336e-02  47
## 76841               0                    5.860073e-01  48
## 94462               0                    9.999999e-01  30
## 66020               0                    1.193808e-01  50
## 136459              0                    9.000769e-01  43
## 74211               0                    2.823397e-01  47
## 47995               0                    9.999999e-01  33
## 126549              0                    0.000000e+00  63
```

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## 98140                0                          7.731753e-01  27
## 39404                0                          3.340053e-01  32
## 116829               0                          6.912461e-02  66
## 78839                0                          4.060797e-01  49
## 148343               0                          7.970277e-01  50
## 97278                0                          9.999999e-01  46
## 3497                 0                          4.456180e-02  59
## 40275                0                          3.310705e-01  55
## 86779                0                          0.000000e+00  49
## 8013                 0                          3.014939e-01  53
## 84086                0                          9.999999e-01  39
## 137165               0                          2.067192e-01  61
## 30380                0                          1.882168e-02  60
## 97133                0                          8.040747e-01  50
## 87133                0                          8.883005e-02  33
## 135175               0                          2.285641e-01  36
## 104594               0                          6.666444e-03  86
## 126233               0                          1.791133e-02  56
## 74502                0                          4.986990e-02  76
## 79170                0                          0.000000e+00  46
## 30475                0                          5.399841e-02  41
## 142537               0                          1.752653e-01  29
## 66501                0                          2.167913e-02  50
## 122642               0                          3.107531e-02  54
## 47529                0                          2.814763e-03  77
## 79502                0                          5.174246e-01  47
## 46281                0                          2.327486e-03  67
## 46373                0                          1.324442e-01  61
## 33487                0                          3.194920e-02  75
## 83600                0                          9.300685e-02  62
## 38852                0                          5.104979e-01  35
## 66744                0                          9.999999e-01  53
## 22613                0                          5.987649e-01  47
## 61505                0                          3.049153e-01  35
## 99488                0                          2.688420e-01  61
## 104663               0                          4.081968e-01  50
## 40201                0                          4.968387e-02  47
## 5852                 0                          1.935421e-03  86
## 64496                0                          4.056050e-01  69
## 24048                0                          2.435026e-01  38
## 145850               0                          1.102729e-03  73
## 55953                0                          1.618581e-01  52
## 69200                0                          0.000000e+00  62
## 95933                0                          2.167832e-01  67
## 111685               0                          0.000000e+00  35
## 141259               0                          1.018994e+00  62
## 28758                0                          2.715455e-01  63
## 105408               0                          2.470070e-02  40
## 40964                0                          5.999538e-02  62
## 99734                0                          7.622534e-02  44
## 90279                0                          9.813721e-01  37
## 66543                0                          7.224684e-02  62
## 46292                0                          1.225958e-01  39
## 78667                0                          4.655297e-02  55
```

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## 112408                0                          3.331178e-02  49
## 97138                 0                          9.999999e-01  41
## 117594                0                          3.696605e-02  46
## 102746                0                          3.693310e-01  56
## 97991                 0                          9.999999e-01  25
## 129141                0                          2.130525e-02  62
## 114932                0                          2.931165e-02  56
## 24444                 0                          6.075738e-02  84
## 56533                 0                          6.563263e-01  27
## 130391                0                          8.123201e-02  83
## 47158                 0                          1.088446e-01  61
## 123114                0                          6.688328e-01  49
## 9409                  0                          2.381392e-01  40
## 39659                 0                          0.000000e+00  36
## 13872                 0                          4.155639e-03  75
## 137331                0                          9.317114e-02  54
## 131287                0                          8.952507e-02  64
## 5545                  0                          4.668237e-01  42
## 88757                 0                          3.113899e-03  42
## 134187                0                          0.000000e+00  47
## 11708                 0                          5.137945e-01  40
## 15191                 0                          1.565491e-01  76
## 86030                 0                          7.693077e-01  27
## 127164                0                          1.876008e-01  88
## 140441                0                          4.469548e-01  51
## 40618                 0                          9.999999e-01  52
## 10066                 0                          5.816866e-01  62
## 112846                0                          1.363633e-01  55
## 117575                0                          7.199467e-02  55
## 132438                0                          9.999999e-01  81
## 62832                 0                          9.467370e-01  30
## 132753                0                          1.240242e-01  41
## 75336                 0                          5.234832e-01  40
## 100649                0                          4.331644e-02  44
## 22523                 0                          9.034942e-01  34
## 135359                0                          2.328996e-02  40
## 55777                 0                          2.513612e-02  38
## 95984                 0                          4.254185e-01  48
## 124213                0                          5.171909e-01  52
## 85983                 0                          6.817617e-01  44
## 50303                 0                          4.444320e-04  65
## 56045                 0                          1.826785e-02  60
## 60619                 0                          9.894159e-01  25
## 147227                0                          9.897172e-01  24
## 30503                 0                          3.609668e-02  79
## 143020                0                          1.061176e+00  61
## 120720                0                          3.374706e-01  52
## 62848                 0                          2.136016e-01  61
## 130312                0                          2.382750e-01  41
## 47930                 0                          2.816080e-01  28
## 98226                 0                          0.000000e+00  87
## 2256                  0                          6.946843e-01  62
## 22517                 0                          2.244171e-02  69
## 103788                0                          1.509240e-01  58
```

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## 130763                0                          5.662305e-01  35
## 1087                  0                          8.663445e-01  34
## 35351                 0                          6.665128e-02  50
## 48046                 0                          6.428110e-04  60
## 81276                 0                          8.539369e-03  81
## 115010                0                          9.769756e-02  54
## 108160                0                          7.036837e-02  41
## 112302                0                          3.984679e-03  51
## 81168                 0                          5.396654e-02  46
## 44465                 0                          0.000000e+00  51
## 4062                  0                          4.782832e-02  64
## 133756                0                          5.420781e-01  41
## 119612                0                          0.000000e+00  30
## 89172                 0                          1.968670e-02  68
## 133678                0                          2.107578e-01  75
## 63994                 0                          5.984268e-03  51
## 59551                 0                          1.793259e-03  57
## 6608                  0                          1.292433e-02  43
## 138868                0                          1.143109e-01  75
## 77027                 0                          5.445879e-01  66
## 56010                 0                          1.091297e-01  57
## 38854                 0                          8.318779e-01  38
## 67098                 0                          9.502443e-01  36
## 1084                  0                          9.999999e-01  43
## 30713                 0                          5.063233e-02  68
## 50796                 0                          3.206914e-02  56
## 121850                0                          9.999999e-01  52
## 32571                 0                          7.151806e-01  31
## 19196                 0                          5.161399e-01  52
## 37495                 0                          4.241664e-02  64
## 62027                 0                          9.999999e-01  24
## 105008                0                          7.449628e-01  40
## 28940                 0                          3.940382e-02  59
## 127877                0                          6.653746e-01  63
## 60218                 0                          1.238948e-01  65
## 139427                0                          3.436196e-02  49
## 6888                  0                          3.972787e-01  67
## 83308                 0                          0.000000e+00  33
## 143118                0                          5.852942e-02  63
## 63957                 0                          6.234634e-02  29
## 63363                 0                          6.597290e-01  62
## 97203                 0                          2.278387e-02  62
## 149826                0                          3.355431e-01  43
## 401                   0                          1.341915e-01  63
## 112362                0                          5.844650e-03  80
## 71156                 0                          1.342605e-01  70
## 35327                 0                          0.000000e+00  28
## 59961                 0                          4.374790e-02  43
## 121795                0                          0.000000e+00  64
## 133664                0                          2.617829e-02  49
## 146016                0                          9.999999e-01  30
## 123449                0                          7.468949e-01  45
## 139085                0                          6.026795e-01  44
## 133934                0                          9.999999e-01  47
```

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## 41782                0                          3.158947e-02  35
## 35089                0                          2.350724e-01  62
## 40281                0                          9.788377e-03  80
## 65531                0                          8.775374e-01  54
## 102275               0                          9.490735e-01  40
## 68212                0                          7.655362e-01  56
## 83080                0                          1.314604e-02  73
## 78107                0                          1.704657e-02  85
## 23903                0                          2.382586e-01  51
## 67                   0                          7.508737e-01  55
## 82600                0                          3.968931e-02  47
## 54199                0                          2.953459e-01  59
## 120465               0                          7.593169e-01  54
## 62973                0                          1.811623e-02  43
## 66710                0                          2.816591e-02  70
## 43557                0                          6.733779e-01  34
## 141722               0                          1.109663e-03  58
## 117025               0                          4.613999e-01  31
## 88533                0                          9.207761e-01  64
## 116973               0                          6.585383e-02  48
## 118367               0                          2.532554e-02  74
## 130293               0                          1.312870e-01  58
## 128346               0                          0.000000e+00  46
## 48837                0                          3.819270e-01  50
## 115962               0                          9.999999e-01  80
## 134741               0                          9.761800e-01  57
## 83877                0                          4.824879e-03  67
## 56731                0                          6.086525e-02  36
## 83662                0                          2.686567e-01  31
## 54305                0                          1.096428e-01  37
## 76568                0                          1.094565e-02  30
## 108816               0                          2.801823e-03  59
## 92641                0                          7.637828e-02  73
## 101693               0                          4.067115e-01  49
## 94901                0                          6.943850e-02  51
## 119986               0                          1.142820e-04  48
## 147026               0                          4.506291e-01  29
## 64596                0                          2.133270e-01  71
## 99868                0                          1.216060e-01  31
## 2074                 0                          3.775889e-01  34
## 62604                0                          7.220192e-02  47
## 116383               0                          0.000000e+00  69
## 19701                0                          0.000000e+00  40
## 91221                0                          0.000000e+00  55
## 143989               0                          4.309046e-01  34
## 28032                0                          3.179473e-02  85
## 28909                0                          3.470020e-02  36
## 12598                0                          3.210030e-03  49
## 55898                0                          6.281228e-01  42
## 2001                 0                          1.194621e-02  54
## 53834                0                          0.000000e+00  74
## 66400                0                          1.566867e-02  60
## 147326               0                          9.568949e-01  48
## 138207               0                          1.305721e-02  31
```

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## 31030                0                        7.511076e-02  39
## 79799                0                        9.371734e-02  56
## 138889               0                        9.999999e-01  63
## 137353               0                        8.570408e-01  35
## 117282               0                        3.576872e-02  60
## 144781               0                        8.633004e-02  32
## 38237                0                        0.000000e+00  38
## 123729               0                        3.880960e-02  45
## 32829                0                        0.000000e+00  66
## 111146               0                        3.002833e-01  42
## 144761               0                        0.000000e+00  39
## 78895                0                        1.235997e-01  64
## 3847                 0                        1.941431e-01  54
## 12770                0                        3.526916e-01  59
## 21780                0                        4.063885e-02  50
## 72862                0                        5.972453e-01  78
## 39664                0                        7.915403e-01  63
## 147648               0                        5.841643e-02  44
## 49911                0                        9.923089e-01  55
## 98525                0                        6.552067e-03  68
## 39734                0                        0.000000e+00  40
## 15293                0                        0.000000e+00  54
## 92603                0                        3.101138e-02  80
## 52390                0                        1.558087e-01  66
## 22332                0                        4.012190e-01  27
## 99790                0                        8.157444e-01  39
## 28505                0                        7.593157e-02  57
## 179                  0                        0.000000e+00  41
## 141941               0                        5.353379e-02  71
## 143978               0                        6.389252e-02  46
## 28162                0                        1.496494e+00  48
## 36474                0                        3.369465e-02  27
## 130013               0                        2.741634e-02  54
## 77118                0                        1.697553e-01  37
## 59253                0                        7.911289e-01  48
## 105014               0                        4.027818e-02  43
## 25339                0                        2.547114e-01  51
## 17781                0                        8.656878e-02  35
## 97303                0                        9.999999e-01  43
## 51365                0                        5.013023e-01  46
## 142787               0                        9.999999e-01  49
## 137285               0                        9.530926e-01  49
## 111844               0                        8.502075e-01  31
## 52411                0                        1.203671e-01  42
## 42918                0                        8.922737e-01  31
## 91856                0                        0.000000e+00  61
## 528                  0                        5.518899e-01  42
## 138086               0                        4.558228e-01  26
## 39520                0                        2.910522e-01  63
## 68153                0                        0.000000e+00  29
## 13698                0                        8.258481e-02  51
## 20529                0                        9.301165e-01  44
## 100779               0                        9.696550e-02  33
## 113654               0                        1.242189e-01  64
```

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## 8253                0                        7.726818e-02  44
## 26905               0                        7.500313e-01  38
## 7884                0                        6.600128e-01  40
## 69832               0                        1.526934e-01  62
## 143426              0                        1.721662e-01  28
## 39870               0                        1.273958e-01  80
## 90034               0                        4.337170e-02  67
## 37550               0                        1.101570e-01  69
## 68694               0                        5.436587e-02  35
## 98548               0                        5.110372e-02  81
## 109321              0                        7.362967e-03  28
## 38408               0                        3.476807e-01  73
## 139790              0                        9.999999e-01  27
## 119542              0                        1.029016e-02  83
## 5147                0                        2.044398e-01  62
## 79369               0                        1.741304e-01  53
## 50336               0                        8.132747e-01  27
## 104719              0                        2.829303e-01  36
## 85533               0                        8.533730e-03  49
## 47490               0                        5.042137e-02  30
## 103843              0                        9.999999e-01  52
## 93772               0                        5.732767e-01  51
## 74642               0                        1.315658e-01  27
## 106033              0                        4.302126e-02  58
## 89927               0                        9.639691e-01  34
## 5542                0                        6.470687e-01  61
## 32416               0                        1.760474e-01  44
## 74827               0                        7.437844e-01  63
## 129219              0                        1.694983e-02  60
## 106621              0                        1.514998e-01  72
## 100972              0                        1.284566e-02  64
## 60441               0                        2.854459e-02  59
## 122500              0                        5.165664e-01  38
## 119705              0                        8.972276e-02  42
## 34234               0                        3.126239e-02  58
## 135562              0                        1.738283e-01  53
## 5982                0                        1.577163e-01  58
## 136711              0                        2.231576e-01  63
## 107323              0                        5.838761e-01  56
## 19362               0                        1.088890e-01  48
## 37705               0                        8.607848e-01  32
## 71538               0                        2.756782e-01  66
## 92993               0                        7.926689e-01  50
## 71160               0                        3.139686e-02  71
## 18869               0                        3.531830e-01  56
## 3133                0                        5.067173e-01  68
## 21808               0                        7.882113e-01  39
## 14648               0                        2.016777e-01  77
## 92840               0                        2.691265e-02  62
## 59874               0                        5.934937e-02  57
## 120243              0                        9.999999e-01  25
## 18106               0                        2.588178e-02  78
## 127546              0                        9.993338e-03  23
## 15626               0                        8.327874e-01  23
```

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## 34050                0                          2.874223e-01  60
## 74390                0                          1.467125e-03  74
## 50538                0                          5.002714e-02  64
## 117336               0                          1.704403e-01  74
## 142311               0                          3.402339e-02  73
## 134565               0                          1.732510e-03  77
## 49941                0                          1.096586e+00  52
## 93258                0                          6.892954e-02  34
## 90032                0                          3.320607e-01  46
## 148426               0                          5.723123e-02  59
## 82333                0                          1.149276e-01  46
## 28138                0                          1.003766e+00  59
## 65061                0                          1.258307e-02  58
## 144080               0                          2.336145e-01  42
## 149191               0                          1.228075e-02  70
## 98535                0                          4.391797e-01  41
## 8815                 0                          1.009388e+00  60
## 132242               0                          1.482766e-01  54
## 17759                0                          0.000000e+00  42
## 12579                0                          4.299713e-02  37
## 89820                0                          9.999999e-01  26
## 120457               0                          7.918265e-02  39
## 66382                0                          1.408634e-02  38
## 79768                0                          8.920958e-01  56
## 11337                0                          3.862016e-01  37
## 25980                0                          1.001000e+00  42
## 29974                0                          9.999999e-01  63
## 107425               0                          9.999999e-01  25
## 81473                0                          6.562138e-01  40
## 137853               0                          9.999999e-01  35
## 24520                0                          9.755152e-01  50
## 64880                0                          9.995363e-01  43
## 19191                0                          4.647398e-02  53
## 86061                0                          6.284733e-01  50
## 100695               0                          4.369782e-02  77
## 6897                 0                          1.107784e+00  37
## 107583               0                          3.564308e-02  27
## 50360                0                          1.029192e-01  62
## 29533                0                          4.015236e-02  57
## 139697               0                          3.166903e-02  49
## 11079                0                          8.521369e-03  63
## 102556               0                          9.299081e-01  67
## 65732                0                          8.482371e-01  43
## 31684                0                          1.166810e-01  26
## 57347                0                          9.999999e-01  46
## 13208                0                          1.501276e-02  72
## 5779                 0                          0.000000e+00  43
## 29109                0                          1.574258e-01  79
## 1563                 0                          6.390820e-01  48
## 65499                0                          1.726106e-01  45
## 117659               0                          4.554545e-02  55
## 34426                0                          4.083796e-02  48
## 146051               0                          2.158892e-01  53
## 22430                0                          6.302476e-01  60
```

```
## 10726                0                        4.460611e-01  59
## 56035                0                        4.433585e-01  66
## 66077                0                        4.662356e-01  55
## 98769                0                        1.793466e-01  36
## 78661                0                        9.999999e-01  35
## 117193               0                        7.446633e-01  51
## 140398               0                        4.932511e-02  30
## 146914               0                        5.957270e-01  28
## 112482               0                        9.930005e-01  40
## 131414               0                        0.000000e+00  32
## 121887               0                        0.000000e+00  63
## 20799                0                        4.008285e-01  48
## 5665                 0                        2.687270e-01  34
## 59073                0                        1.035677e-01  68
## 26452                0                        8.138904e-03  28
## 45671                0                        9.999999e-01  26
## 124779               0                        4.659146e-01  64
## 95152                0                        9.999999e-01  38
## 96688                0                        1.449186e-02  69
## 66818                0                        8.901146e-02  47
## 141721               0                        4.795010e-02  40
## 121338               0                        1.284160e-01  47
## 87049                0                        8.633789e-01  48
## 60609                0                        8.287171e-01  40
## 100591               0                        5.744968e-01  28
## 51411                0                        2.921280e-04  30
## 83990                0                        9.780381e-02  64
## 147078               0                        1.318078e-02  53
## 87174                0                        7.660278e-01  31
## 146716               0                        9.286730e-01  46
## 21109                0                        7.673035e-01  33
## 24992                0                        1.194500e-02  72
## 48930                0                        6.090472e-01  65
## 41425                0                        0.000000e+00  69
## 102881               0                        6.875725e-02  38
## 96329                0                        3.554812e-01  37
## 11057                0                        4.920124e-01  36
## 97429                0                        2.948711e-02  66
## 36570                0                        6.601152e-02  62
## 362                  0                        1.866828e-01  30
## 133163               0                        5.536907e-02  27
## 91070                0                        4.693248e-01  38
## 57997                0                        4.207623e-01  67
## 95764                0                        2.852877e-02  73
## 30947                0                        1.546640e-01  25
## 120042               0                        4.117497e-01  47
## 121871               0                        2.058581e-02  52
## 114843               0                        7.998522e-01  43
## 3185                 0                        9.575300e-01  30
## 57334                0                        1.186374e-01  62
## 125911               0                        4.008371e-01  34
## 83745                0                        2.651026e-01  56
## 28691                0                        4.423823e-02  41
## 29167                0                        4.963517e-02  88
```

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## 6359                    0                          5.220460e-03  56
## 83197                   0                          3.690794e-03  82
## 48986                   0                          9.700561e-01  60
## 18882                   0                          2.036327e-02  73
## 20695                   0                          3.706186e-01  24
## 101902                  0                          3.176679e-01  36
## 69463                   0                          3.702140e-02  55
## 66474                   0                          9.999999e-01  48
## 86937                   0                          1.460357e-01  70
## 75935                   0                          2.733796e-01  40
## 914                     0                          9.999999e-01  36
## 82770                   0                          2.087471e-01  38
## 101995                  0                          2.509100e-01  34
## 120144                  0                          7.771058e-02  27
## 36119                   0                          4.894342e-01  43
## 34902                   0                          3.003808e-01  44
## 25482                   0                          3.841701e-02  36
## 23006                   0                          9.999999e-01  23
## 22007                   0                          5.785082e-02  77
## 25974                   0                          8.012375e-02  64
## 110690                  0                          8.318614e-01  30
## 95261                   0                          2.943882e-02  50
## 20038                   0                          8.097000e-04  58
## 71654                   0                          3.754231e-01  55
## 39862                   0                          9.796020e-01  35
## 26827                   0                          6.287646e-01  61
## 145316                  0                          2.452910e-01  42
## 121726                  0                          5.835711e-02  45
## 149792                  0                          9.999999e-01  32
## 50272                   0                          2.332876e-01  47
## 66450                   0                          3.657391e-01  56
## 3979                    0                          8.299726e-02  45
## 130912                  0                          9.627254e-02  35
## 144934                  0                          9.180546e-01  30
## 45454                   0                          9.415775e-01  63
## 77136                   0                          9.592237e-03  26
## 97111                   0                          1.215151e-01  59
## 73136                   0                          1.816384e-01  36
## 54351                   0                          9.999999e-01  62
## 140700                  0                          8.861658e-01  50
## 3773                    0                          2.510460e-02  73
## 87222                   0                          3.826500e-01  45
## 30920                   0                          4.051293e-01  27
## 109295                  0                          8.946548e-01  34
## 99890                   0                          1.002665e+00  25
## 64868                   0                          2.835921e-02  69
## 139869                  0                          1.042758e-01  46
## 90244                   0                          2.797699e-01  67
## 47414                   0                          9.999999e-01  27
## 123146                  0                          2.239523e-01  40
## 32492                   0                          1.277445e-01  59
## 123568                  0                          4.459703e-02  34
## 131005                  0                          3.284725e-02  63
## 44595                   0                          8.921242e-01  29
```

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## 126169                0                          1.443610e-01  33
## 88977                 0                          7.408754e-03  45
## 127410                0                          3.308396e-01  46
## 136279                0                          3.721310e-01  32
## 48668                 0                          2.307090e-01  35
## 11318                 0                          3.282637e-01  54
## 113286                0                          4.955445e-03  74
## 36192                 0                          7.013759e-01  43
## 141082                0                          0.000000e+00  33
## 29930                 0                          6.561675e-01  63
## 84916                 0                          3.962118e-02  89
## 475                   0                          1.008833e-01  52
## 71318                 0                          7.070878e-01  39
## 39300                 0                          3.322036e-02  66
## 38345                 0                          7.959102e-03  57
## 141532                0                          2.529856e-02  61
## 51022                 0                          6.401671e-01  56
## 118168                0                          0.000000e+00  28
## 48823                 0                          1.163114e-02  48
## 2759                  0                          7.293689e-03  27
## 45120                 0                          2.629357e-01  53
## 60646                 0                          6.055078e-01  45
## 118943                0                          3.360723e-02  75
## 86042                 0                          5.969970e-04  72
## 140755                0                          4.215316e-02  74
## 31869                 0                          1.060847e-01  66
## 106282                0                          4.391971e-02  60
## 2722                  0                          1.232390e-01  57
## 122274                0                          3.544698e-02  42
## 49010                 0                          1.741358e-03  55
## 14407                 0                          5.264735e-01  23
## 70081                 0                          1.128770e-01  53
## 111954                0                          4.329856e-02  67
## 33653                 0                          5.184979e-02  37
## 64633                 0                          3.129443e-01  46
## 666                   0                          5.788494e-01  48
## 94231                 0                          6.472180e-01  29
## 17841                 0                          9.301797e-03  45
## 66514                 0                          0.000000e+00  47
## 11963                 0                          7.811631e-01  48
## 47390                 0                          4.593505e-02  78
## 142246                0                          4.696881e-03  64
## 15569                 0                          7.871798e-01  33
## 75162                 0                          3.154872e-01  59
## 125754                0                          3.714384e-01  43
## 139846                0                          1.398274e-01  75
## 48937                 0                          9.420116e-01  25
## 63382                 0                          6.888309e-01  56
## 37073                 0                          8.838005e-03  59
## 26123                 0                          1.104128e-01  56
## 87702                 0                          2.055017e-01  84
## 31461                 0                          3.845846e-01  44
## 134941                0                          9.345385e-01  51
## 79392                 0                          6.541630e-01  47
```

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## 18193                0                        1.211577e+00  57
## 55262                0                        1.585470e-01  31
## 36756                0                        1.782879e-01  54
## 148258               0                        9.999999e-01  23
## 48041                0                        5.539006e-01  28
## 139800               0                        2.047181e-01  29
## 119698               0                        4.292353e-01  58
## 86056                0                        4.791939e-02  27
## 42599                0                        6.475782e-01  59
## 101011               0                        0.000000e+00  29
## 37094                0                        1.886958e-01  62
## 4869                 0                        7.695459e-01  54
## 9247                 0                        1.145521e-01  64
## 6119                 0                        5.379875e-02  62
## 91192                0                        9.469027e-01  51
## 17021                0                        1.026649e+00  23
## 95865                0                        3.352907e-02  61
## 89204                0                        0.000000e+00  54
## 82825                0                        4.855689e-01  40
## 8221                 0                        2.286371e-01  64
## 18337                0                        2.967547e-01  49
## 121333               0                        2.130237e-02  49
## 89223                0                        3.018564e-01  52
## 28030                0                        2.008742e-01  44
## 45756                0                        0.000000e+00  54
## 121176               0                        8.627585e-01  30
## 87772                0                        2.200131e-02  63
## 117902               0                        3.653409e-01  50
## 144930               0                        2.844381e-02  61
## 98161                0                        3.649296e-01  30
## 61745                0                        4.035354e-02  47
## 130409               0                        3.539829e-01  63
## 32709                0                        6.355788e-01  53
## 85201                0                        2.888675e-03  63
## 69018                0                        0.000000e+00  79
## 88897                0                        1.897953e-01  41
## 65387                0                        2.649610e-01  49
## 135665               0                        1.440390e-01  53
## 68154                0                        1.042431e-01  64
## 7875                 0                        3.702815e-01  77
## 32201                0                        2.017136e-01  51
## 127718               0                        5.773634e-01  30
## 92963                0                        5.908818e-01  29
## 108110               0                        9.140431e-02  75
## 18790                0                        9.860915e-01  43
## 109243               0                        5.908518e-03  78
## 121638               0                        6.079173e-02  64
## 127289               0                        4.578240e-02  42
## 68991                0                        9.659064e-01  51
## 67992                0                        3.055847e-01  43
## 41170                0                        1.664409e-02  48
## 23422                0                        2.619651e-01  29
## 117714               0                        1.936186e-01  51
## 45376                0                        1.643275e-01  48
```

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## 106865                0                          6.130612e-02  54
## 86319                 0                          4.000573e-01  61
## 22293                 0                          8.933084e-01  60
## 122311                0                          4.324168e-01  43
## 69961                 0                          2.666269e-01  46
## 68                    0                          6.799093e-03  27
## 85670                 0                          4.916508e-01  34
## 65641                 0                          9.958337e-01  54
## 137471                0                          5.642143e-03  69
## 93330                 0                          7.333155e-01  45
## 17362                 0                          4.099868e-02  29
## 108538                0                          9.999174e-01  39
## 145749                0                          2.372711e-02  43
## 123387                0                          2.588965e-01  35
## 116921                0                          9.146407e-01  53
## 83218                 0                          1.359256e-02  55
## 25655                 0                          4.560901e-02  58
## 90193                 0                          3.136640e-03  37
## 89851                 0                          4.613932e-01  63
## 55832                 0                          3.090769e-03  68
## 92547                 0                          5.946478e-01  38
## 68420                 0                          2.962170e-01  31
## 147977                0                          3.507310e-02  51
## 47222                 0                          9.999999e-01  86
## 51070                 0                          4.783975e-02  61
## 119980                0                          3.844421e-01  43
## 135320                0                          8.017355e-01  65
## 74452                 0                          2.739554e-01  53
## 21263                 0                          1.049947e-02  66
## 59695                 0                          1.946403e-01  43
## 141582                0                          3.150413e-02  73
## 11330                 0                          3.294520e-01  64
## 35532                 0                          9.999999e-01  46
## 119022                0                          9.638433e-02  53
## 97269                 0                          0.000000e+00  43
## 12663                 0                          6.295875e-01  27
## 116551                0                          8.266560e-04  66
## 88489                 0                          3.246332e-02  30
## 54519                 0                          9.780439e-01  23
## 37838                 0                          1.146431e-01  52
## 133115                0                          8.571020e-02  48
## 66231                 0                          5.071240e-04  53
## 17198                 0                          5.794071e-01  48
## 88368                 0                          6.371501e-02  60
## 65430                 0                          5.954384e-01  46
## 93417                 0                          7.529806e-02  78
## 59411                 0                          1.122888e-01  62
## 56505                 0                          3.289232e-01  64
## 35914                 0                          1.301383e-02  56
## 43484                 0                          2.372074e-01  59
## 148036                0                          1.752297e-02  68
## 58522                 0                          5.856030e-03  47
## 149331                0                          6.262832e-03  76
## 6798                  0                          5.207523e-01  53
```

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## 83601                0                          0.000000e+00  56
## 105817               0                          0.000000e+00  22
## 144488               0                          1.929921e-01  51
## 11666                0                          9.999999e-01  35
## 96733                0                          2.478590e-03  61
## 117729               0                          5.937338e-01  52
## 127342               0                          9.999999e-01  58
## 78240                0                          1.202662e-02  81
## 54913                0                          1.190263e-01  54
## 65259                0                          7.874803e-03  62
## 47144                0                          8.340830e-01  28
## 90338                0                          1.611678e-01  41
## 66151                0                          6.200896e-02  26
## 128909               0                          1.240382e-03  49
## 27604                0                          2.023899e-01  42
## 19342                0                          2.971259e-03  55
## 147323               0                          0.000000e+00  26
## 74238                0                          3.853975e-02  66
## 109769               0                          9.999999e-01  30
## 146545               0                          7.565026e-02  44
## 120210               0                          2.786564e-01  58
## 93146                0                          2.343695e-01  63
## 28928                0                          0.000000e+00  48
## 52705                0                          1.826545e-02  58
## 47405                0                          2.078893e-03  51
## 93239                0                          5.823785e-01  53
## 29016                0                          9.999999e-01  29
## 33936                0                          2.263255e-01  44
## 65093                0                          4.479800e-02  46
## 128700               0                          6.151096e-01  46
## 59138                0                          3.835386e-01  46
## 57807                0                          0.000000e+00  43
## 117108               0                          5.935677e-01  26
## 77318                0                          1.361423e-01  55
## 128531               0                          1.300512e+00  34
## 75516                0                          5.648320e-02  55
## 38930                0                          9.999999e-01  25
## 61026                0                          7.759876e-02  53
## 142614               0                          9.999999e-01  31
## 20836                0                          9.999999e-01  27
## 103415               0                          9.638518e-01  39
## 87857                0                          0.000000e+00  52
## 4981                 0                          2.845368e-02  58
## 12                   0                          1.879812e-02  51
## 66143                0                          6.921584e-01  41
## 72113                0                          7.343178e-01  36
## 113928               0                          6.212360e-01  53
## 140987               0                          8.867974e-03  57
## 25661                0                          1.825963e-01  63
## 127648               0                          1.124700e-01  43
## 132619               0                          9.999999e-01  38
## 139257               0                          7.627575e-01  70
## 91385                0                          9.318434e-02  45
## 91852                0                          2.757890e-01  47
```

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## 134917                0                          6.099187e-01  30
## 102964                0                          6.067694e-01  42
## 142457                0                          1.474107e-01  32
## 43838                 0                          2.935589e-01  29
## 1644                  0                          1.089310e-02  71
## 129512                0                          3.269005e-01  73
## 100812                0                          3.279679e-01  52
## 112886                0                          1.769491e-01  66
## 88075                 0                          3.631023e-02  50
## 132449                0                          7.851642e-03  77
## 35345                 0                          1.155042e+00  47
## 48207                 0                          0.000000e+00  47
## 60669                 0                          1.692215e-02  59
## 148798                0                          9.019074e-01  53
## 42447                 0                          5.834066e-02  54
## 142065                0                          3.568371e-02  35
## 93241                 0                          5.778632e-02  39
## 114896                0                          6.104303e-02  62
## 55060                 0                          4.702120e-04  76
## 81565                 0                          8.668918e-01  61
## 144526                0                          5.083322e-01  51
## 19585                 0                          1.514805e-01  39
## 133941                0                          1.467696e-01  56
## 68484                 0                          7.967289e-02  73
## 15046                 0                          8.395757e-01  38
## 111201                0                          5.540950e-03  51
## 1578                  0                          3.291521e-01  41
## 58669                 0                          3.830021e-01  54
## 61175                 0                          9.999999e-01  39
## 57363                 0                          2.139065e-01  48
## 71519                 0                          1.092710e-01  65
## 9242                  0                          4.759756e-01  41
## 21116                 0                          9.999999e-01  24
## 51488                 0                          2.504825e-02  56
## 139151                0                          2.312769e-01  26
## 28979                 0                          2.545326e-02  32
## 97856                 0                          5.365114e-01  57
## 101530                0                          4.727673e-01  30
## 19976                 0                          6.252822e-01  34
## 97330                 0                          8.681040e-01  76
## 93205                 0                          7.017595e-01  34
## 57932                 0                          3.209112e-01  61
## 97328                 0                          5.341644e-02  42
## 39911                 0                          4.132874e-02  26
## 59076                 0                          9.740037e-01  54
## 42398                 0                          1.302498e-01  53
## 95233                 0                          9.055497e-01  79
## 142950                0                          1.740283e-03  55
## 127535                0                          0.000000e+00  60
## 135231                0                          7.847470e-02  70
## 45554                 0                          1.025265e-01  46
## 28642                 0                          1.078736e-01  46
## 125461                0                          9.999999e-01  29
## 32223                 0                          1.765197e-02  36
```

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## 40209                0                        9.818182e-01  28
## 102136               0                        5.874804e-01  45
## 109566               0                        4.371304e-02  58
## 86852                0                        1.055304e-02  77
## 15797                0                        2.834613e-01  62
## 104507               0                        3.192859e-01  27
## 115158               0                        8.914327e-03  38
## 141503               0                        3.465151e-01  33
## 134225               0                        8.963942e-01  68
## 119694               0                        7.942058e-01  31
## 49979                0                        2.303885e-01  53
## 133552               0                        7.470556e-01  46
## 5798                 0                        9.999999e-01  39
## 13297                0                        1.097863e-01  79
## 63427                0                        2.102111e-01  53
## 11470                0                        6.700471e-01  59
## 58487                0                        0.000000e+00  69
## 49058                0                        3.146654e-01  62
## 87962                0                        7.499349e-01  43
## 70417                0                        1.456482e-02  67
## 107185               0                        6.276774e-01  52
## 76545                0                        1.420786e-01  49
## 111091               0                        1.667859e-02  71
## 106028               0                        5.712473e-02  29
## 11609                0                        1.395002e-01  38
## 39488                0                        0.000000e+00  65
## 50098                0                        4.314821e-01  56
## 147983               0                        0.000000e+00  29
## 90362                0                        8.828104e-01  55
## 3231                 0                        0.000000e+00  58
## 1189                 0                        9.927252e-02  58
## 33890                0                        9.290372e-01  34
## 60155                0                        1.921616e-01  60
## 88455                0                        3.486823e-02  46
## 48171                0                        2.828541e-01  49
## 68893                0                        5.908409e-01  44
## 23175                0                        6.418264e-02  34
## 19796                0                        1.429675e-02  44
## 15617                0                        0.000000e+00  68
## 85175                0                        1.005518e-01  46
## 52343                0                        9.999999e-01  40
## 117466               0                        7.167435e-01  60
## 118436               0                        2.619000e+03  66
## 145367               0                        9.051843e-01  57
## 35028                0                        9.999999e-01  36
## 2065                 0                        2.919490e-04  60
## 22907                0                        0.000000e+00  62
## 135632               0                        1.799581e-02  52
## 129077               0                        2.876410e-01  33
## 117604               0                        5.313527e-02  38
## 116800               0                        6.449209e-01  41
## 79703                0                        1.001329e+00  51
## 56924                0                        2.991718e-02  47
## 127586               0                        3.606320e-01  38
```

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## 33085                0                          3.859179e-01  62
## 77936                0                          5.235738e-01  36
## 87251                0                          1.797943e-03  60
## 65761                0                          2.223555e-01  31
## 131228               0                          6.093045e-01  54
## 129739               0                          8.068780e-03  54
## 91612                0                          7.321786e-03  58
## 60983                0                          4.844223e-01  41
## 9697                 0                          8.721851e-02  51
## 70325                0                          4.997785e-02  42
## 124532               0                          0.000000e+00  33
## 94657                0                          1.466664e-01  55
## 76824                0                          3.840990e-01  33
## 146825               0                          6.782019e-03  28
## 112116               0                          1.991204e-03  73
## 95058                0                          1.604920e-02  29
## 77608                0                          0.000000e+00  25
## 136239               0                          3.925062e-02  39
## 112177               0                          5.274814e-01  37
## 53593                0                          3.731866e-01  40
## 4159                 0                          3.897433e-01  28
## 143801               0                          2.486510e-01  89
## 7052                 0                          3.185196e-02  56
## 72924                0                          2.131259e-01  35
## 6953                 0                          1.483234e-01  38
## 70822                0                          1.882592e-01  29
## 26050                0                          4.749239e-01  64
## 57634                0                          2.417181e-01  44
## 139590               0                          1.083406e-01  73
## 26927                0                          9.999999e-01  31
## 26454                0                          2.012248e-01  70
## 63872                0                          0.000000e+00  69
## 21624                0                          6.677404e-02  69
## 147134               0                          1.198795e-02  45
## 1193                 0                          9.636146e-01  46
## 115554               0                          0.000000e+00  64
## 46066                0                          9.999999e-01  48
## 22173                0                          4.863674e-02  64
## 118992               0                          1.126669e-02  63
## 71312                0                          7.794051e-01  28
## 45415                0                          9.927931e-01  45
## 6641                 0                          1.920352e-02  66
## 65844                0                          2.911835e-02  48
## 64989                0                          8.645409e-01  32
## 33178                0                          1.507466e-01  76
## 126749               0                          2.651464e-01  47
## 93571                0                          2.415751e-01  40
## 77960                0                          4.237589e-01  44
## 103102               0                          7.182350e-02  43
## 131660               0                          7.030270e-01  33
## 66110                0                          0.000000e+00  68
## 834                  0                          2.352252e-01  37
## 95680                0                          1.345216e-01  67
## 14166                0                          7.873218e-03  85
```

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## 29391                0                          3.758920e-01  69
## 132622               0                          1.178550e-03  60
## 126311               0                          1.759824e-01  32
## 846                  0                          8.353115e-01  31
## 11818                0                          4.122206e-01  35
## 93257                0                          3.509901e-01  63
## 105592               0                          5.717141e-01  34
## 83974                0                          9.999999e-01  64
## 56022                0                          3.132238e-02  72
## 35037                0                          3.578077e-01  60
## 141732               0                          6.242380e-01  62
## 112497               0                          2.314226e-02  73
## 125466               0                          2.856828e-02  71
## 107982               0                          6.333240e-01  39
## 119466               0                          0.000000e+00  45
## 33668                0                          7.810331e-02  57
## 79940                0                          4.338772e-01  62
## 37973                0                          3.259109e-02  70
## 91621                0                          1.942975e-01  61
## 125984               0                          8.383659e-01  42
## 9022                 0                          9.999999e-01  35
## 119003               0                          2.286988e-02  43
## 102285               0                          1.388000e-01  48
## 104498               0                          9.999999e-01  54
## 113695               0                          8.458201e-01  44
## 60874                0                          1.326680e-04  61
## 140196               0                          9.999999e-01  32
## 125353               0                          4.302815e-02  64
## 68487                0                          3.976576e-02  47
## 21502                0                          9.244151e-01  38
## 6791                 0                          7.353162e-01  23
## 109299               0                          6.316538e-03  44
## 60088                0                          9.999999e-01  85
## 102542               0                          2.806964e-02  33
## 18240                0                          6.783951e-02  72
## 34310                0                          5.537093e-02  59
## 119604               0                          5.999833e-02  30
## 7501                 0                          5.722853e-03  86
## 64738                0                          5.024738e-01  34
## 91227                0                          2.452610e-01  31
## 124306               0                          8.420108e-02  69
## 148273               0                          3.786744e-02  57
## 22791                0                          9.672217e-01  54
## 65848                0                          9.999999e-01  24
## 115704               0                          5.534951e-01  44
## 16883                0                          0.000000e+00  38
## 4049                 0                          4.151215e-03  48
## 131864               0                          7.709615e-02  78
## 26530                0                          9.222745e-01  50
## 60443                0                          1.574880e-01  41
## 47737                0                          5.360334e-03  60
## 23459                0                          1.718208e-02  68
## 24560                0                          5.845104e-01  55
## 21864                0                          3.170091e-01  29
```

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## 33009                0                          7.908955e-01  33
## 95465                0                          2.887675e-02  47
## 20203                0                          9.742301e-01  32
## 83672                0                          1.250937e-01  40
## 131599               0                          5.820453e-01  34
## 62371                0                          2.311579e-02  30
## 30681                0                          4.538721e-01  49
## 101776               0                          0.000000e+00  66
## 50865                0                          9.999999e-01  27
## 32903                0                          0.000000e+00  64
## 48351                0                          4.947212e-01  41
## 18296                0                          3.857692e-01  33
## 45317                0                          9.999999e-01  43
## 3100                 0                          2.212699e-02  49
## 70286                0                          9.134088e-01  45
## 23292                0                          4.771809e-02  60
## 135377               0                          1.458677e-01  49
## 97197                0                          1.578947e-01  39
## 38011                0                          9.999999e-01  53
## 69672                0                          1.409800e-01  43
## 41640                0                          2.238567e-01  84
## 82122                0                          2.083258e-02  62
## 111882               0                          1.769122e-01  44
## 116942               0                          5.642359e-01  58
## 92516                0                          8.759124e-02  43
## 136375               0                          9.076718e-02  65
## 130710               0                          7.874320e-02  46
## 7818                 0                          0.000000e+00  41
## 67260                0                          2.493410e-01  38
## 65187                0                          4.817126e-02  37
## 29611                0                          4.715740e-03  28
## 7317                 0                          6.899628e-02  41
## 76909                0                          9.999999e-01  56
## 138551               0                          2.129701e-01  48
## 136883               0                          2.148933e-01  42
## 110625               0                          2.811300e-02  80
## 37083                0                          2.922586e-02  66
## 44500                0                          5.509559e-02  61
## 113037               0                          2.411395e-02  49
## 115304               0                          1.064962e-01  53
## 47631                0                          9.729802e-01  56
## 129045               0                          1.853510e-02  52
## 130885               0                          2.662150e-01  32
## 80309                0                          2.035593e-01  27
## 8738                 0                          6.985502e-01  26
## 4956                 0                          4.765762e-01  40
## 37082                0                          5.711732e-01  44
## 130340               0                          0.000000e+00  46
## 84057                0                          3.726808e-01  57
## 143839               0                          6.329178e-01  55
## 5190                 0                          3.835095e-01  49
## 77714                0                          9.847328e-01  35
## 104484               0                          2.123938e-01  48
## 4342                 0                          1.764355e-01  48
```

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## 17776                0                          1.446570e-02  57
## 148097               0                          1.964629e-02  27
## 18830                0                          8.465588e-01  45
## 137807               0                          0.000000e+00  65
## 144553               0                          2.808833e-01  25
## 17134                0                          0.000000e+00  45
## 6512                 0                          1.703739e-01  63
## 132109               0                          5.512855e-01  52
## 4743                 0                          8.943094e-01  50
## 134433               0                          4.346687e-02  45
## 64374                0                          2.742333e-01  49
## 60986                0                          2.936443e-01  43
## 53098                0                          2.968353e-01  40
## 128567               0                          3.569315e-02  34
## 105269               0                          4.808136e-01  58
## 84920                0                          2.678775e-01  44
## 115408               0                          0.000000e+00  76
## 60829                0                          8.735722e-02  61
## 49606                0                          0.000000e+00  65
## 69296                0                          4.819518e-02  73
## 77184                0                          1.462395e-01  46
## 39947                0                          6.216882e-03  63
## 145528               0                          4.031126e-01  61
## 85198                0                          1.263864e-01  82
## 141776               0                          4.470457e-03  57
## 105711               0                          7.784279e-02  84
## 90582                0                          5.095426e-01  42
## 36327                0                          3.038485e-02  47
## 116673               0                          9.924357e-01  51
## 124420               0                          8.379534e-01  35
## 39920                0                          2.339883e-02  59
## 86814                0                          3.554708e-02  69
## 21438                0                          9.999999e-01  28
## 127993               0                          5.338923e-02  62
## 15914                0                          2.639868e-02  56
## 98861                0                          7.651980e-02  63
## 5755                 0                          4.019158e-01  56
## 70925                0                          6.905238e-01  25
## 31220                0                          1.428612e-01  53
## 25290                0                          1.453563e-02  73
## 136172               0                          1.673985e-01  46
## 105053               0                          5.603251e-02  37
## 67496                0                          6.291976e-01  41
## 123827               0                          1.425306e-01  55
## 123331               0                          4.036119e-02  89
## 116894               0                          3.411285e-02  62
## 143781               0                          5.701477e-01  64
## 148700               0                          1.666556e-03  39
## 9539                 0                          1.172953e-01  57
## 15262                0                          1.779802e-01  40
## 126019               0                          8.782435e-02  38
## 81218                0                          4.119529e-01  67
## 72453                0                          5.102876e-01  58
## 148082               0                          1.472460e-02  24
```

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## 33173                0                        3.108635e-01  56
## 4042                 0                        5.902274e-02  39
## 82548                0                        7.702691e-01  59
## 105800               0                        3.381716e-02  66
## 3321                 0                        0.000000e+00  67
## 145674               0                        9.972312e-01  46
## 23764                0                        5.414549e-01  52
## 146122               0                        1.991023e-02  43
## 132066               0                        1.090174e-01  30
## 139291               0                        4.011448e-03  44
## 1310                 0                        4.474650e-01  59
## 61369                0                        1.870441e-03  62
## 148578               0                        6.205367e-03  63
## 110001               0                        9.999999e-01  38
## 126753               0                        8.936376e-02  64
## 117679               0                        3.030357e-01  57
## 13460                0                        0.000000e+00  43
## 109458               0                        9.999999e-01  63
## 71053                0                        5.064013e-01  39
## 148828               0                        0.000000e+00  51
## 27276                0                        1.320487e-02  66
## 149607               0                        0.000000e+00  40
## 112667               0                        2.832429e-02  77
## 83470                0                        7.296255e-01  35
## 128353               0                        3.279022e-01  30
## 132913               0                        3.209679e-02  65
## 59379                0                        5.309429e-02  34
## 102304               0                        4.563437e-01  32
## 108155               0                        2.305292e-02  68
## 120609               0                        7.068298e-01  61
## 42028                0                        5.099362e-01  38
## 23350                0                        2.908721e-01  28
## 79266                0                        1.784713e-01  59
## 110614               0                        4.951241e-01  25
## 141404               0                        3.643452e-01  32
## 78436                0                        1.427888e-01  76
## 4675                 0                        0.000000e+00  22
## 118006               0                        3.455149e-01  42
## 122460               0                        4.622829e-01  37
## 111718               0                        2.194042e-01  53
## 146460               0                        7.996431e-01  37
## 109892               0                        6.918341e-02  30
## 49807                0                        0.000000e+00  46
## 138374               0                        3.766903e-02  50
## 133689               0                        5.018124e-01  78
## 74004                0                        3.165504e-01  34
## 134406               0                        3.051300e-01  45
## 52891                0                        7.249910e-01  44
## 104289               0                        4.392499e-01  37
## 72307                0                        9.999999e-01  43
## 74634                0                        2.186774e-02  52
## 88579                0                        1.222472e-01  59
## 52927                0                        9.462523e-03  61
## 116556               0                        4.269740e-02  65
```

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## 140907                0                          1.319028e-02  45
## 50239                 0                          8.477729e-01  41
## 43280                 0                          2.329592e-01  62
## 70179                 0                          9.089392e-03  55
## 147256                0                          0.000000e+00  80
## 6969                  0                          9.010549e-01  51
## 4969                  0                          4.476086e-02  51
## 20633                 0                          9.999999e-01  43
## 97804                 0                          5.629282e-02  70
## 54014                 0                          2.378897e-02  56
## 103045                0                          1.206712e-01  42
## 98099                 0                          9.780019e-01  28
## 68133                 0                          4.038618e-02  53
## 28118                 0                          2.769889e-01  33
## 89627                 0                          2.039898e-02  46
## 12376                 0                          8.167456e-01  49
## 119332                0                          3.233981e-01  36
## 120878                0                          1.259297e-01  75
## 56617                 0                          8.894259e-01  37
## 99410                 0                          6.928577e-03  53
## 140461                0                          1.658193e-01  57
## 31688                 0                          2.547895e-01  47
## 53363                 0                          7.249910e-04  81
## 130630                0                          1.017812e-01  35
## 146435                0                          6.497166e-03  67
## 44908                 0                          9.999999e-01  51
## 24256                 0                          4.843592e-01  76
## 83079                 0                          1.055263e-01  64
## 106497                0                          6.315100e-02  59
## 37215                 0                          2.109461e-01  57
## 141842                0                          5.281284e-01  48
## 100110                0                          2.110986e-01  40
## 29569                 0                          2.062238e-01  37
## 147164                0                          2.598420e-01  34
## 79994                 0                          9.911757e-01  37
## 82009                 0                          2.393380e-01  71
## 3693                  0                          7.289199e-02  69
## 75612                 0                          3.451410e-01  34
## 85182                 0                          2.920044e-01  46
## 141648                0                          1.069465e-01  43
## 35845                 0                          2.085507e-01  44
## 26730                 0                          2.999800e-02  77
## 36780                 0                          6.154132e-01  37
## 146713                0                          3.541076e-01  29
## 110226                0                          8.472357e-01  32
## 39957                 0                          3.685103e-01  41
## 133343                0                          2.758455e-01  38
## 24049                 0                          0.000000e+00  64
## 74705                 0                          1.362577e-02  53
## 22865                 0                          1.014981e-01  59
## 142911                0                          9.633943e-01  25
## 30960                 0                          9.999999e-01  44
## 98929                 0                          0.000000e+00  48
## 59952                 0                          7.888649e-01  33
```

```
## 33858                0                          3.331113e-03  36
## 55176                0                          1.260578e-01  64
## 71778                0                          1.054384e+00  35
## 136957               0                          0.000000e+00  82
## 102852               0                          7.142451e-01  59
## 4487                 0                          2.785389e-01  55
## 104254               0                          8.223850e-02  66
## 144067               0                          7.811088e-02  30
## 95158                0                          6.582498e-01  49
## 94204                0                          5.040680e-02  31
## 128360               0                          5.200988e-01  56
## 143161               0                          5.689935e-01  47
## 140148               0                          7.974852e-01  44
## 16665                0                          4.620013e-01  61
## 80011                0                          1.999901e-02  52
## 103140               0                          5.871301e-01  67
## 100846               0                          1.882697e-02  50
## 59355                0                          5.091808e-02  43
## 21448                0                          6.997944e-02  34
## 106231               0                          9.253396e-01  53
## 4638                 0                          6.454903e-01  51
## 22871                0                          2.820293e-02  49
## 29363                0                          1.321670e-01  79
## 44615                0                          5.258498e-01  45
## 91147                0                          2.665197e-02  68
## 94438                0                          5.358183e-02  28
## 23468                0                          7.740144e-01  35
## 34575                0                          1.108438e-02  79
## 28256                0                          1.536612e-02  79
## 11571                0                          3.082456e-03  36
## 68761                0                          1.458294e-01  64
## 4228                 0                          4.845781e-03  39
## 33519                0                          9.999999e-01  55
## 36434                0                          1.767343e-01  65
## 109520               0                          9.183091e-01  53
## 113874               0                          3.738633e-01  48
## 31700                0                          0.000000e+00  38
## 109269               0                          1.580218e-01  42
## 24586                0                          1.369515e-02  77
## 46357                0                          1.009481e+00  81
## 54182                0                          5.700208e-02  45
## 96646                0                          7.112385e-02  49
## 88142                0                          7.730657e-02  48
## 131182               0                          3.154676e-01  47
## 4751                 0                          5.603312e-01  32
## 134762               0                          2.378129e-01  37
## 96310                0                          1.783709e-01  76
## 49511                0                          6.162008e-02  42
## 75344                0                          1.678204e-01  72
## 34344                0                          1.001818e+00  32
## 128539               0                          5.248930e-02  31
## 139877               0                          9.632739e-01  49
## 105669               0                          1.689856e-02  61
## 89179                0                          7.704690e-02  50
```

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## 97191                0                        1.420069e-01  38
## 67719                0                        4.698819e-01  59
## 84613                0                        2.335029e-01  44
## 8149                 0                        1.043979e-01  50
## 98827                0                        6.620125e-01  64
## 66428                0                        1.022666e+00  40
## 65009                0                        3.036565e-02  84
## 13203                0                        9.188022e-03  56
## 145843               0                        6.338732e-02  72
## 21352                0                        9.913894e-01  61
## 123764               0                        5.622536e-02  43
## 64447                0                        2.285388e-03  30
## 58225                0                        5.416054e-01  26
## 143139               0                        1.251667e-01  54
## 137605               0                        8.550954e-01  31
## 45472                0                        9.999999e-01  33
## 49340                0                        2.970771e-02  47
## 123529               0                        4.700699e-01  36
## 39498                0                        3.684133e-03  36
## 102385               0                        3.826720e-02  58
## 70505                0                        7.579605e-02  50
## 105778               0                        1.138798e-01  37
## 113885               0                        8.390043e-01  62
## 149846               0                        1.061130e-01  43
## 70529                0                        0.000000e+00  64
## 118675               0                        0.000000e+00  88
## 63538                0                        3.833768e-02  63
## 61932                0                        9.999999e-01  36
## 30402                0                        4.794490e-02  68
## 72203                0                        7.305851e-01  62
## 119109               0                        0.000000e+00  24
## 53034                0                        4.581806e-01  30
## 132212               0                        9.852130e-01  60
## 65409                0                        2.026721e-03  62
## 55880                0                        6.992673e-03  50
## 62507                0                        1.435660e-01  59
## 34                   0                        1.868686e-01  57
## 144475               0                        4.257795e-01  33
## 4206                 0                        9.641821e-02  49
## 92536                0                        4.351718e-03  31
## 118907               0                        7.588505e-01  33
## 51131                0                        1.044811e+00  32
## 136640               0                        9.999999e-01  48
## 32419                0                        1.212077e-01  50
## 35880                0                        8.554011e-03  42
## 25672                0                        0.000000e+00  44
## 72205                0                        9.358026e-01  58
## 125889               0                        0.000000e+00  32
## 138165               0                        6.843854e-01  27
## 30062                0                        2.651668e-01  34
## 52542                0                        6.454121e-01  26
## 147021               0                        2.849560e-01  33
## 128679               0                        3.617018e-01  54
## 103932               0                        7.923073e-02  61
```

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## 69732                0                        1.442328e+00  40
## 135709               0                        3.198097e-01  51
## 119263               0                        8.052398e-01  43
## 42544                0                        6.211794e-01  46
## 98926                0                        6.545517e-02  70
## 29637                0                        9.313692e-01  40
## 149288               0                        6.806886e-01  38
## 125390               0                        1.223562e-01  72
## 109802               0                        2.326304e-01  45
## 94050                0                        8.154253e-01  54
## 25055                0                        2.147393e-01  37
## 46653                0                        7.162271e-03  45
## 58057                0                        2.054527e-02  36
## 23021                0                        6.652283e-01  70
## 32782                0                        9.437440e-01  60
## 120190               0                        8.397388e-01  31
## 4833                 0                        1.351802e-02  60
## 147817               0                        1.879379e-02  50
## 5337                 0                        8.126438e-01  55
## 4987                 0                        2.326339e-01  68
## 32329                0                        9.999999e-01  29
## 137866               0                        0.000000e+00  58
## 70662                0                        7.878510e-01  36
## 124970               0                        9.999999e-01  65
## 91782                0                        8.233867e-03  51
## 101110               0                        8.726086e-02  62
## 42712                0                        2.632415e-01  76
## 32723                0                        2.967551e-02  30
## 54193                0                        6.426437e-02  32
## 23565                0                        2.827523e-02  74
## 109798               0                        4.457386e-01  49
## 57390                0                        0.000000e+00  62
## 118662               0                        2.652841e-01  51
## 38005                0                        1.573753e-01  38
## 18276                0                        1.037122e-01  47
## 92495                0                        5.872064e-01  23
## 115742               0                        8.310517e-01  68
## 58702                0                        2.698151e-02  63
## 71052                0                        2.071124e-01  48
## 113878               0                        5.407932e-02  64
## 126754               0                        4.885950e-01  35
## 43124                0                        7.394261e-01  62
## 11547                0                        1.754128e-01  32
## 106784               0                        5.299089e-01  46
## 95928                0                        9.998919e-01  41
## 39049                0                        2.272500e-01  54
## 144540               0                        5.122805e-01  41
## 34807                0                        5.864490e-01  61
## 53893                0                        2.437983e-03  72
## 88068                0                        1.226105e-02  48
## 93163                0                        2.422984e-02  61
## 125049               0                        4.733814e-01  39
## 86182                0                        1.359734e-01  66
## 117777               0                        5.611578e-03  73
```

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## 124527          0                    8.239203e-01  57
## 136234          0                    4.496268e-02  51
## 8587            0                    9.962655e-02  29
## 25124           0                    9.999999e-01  32
## 26503           0                    0.000000e+00  34
## 61975           0                    1.117715e-01  53
## 6473            0                    5.046498e-02  67
## 89696           0                    9.540918e-01  30
## 86965           0                    6.260222e-01  29
## 59928           0                    7.358845e-01  47
## 39104           0                    4.344966e-02  69
## 121103          0                    9.999999e-01  43
## 63423           0                    0.000000e+00  30
## 114319          0                    9.999999e-01  32
## 59536           0                    2.045061e-01  45
## 119165          0                    0.000000e+00  55
## 113614          0                    9.520890e-03  62
## 68521           0                    6.297923e-01  40
## 29138           0                    6.161857e-01  42
## 41000           0                    2.290574e-01  27
## 94395           0                    1.739835e-01  64
## 66349           0                    8.129636e-01  42
## 2167            0                    7.149725e-01  41
## 109427          0                    1.442556e-01  48
## 21380           0                    8.473157e-01  57
## 16163           0                    5.433003e-01  86
## 46278           0                    6.538692e-01  45
## 60921           0                    6.175896e-02  41
## 13632           0                    5.703918e-02  46
## 56072           0                    8.865635e-02  33
## 9266            0                    9.295228e-01  36
## 101898          0                    6.120172e-01  34
## 1440            0                    2.329767e-02  30
## 55867           0                    2.921647e-02  66
## 144910          0                    4.430008e-02  66
## 111878          0                    5.299574e-01  73
## 138660          0                    2.339256e-02  73
## 18851           0                    8.756028e-02  29
## 34079           0                    1.607668e-02  43
## 100971          0                    2.402441e-03  54
## 133922          0                    5.328946e-02  48
## 59078           0                    2.792959e-01  53
## 4549            0                    4.585663e-02  47
## 82507           0                    9.999999e-01  26
## 147568          0                    3.094483e-01  84
## 137893          0                    0.000000e+00  57
## 41832           0                    1.803507e-02  56
## 3905            0                    5.154992e-01  49
## 114591          0                    0.000000e+00  86
## 81840           0                    5.516434e-02  69
## 67826           0                    3.804992e-03  53
## 141545          0                    7.941723e-01  33
## 92404           0                    3.172345e-02  35
## 144391          0                    3.293671e-01  55
```

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## 84929                0                        7.107716e-02  58
## 119701               0                        3.131045e-02  73
## 106570               0                        6.375915e-01  48
## 91857                0                        0.000000e+00  40
## 65141                0                        2.655570e-02  39
## 133765               0                        9.999999e-01  40
## 142458               0                        4.531612e-02  34
## 120950               0                        1.010598e+00  31
## 29187                0                        1.088141e-01  52
## 4912                 0                        5.878412e-01  33
## 55167                0                        5.058127e-01  58
## 42917                0                        4.645647e-02  30
## 63349                0                        5.263980e-02  41
## 71575                0                        1.995049e-02  48
## 43283                0                        5.955404e-01  33
## 8910                 0                        6.551540e-02  53
## 134880               0                        3.779186e-01  31
## 126422               0                        9.601594e-01  30
## 110320               0                        0.000000e+00  34
## 77308                0                        6.066517e-02  29
## 3228                 0                        9.999999e-01  57
## 128488               0                        9.432704e-01  58
## 53638                0                        9.999999e-01  47
## 42267                0                        9.999999e-01  36
## 19515                0                        2.166563e-02  47
## 20637                0                        2.157476e-02  54
## 91507                0                        3.241723e-01  62
## 101944               0                        1.298310e-01  64
## 33720                0                        2.669148e-01  47
## 65466                0                        5.718856e-02  67
## 7997                 0                        9.883642e-01  40
## 93255                0                        0.000000e+00  46
## 117744               0                        9.999999e-01  52
## 97971                0                        9.974264e-02  44
## 123404               0                        2.102105e-01  35
## 94560                0                        4.486677e-01  33
## 32090                0                        1.187506e-01  41
## 54778                0                        5.476701e-01  56
## 145601               0                        2.881800e-01  37
## 14458                0                        3.277715e-01  62
## 122412               0                        5.041773e-03  49
## 113496               0                        9.664570e-02  43
## 11393                0                        5.064153e-01  60
## 135687               0                        1.835096e-01  47
## 55407                0                        2.466219e-02  61
## 57319                0                        1.336496e-02  46
## 72073                0                        5.079677e-01  46
## 70581                0                        7.463630e-01  43
## 9563                 0                        6.291532e-01  67
## 35820                0                        1.647830e-01  49
## 148832               0                        7.777490e-04  86
## 55726                0                        7.356487e-01  35
## 82258                0                        9.167579e-01  77
## 21527                0                        1.034644e+00  25
```

```
## 49303                0                          4.237727e-01  55
## 113896               0                          9.999999e-01  28
## 11872                0                          2.169688e-01  44
## 18650                0                          8.503107e-01  34
## 65803                0                          4.182154e-01  46
## 11625                0                          1.664246e-01  55
## 47567                0                          5.795387e-02  52
## 120346               0                          9.999999e-01  46
## 9359                 0                          3.471244e-02  60
## 55629                0                          4.932311e-03  86
## 86043                0                          3.543068e-03  65
## 122456               0                          1.284525e-01  62
## 5308                 0                          2.710837e-02  72
## 93155                0                          0.000000e+00  55
## 27202                0                          0.000000e+00  66
## 119765               0                          0.000000e+00  24
## 91144                0                          7.191390e-01  29
## 113100               0                          2.259910e-02  52
## 58313                0                          5.076080e-01  28
## 93243                0                          3.641674e-02  46
## 88998                0                          9.444202e-01  60
## 138099               0                          7.224639e-02  54
## 120354               0                          3.723711e-02  80
## 100327               0                          8.657614e-01  46
## 70513                0                          2.499500e-01  66
## 66494                0                          1.161765e-01  69
## 19564                0                          5.945346e-02  63
## 73785                0                          9.999999e-01  26
## 146191               0                          5.006604e-01  41
## 74675                0                          1.309211e-02  67
## 37351                0                          9.807526e-01  50
## 98382                0                          8.109189e-02  44
## 79429                0                          2.763804e-01  68
## 136697               0                          1.145257e-01  63
## 21196                0                          3.647700e-01  51
## 134084               0                          2.478573e-01  25
## 139861               0                          4.128679e-01  60
## 75698                0                          7.193540e-02  53
## 5261                 0                          8.948097e-01  53
## 147384               0                          2.900387e-02  69
## 84556                0                          2.910596e-02  78
## 99830                0                          1.141572e+00  35
## 56685                0                          2.214889e-02  62
## 18066                0                          4.578612e-02  72
## 123072               0                          1.015100e+04  35
## 69949                0                          1.484552e-03  80
## 41169                0                          7.774613e-01  47
## 43808                0                          3.754498e-01  38
## 141100               0                          9.151836e-01  54
## 80746                0                          6.044322e-01  52
## 9566                 0                          7.763847e-01  28
## 143870               0                          1.289850e-01  54
## 120085               0                          8.409303e-01  33
## 20029                0                          1.698097e-02  46
```

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## 69356                0                          3.402112e-02  46
## 49365                0                          1.495754e-02  60
## 982                  0                          7.491336e-01  50
## 127793               0                          0.000000e+00  69
## 125728               0                          2.871500e-03  46
## 68947                0                          6.172790e-01  49
## 95741                0                          2.755364e-01  31
## 77253                0                          8.985968e-01  43
## 133375               0                          1.012899e-01  45
## 80930                0                          7.527808e-03  64
## 111671               0                          2.371246e-02  65
## 104733               0                          4.027331e-02  44
## 7585                 0                          3.802862e-02  55
## 129636               0                          1.745830e-02  36
## 136221               0                          2.276406e-01  39
## 19338                0                          4.539136e-03  86
## 6316                 0                          0.000000e+00  76
## 80651                0                          0.000000e+00  40
## 92565                0                          5.662553e-01  59
## 13870                0                          4.399780e-02  82
## 135748               0                          7.899624e-02  45
## 52342                0                          1.933753e-02  60
## 36162                0                          2.141956e-01  43
## 118128               0                          4.100454e-02  50
## 149006               0                          1.539909e-01  58
## 144504               0                          8.064833e-02  60
## 148240               0                          6.978440e-02  31
## 137523               0                          7.929093e-03  51
## 31155                0                          1.359572e-02  35
## 28314                0                          1.936128e-01  35
## 144595               0                          2.268358e-02  51
## 95660                0                          9.208158e-01  26
## 19616                0                          1.629938e-01  61
## 14435                0                          1.839423e-02  52
## 102710               0                          9.999999e-01  29
## 42424                0                          5.403627e-01  61
## 113283               0                          3.621576e-01  63
## 15831                0                          1.601757e-02  64
## 123663               0                          6.502702e-01  59
## 66522                0                          1.204267e-01  78
## 5471                 0                          2.790301e-01  33
## 110176               0                          1.317977e-02  40
## 106788               0                          3.591012e-02  49
## 62374                0                          5.999489e-01  57
## 15124                0                          4.844243e-01  51
## 69062                0                          6.749478e-01  46
## 139527               0                          9.765152e-01  70
## 42967                0                          4.885132e-02  47
## 126758               0                          2.707859e-02  62
## 24184                0                          6.829402e-01  38
## 11785                0                          4.065371e-01  54
## 88117                0                          4.993084e-03  75
## 139886               0                          3.019758e-01  28
## 70696                0                          3.020658e-01  51
```

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## 94131                0                        1.167243e-01  76
## 138527               0                        8.755111e-01  26
## 65576                0                        1.536607e-03  62
## 25561                0                        1.927892e-01  39
## 69066                0                        3.538732e-01  26
## 117879               0                        4.046035e-01  45
## 88754                0                        9.835017e-01  38
## 22908                0                        4.341660e-02  51
## 88027                0                        4.394686e-01  43
## 2483                 0                        6.779635e-01  65
## 75398                0                        8.923516e-01  72
## 103580               0                        3.453800e-01  46
## 129065               0                        4.707416e-01  44
## 12318                0                        9.932007e-01  40
## 38773                0                        4.872654e-01  64
## 128153               0                        9.999999e-01  47
## 9487                 0                        8.945132e-01  47
## 120722               0                        4.879791e-02  61
## 82550                0                        6.026838e-01  73
## 128008               0                        5.014306e-02  60
## 118580               0                        1.808926e-01  65
## 101905               0                        2.213183e-01  36
## 124922               0                        3.058265e-01  75
## 80219                0                        0.000000e+00  53
## 95824                0                        0.000000e+00  44
## 17216                0                        9.846379e-01  43
## 12847                0                        4.996693e-01  46
## 145962               0                        4.303794e-02  62
## 42106                0                        1.574961e-02  67
## 116724               0                        9.999999e-01  80
## 123626               0                        2.693154e-02  80
## 21114                0                        2.091558e-03  79
## 32503                0                        2.815075e-01  31
## 94660                0                        3.446437e-02  40
## 20624                0                        6.638234e-02  61
## 87047                0                        6.108030e-01  48
## 72542                0                        3.745714e-02  54
## 88607                0                        1.112721e-01  43
## 33979                0                        9.999999e-01  59
## 124037               0                        4.269568e-01  70
## 130146               0                        9.999999e-01  55
## 25215                0                        9.999999e-01  39
## 126115               0                        1.970487e-01  87
## 106452               0                        8.195906e-03  75
## 147212               0                        5.947127e-01  66
## 32338                0                        9.999999e-01  54
## 10842                0                        3.627904e-01  48
## 121233               0                        4.684450e-04  41
## 35609                0                        7.559622e-02  42
## 17328                0                        2.539721e-01  43
## 53581                0                        9.999999e-01  47
## 9461                 0                        4.868823e-01  36
## 14827                0                        4.712477e-02  33
## 56097                0                        0.000000e+00  73
```

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## 101478                0                          2.956747e-02  78
## 34015                 0                          2.278140e-02  62
## 119081                0                          9.613407e-01  31
## 24602                 0                          6.757451e-01  33
## 21542                 0                          6.247578e-02  32
## 68423                 0                          6.982737e-02  69
## 110760                0                          6.418232e-01  50
## 132053                0                          6.587590e-02  35
## 145630                0                          1.235890e-03  52
## 110125                0                          1.518949e-03  49
## 93950                 0                          5.102685e-02  76
## 54179                 0                          0.000000e+00  41
## 41448                 0                          5.300399e-02  45
## 73758                 0                          3.702636e-01  45
## 84675                 0                          8.740630e-01  39
## 125266                0                          9.623230e-03  53
## 89304                 0                          2.917427e-02  37
## 74658                 0                          2.148926e-01  30
## 41541                 0                          0.000000e+00  36
## 12030                 0                          9.542988e-01  71
## 95655                 0                          1.697742e-01  65
## 5515                  0                          1.867626e-01  44
## 62966                 0                          5.970149e-02  61
## 59828                 0                          9.688552e-02  51
## 67486                 0                          8.143983e-02  40
## 127995                0                          6.466451e-02  78
## 115338                0                          2.131837e-03  64
## 99548                 0                          0.000000e+00  55
## 119355                0                          3.646882e-01  83
## 41098                 0                          3.356088e-03  49
## 100647                0                          3.118812e-02  64
## 101883                0                          5.235850e-01  38
## 149692                0                          3.418730e-04  51
## 76946                 0                          2.466584e-03  48
## 79117                 0                          6.422640e-02  57
## 17417                 0                          5.749860e-04  49
## 32039                 0                          1.909588e-01  35
## 33703                 0                          7.390820e-02  45
## 73591                 0                          9.999999e-01  37
## 113613                0                          7.091845e-01  57
## 88663                 0                          3.203004e-02  70
## 52158                 0                          9.999999e-01  47
## 90015                 0                          1.025858e-02  89
## 143379                0                          1.196560e-04  51
## 48326                 0                          0.000000e+00  45
## 81175                 0                          1.139065e-02  67
## 131777                0                          9.439200e-02  24
## 128891                0                          1.007099e+00  38
## 140280                0                          1.609037e-01  39
## 84144                 0                          6.435990e-03  67
## 38160                 0                          8.690127e-02  75
## 116406                0                          3.048484e-01  53
## 52017                 0                          1.217782e+00  56
## 54999                 0                          3.531711e-02  44
```

```
## 52947          0                    9.702959e-01  59
## 85255          0                    0.000000e+00  44
## 137183         0                    5.085289e-02  48
## 72244          0                    8.963950e-01  30
## 145412         0                    5.833577e-02  34
## 2489           0                    4.098893e-01  38
## 10184          0                    4.421246e-01  58
## 147455         0                    2.915181e-01  65
## 14273          0                    9.325105e-01  38
## 58392          0                    1.944516e-02  75
## 37759          0                    3.389618e-01  52
## 62261          0                    9.221557e-01  22
## 125487         0                    2.250192e-01  37
## 131192         0                    1.335926e-01  33
## 138055         0                    4.267195e-02  58
## 142384         0                    2.415146e-02  80
## 135940         0                    3.375877e-01  36
## 47488          0                    1.537609e+00  42
## 43915          0                    2.000874e-01  32
## 146651         0                    4.042069e-01  67
## 49179          0                    1.164418e-01  27
## 115347         0                    8.103610e-01  42
## 109045         0                    4.250650e-01  64
## 77977          0                    2.063935e-02  49
## 79393          0                    6.603510e-01  43
## 67220          0                    3.338293e-01  66
## 130868         0                    4.342626e-01  35
## 129222         0                    9.999999e-01  68
## 124144         0                    0.000000e+00  59
## 90027          0                    3.653881e-02  69
## 53521          0                    1.156485e-01  53
## 107534         0                    8.219671e-02  59
## 122838         0                    4.004235e-01  56
## 102517         0                    8.469819e-01  40
## 17073          0                    5.179774e-01  60
## 11494          0                    2.233184e-02  38
## 110583         0                    3.296688e-01  78
## 67522          0                    6.235800e-01  64
## 142576         0                    1.653760e-01  47
## 15221          0                    1.965889e-02  66
## 90523          0                    6.179908e-02  56
## 67044          0                    8.820464e-01  45
## 100182         0                    4.904510e-01  38
## 140550         0                    5.317925e-03  56
## 139253         0                    1.234310e-02  56
## 68139          0                    1.529451e-01  37
## 117266         0                    1.381346e-01  63
## 39789          0                    1.406942e-01  33
## 109736         0                    2.196768e-02  64
## 108901         0                    6.088471e-01  65
## 51511          0                    9.786735e-02  35
## 131551         0                    8.127856e-02  77
## 14655          0                    4.725153e-01  26
## 139534         0                    5.659011e-01  63
```

```
## 33230                0                        8.752669e-02  77
## 103671               0                        9.999999e-01  28
## 98113                0                        9.999999e-01  69
## 89753                0                        3.535715e-02  75
## 43759                0                        9.617806e-01  50
## 53590                0                        5.289860e-02  80
## 121763               0                        5.719192e-02  69
## 97252                0                        9.999999e-01  63
## 120072               0                        3.662782e-01  53
## 80695                0                        2.572265e-03  40
## 71457                0                        8.733127e-01  51
## 69787                0                        9.999999e-01  24
## 30021                0                        6.276966e-03  52
## 61780                0                        2.072124e-01  50
## 134575               0                        7.450850e-01  50
## 69416                0                        3.341991e-01  51
## 108905               0                        3.151324e-03  45
## 15851                0                        0.000000e+00  78
## 62720                0                        8.499660e-02  39
## 6869                 0                        2.242477e-01  56
## 78029                0                        9.999999e-01  22
## 55464                0                        9.999999e-01  71
## 109478               0                        8.048630e-04  79
## 107252               0                        1.792140e-01  30
## 131060               0                        7.336055e-01  41
## 113256               0                        2.487683e-02  74
## 39873                0                        3.679504e-01  61
## 38702                0                        1.619968e-02  38
## 69894                0                        0.000000e+00  39
## 55440                0                        5.657832e-01  46
## 10193                0                        9.393691e-01  31
## 79147                0                        1.754035e-01  50
## 55110                0                        7.521300e-04  51
## 4727                 0                        9.999999e-01  47
## 148985               0                        5.153249e-02  42
## 46201                0                        7.003208e-02  67
## 55636                0                        6.978073e-02  43
## 98195                0                        4.061047e-02  26
## 47617                0                        1.115349e-01  48
## 96196                0                        4.444065e-03  30
## 52250                0                        0.000000e+00  52
## 144704               0                        2.520160e-01  46
## 139148               0                        0.000000e+00  72
## 21861                0                        2.598881e-01  48
## 115432               0                        9.076186e-01  50
## 104033               0                        7.347742e-02  61
## 17860                0                        6.374681e-02  63
## 72388                0                        0.000000e+00  32
## 18887                0                        4.430847e-02  65
## 78980                0                        7.032763e-03  62
## 125591               0                        0.000000e+00  62
## 144770               0                        0.000000e+00  26
## 19078                0                        0.000000e+00  33
## 2499                 0                        8.666380e-04  83
```

```
## 100937                0                          2.977107e-01  63
## 1552                  0                          3.130934e-01  57
## 79091                 0                          3.273115e-02  58
## 30878                 0                          9.999999e-01  31
## 74084                 0                          2.774406e-03  77
## 4829                  0                          0.000000e+00  69
## 38781                 0                          2.908091e-02  64
## 138533                0                          4.557341e-01  50
## 106467                0                          5.647621e-02  74
## 114813                0                          9.999999e-01  30
## 6750                  0                          3.111805e-01  56
## 125435                0                          5.715945e-02  91
## 130898                0                          1.251025e-01  69
## 68111                 0                          1.125591e-01  52
## 91274                 0                          2.839166e-01  26
## 108179                0                          0.000000e+00  39
## 19542                 0                          4.650156e-01  41
## 12564                 0                          5.003506e-01  70
## 76809                 0                          1.555289e-01  49
## 10058                 0                          9.866535e-03  53
## 76262                 0                          2.828302e-01  26
## 124354                0                          1.822041e-01  71
## 132122                0                          2.480730e-01  47
## 103078                0                          3.103461e-02  80
## 148667                0                          9.660057e-01  59
## 40353                 0                          6.492565e-03  86
## 37570                 0                          7.555035e-01  33
## 119499                0                          7.509499e-01  38
## 138016                0                          9.604386e-02  49
## 98116                 0                          6.489783e-02  61
## 11958                 0                          9.999999e-01  41
## 6374                  0                          0.000000e+00  36
## 115056                0                          1.756727e-03  72
## 99567                 0                          0.000000e+00  54
## 92451                 0                          4.879805e-03  53
## 81013                 0                          7.862055e-02  76
## 61358                 0                          1.678626e-01  50
## 4276                  0                          6.957750e-01  50
## 79022                 0                          6.520518e-02  49
## 125547                0                          0.000000e+00  41
## 20489                 0                          8.697984e-01  52
## 43186                 0                          6.134507e-01  46
## 52732                 0                          2.691892e-02  37
## 109230                0                          3.231569e-01  60
## 135033                0                          1.450579e-02  78
## 62749                 0                          2.062974e-01  63
## 122225                0                          7.621450e-04  78
## 19209                 0                          7.395994e-02  57
## 53382                 0                          5.899607e-02  70
## 106272                0                          2.299864e-01  63
## 79468                 0                          4.382983e-01  55
## 46444                 0                          1.152229e-02  34
## 64191                 0                          5.916056e-01  46
## 146049                0                          0.000000e+00  30
```

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## 82114                0                          2.834111e-02  46
## 7796                 0                          0.000000e+00  49
## 39915                0                          5.121840e-01  66
## 99359                0                          9.736106e-01  33
## 83912                0                          9.999999e-01  35
## 6056                 0                          0.000000e+00  24
## 134364               0                          4.140175e-02  37
## 104825               0                          1.837438e-01  58
## 72569                0                          8.997800e-01  56
## 110041               0                          4.087104e-02  46
## 117588               0                          4.401451e-02  55
## 130078               0                          3.305460e-01  45
## 3308                 0                          4.411387e-01  46
## 5881                 0                          9.346026e-01  41
## 101426               0                          4.235888e-01  82
## 88810                0                          0.000000e+00  36
## 120150               0                          2.459508e-02  42
## 92694                0                          0.000000e+00  35
## 86750                0                          1.470474e-01  56
## 112330               0                          1.344821e-01  59
## 49286                0                          5.741703e-01  28
## 30295                0                          0.000000e+00  47
## 67827                0                          9.365236e-01  44
## 12424                0                          9.999999e-01  28
## 30635                0                          9.999999e-01  28
## 24988                0                          1.389085e-01  27
## 89915                0                          2.854898e-01  60
## 18234                0                          4.406289e-02  59
## 78502                0                          4.718114e-03  56
## 110480               0                          5.205576e-02  37
## 73303                0                          9.374531e-02  47
## 18715                0                          0.000000e+00  42
## 120286               0                          1.918621e-02  31
## 4270                 0                          5.994006e-02  23
## 90716                0                          9.009199e-01  38
## 31277                0                          1.975848e-01  48
## 131724               0                          7.703368e-01  48
## 47622                0                          1.538853e-01  35
## 7940                 0                          1.064565e-01  48
## 3779                 0                          5.796136e-02  23
## 87547                0                          3.842521e-02  76
## 29971                0                          0.000000e+00  61
## 109760               0                          9.518096e-02  58
## 19350                0                          2.095470e-02  60
## 134571               0                          3.213154e-01  60
## 25991                0                          5.033614e-03  88
## 37687                0                          2.104287e-02  67
## 134951               0                          6.927208e-01  56
## 22979                0                          2.109720e-01  63
## 122583               0                          7.153296e-03  64
## 25628                0                          2.642710e-01  57
## 2259                 0                          3.260446e-02  66
## 140855               0                          4.320242e-01  74
## 102182               0                          4.892232e-03  55
```

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## 9835                    0                          3.582102e-02  75
## 28460                   0                          1.312104e-01  79
## 64828                   0                          1.823974e-01  65
## 102836                  0                          2.301730e-02  63
## 83942                   0                          6.977616e-01  40
## 39893                   0                          3.977557e-02  45
## 145905                  0                          1.350509e-01  27
## 149047                  0                          0.000000e+00  30
## 59580                   0                          4.465738e-01  41
## 123210                  0                          4.776721e-01  31
## 22023                   0                          2.142817e-02  35
## 25241                   0                          5.460199e-01  48
## 27705                   0                          3.580026e-03  40
## 74857                   0                          5.011175e-02  58
## 45131                   0                          6.408030e-02  55
## 27185                   0                          9.028194e-01  29
## 46345                   0                          9.999999e-01  24
## 76294                   0                          1.517639e-01  45
## 40481                   0                          9.479192e-03  56
## 117333                  0                          1.389931e-02  53
## 147891                  0                          5.999747e-02  63
## 20878                   0                          7.702065e-01  49
## 119574                  0                          1.655323e-02  69
## 132906                  0                          5.896388e-02  81
## 144147                  0                          1.582086e-02  72
## 109238                  0                          1.384541e-01  42
## 88606                   0                          4.780725e-02  59
## 53640                   0                          4.080672e-03  56
## 20382                   0                          0.000000e+00  33
## 49200                   0                          7.098382e-01  45
## 19203                   0                          8.236576e-02  58
## 3697                    0                          2.026121e-01  43
## 115017                  0                          7.440250e-04  62
## 138718                  0                          5.500792e-01  48
## 19133                   0                          7.575470e-02  42
## 7050                    0                          5.293882e-01  33
## 109528                  0                          1.060646e+00  39
## 67678                   0                          3.209467e-01  59
## 57938                   0                          1.599360e-01  30
## 83126                   0                          9.445866e-02  49
## 35217                   0                          9.498607e-02  33
## 46638                   0                          6.917147e-01  41
## 116233                  0                          6.415586e-02  36
## 110549                  0                          0.000000e+00  27
## 52286                   0                          1.401568e-01  42
## 11580                   0                          7.786680e-01  56
## 105401                  0                          2.171589e-01  42
## 100401                  0                          9.307611e-02  36
## 63967                   0                          2.934366e-02  52
## 73603                   0                          2.853991e-02  76
## 138842                  0                          5.166526e-01  33
## 45505                   0                          2.902323e-01  75
## 111731                  0                          5.585055e-02  53
## 31373                   0                          9.482072e-01  44
```

```
## 13301                0                        1.545742e-01  47
## 3219                 0                        1.584196e-02  85
## 39001                0                        6.945894e-02  54
## 145576               0                        9.999999e-01  30
## 126912               0                        6.500265e-01  45
## 111136               0                        1.867357e-02  47
## 40888                0                        7.148228e-01  40
## 52103                0                        7.248271e-01  23
## 9319                 0                        3.887827e-02  53
## 141075               0                        8.716228e-02  52
## 80860                0                        7.386033e-01  40
## 132264               0                        4.745905e-02  78
## 73850                0                        8.706911e-01  46
## 140439               0                        7.503358e-01  47
## 143924               0                        8.035581e-02  33
## 29827                0                        2.880936e-02  88
## 40561                0                        1.488415e-01  54
## 73167                0                        0.000000e+00  46
## 102892               0                        2.277302e-02  64
## 37610                0                        0.000000e+00  71
## 122238               0                        4.655379e-01  27
## 8836                 0                        3.670657e-02  48
## 18042                0                        9.278144e-02  50
## 38810                0                        2.417181e-02  46
## 110738               0                        0.000000e+00  27
## 125818               0                        2.590172e-01  62
## 146585               0                        6.562485e-02  48
## 84456                0                        1.076835e-01  23
## 20665                0                        9.999999e-01  25
## 97755                0                        6.254657e-02  55
## 63136                0                        1.047973e-01  54
## 23843                0                        2.851603e-02  70
## 136491               0                        1.680871e-01  39
## 32176                0                        1.977356e-02  49
## 83767                0                        1.434023e-01  50
## 49119                0                        3.980002e-01  59
## 45552                0                        1.347015e-01  50
## 57166                0                        0.000000e+00  42
## 60465                0                        9.999999e-01  23
## 141213               0                        1.025685e-02  92
## 145631               0                        1.995594e-01  48
## 142511               0                        8.673066e-01  73
## 11861                0                        2.237620e-01  77
## 52209                0                        3.294537e-01  62
## 147588               0                        1.907406e-02  70
## 125921               0                        2.867294e-01  47
## 133480               0                        3.669714e-01  62
## 36557                0                        2.413640e-01  58
## 61731                0                        6.563437e-01  23
## 110678               0                        3.857079e-01  57
## 82919                0                        1.630157e-01  48
## 86587                0                        6.420951e-02  57
## 100103               0                        3.832235e-02  45
## 105662               0                        9.684126e-01  28
```

```
## 25203                0                        7.601067e-01  36
## 30                   0                        3.929946e-01  58
## 51679                0                        0.000000e+00  29
## 19161                0                        0.000000e+00  50
## 5823                 0                        1.382104e-01  26
## 134419               0                        1.299590e-01  50
## 36095                0                        9.999999e-01  68
## 104015               0                        3.892592e-01  29
## 128011               0                        9.999999e-01  74
## 65911                0                        9.999999e-01  30
## 62726                0                        2.543110e-01  39
## 1458                 0                        6.731895e-01  35
## 36320                0                        7.357859e-02  58
## 87739                0                        6.337104e-02  75
## 47328                0                        2.901420e-01  61
## 9641                 0                        1.415818e-01  60
## 92625                0                        2.842500e-01  43
## 91093                0                        1.458755e-02  35
## 58609                0                        3.888635e-02  26
## 34600                0                        2.666630e-04  53
## 90354                0                        3.577092e-02  61
## 64254                0                        3.480273e-02  65
## 107474               0                        2.045374e-01  46
## 137390               0                        3.464357e-01  27
## 48646                0                        6.508035e-02  61
## 26090                0                        9.437492e-01  59
## 8226                 0                        8.427144e-01  27
## 23273                0                        4.286132e-01  50
## 80140                0                        9.999999e-01  56
## 52922                0                        0.000000e+00  61
## 81278                0                        4.091059e-01  34
## 132895               0                        2.385043e-02  80
## 73898                0                        6.835470e-02  64
## 46745                0                        1.014663e+00  48
## 27756                0                        1.037523e-01  53
## 80940                0                        8.721277e-02  48
## 100868               0                        3.610319e-01  38
## 13836                0                        2.116319e-02  64
## 46930                0                        5.345972e-01  78
## 16560                0                        7.198691e-02  31
## 122308               0                        1.175901e-01  53
## 140576               0                        8.089048e-02  42
## 143935               0                        8.280991e-03  51
## 141918               0                        9.296836e-01  32
## 133766               0                        9.849074e-03  37
## 88974                0                        4.489551e-01  31
## 40730                0                        6.831752e-01  61
## 123055               0                        0.000000e+00  70
## 21021                0                        8.805710e-02  43
## 25100                0                        1.052705e-01  49
## 22872                0                        7.875918e-01  71
## 96186                0                        7.083065e-03  45
## 98415                0                        9.762048e-01  37
## 90628                0                        4.175608e-01  62
```

```
## 90955                0                          2.336856e-01  53
## 95241                0                          2.672300e-02  57
## 143869               0                          8.146412e-01  61
## 82309                0                          1.615033e-01  63
## 135332               0                          9.999999e-01  34
## 135604               0                          4.311914e-02  50
## 108025               0                          1.812047e-01  67
## 59663                0                          7.903359e-02  57
## 18515                0                          4.349539e-02  34
## 105826               0                          8.828394e-01  56
## 36951                0                          1.824772e-01  58
## 109217               0                          5.744106e-02  33
## 136086               0                          8.834117e-01  29
## 67230                0                          2.459629e-02  32
## 62333                0                          7.752450e-01  49
## 116892               0                          0.000000e+00  48
## 15338                0                          8.762229e-01  39
## 83532                0                          4.976121e-02  70
## 29163                0                          4.883180e-01  29
## 46098                0                          0.000000e+00  54
## 130025               0                          4.614555e-01  52
## 99372                0                          8.832965e-02  79
## 29495                0                          4.173329e-03  64
## 109393               0                          0.000000e+00  47
## 66566                0                          1.078306e-01  36
## 46646                0                          4.729572e-01  59
## 134901               0                          6.552980e-01  48
## 2735                 0                          1.418918e-02  81
## 105575               0                          2.460157e-02  61
## 47892                0                          3.261338e-03  60
## 20319                0                          1.060017e-01  47
## 137379               0                          9.364028e-02  69
## 31844                0                          7.668545e-02  66
## 97788                0                          2.172891e-01  37
## 95220                0                          6.307983e-01  33
## 107340               0                          6.261748e-01  38
## 49243                0                          3.832515e-01  27
## 140283               0                          5.112928e-01  41
## 132347               0                          1.173983e-01  45
## 42100                0                          9.872188e-01  43
## 124542               0                          9.999999e-01  27
## 142307               0                          6.101921e-02  68
## 635                  0                          5.788785e-02  56
## 20979                0                          1.334455e-01  50
## 57693                0                          9.982250e-02  38
## 116691               0                          7.044410e-02  54
## 18243                0                          0.000000e+00  28
## 37733                0                          7.441841e-01  53
## 104707               0                          5.895711e-03  29
## 44576                0                          1.660900e-02  66
## 402                  0                          2.556199e-03  58
## 129316               0                          2.282723e-01  41
## 11196                0                          0.000000e+00  30
## 23560                0                          9.966674e-01  41
```

```
## 134411                0                        6.826347e-01  36
## 2748                  0                        2.389662e-02  53
## 47204                 0                        1.224270e+00  57
## 100517                0                        2.094453e+00  35
## 78135                 0                        3.169417e-01  38
## 76402                 0                        3.051626e-01  49
## 119579                0                        2.112173e-02  36
## 40958                 0                        9.999999e-01  27
## 59428                 0                        2.423283e-01  62
## 45824                 0                        9.360800e-02  26
## 122220                0                        1.562346e-01  51
## 48164                 0                        7.620890e-01  40
## 92733                 0                        9.999999e-01  64
## 30824                 0                        0.000000e+00  25
## 144809                0                        6.150404e-01  39
## 57762                 0                        2.455698e-02  40
## 43015                 0                        5.689154e-01  66
## 134399                0                        1.769495e-01  61
## 135324                0                        4.278868e-01  58
## 106944                0                        1.625147e-01  39
## 35877                 0                        2.633114e-02  43
## 79673                 0                        9.647111e-01  24
## 75068                 0                        4.321523e-01  35
## 96021                 0                        1.031802e-02  51
## 36087                 0                        9.999999e-01  32
## 20163                 0                        4.575556e-02  53
## 97068                 0                        9.999999e-01  63
## 78088                 0                        2.250059e-02  71
## 49928                 0                        2.688077e-02  72
## 140255                0                        2.824629e-02  41
## 44922                 0                        0.000000e+00  37
## 110621                0                        2.850636e-03  65
## 122490                0                        4.484240e-01  33
## 31165                 0                        1.658574e-02  38
## 145684                0                        9.865564e-01  27
## 113131                0                        9.129789e-01  43
## 110014                0                        2.133152e-01  30
## 147310                0                        4.187906e-01  25
## 1848                  0                        5.193027e-01  40
## 144224                0                        9.999999e-01  25
## 108903                0                        1.994786e-01  71
## 45642                 0                        1.060743e+00  74
## 94594                 0                        2.551442e-01  58
## 81187                 0                        6.988264e-02  53
## 78075                 0                        0.000000e+00  50
## 107718                0                        1.190419e-02  55
## 123180                0                        1.247236e-01  64
## 91698                 0                        5.389446e-02  51
##        NumberOfTime30.59DaysPastDueNotWorse    DebtRatio MonthlyIncome
## 35580                                     0 4.228743e-01          7973
## 46953                                     0 6.090246e-01          3700
## 52453                                     0 2.183726e-01          5050
## 24027                                     0 1.187000e+03             0
## 1521                                      0 5.638525e-01          3280
```

```
## 61774                                    0 4.754493e-01          6231
## 57130                                    0 1.806534e-01          3121
## 80283                                    0 1.490232e-01          2200
## 145496                                   1 5.097047e-01          8500
## 46162                                    0 5.558667e-01          7499
## 19398                                    0 2.672475e-01          7000
## 88300                                    1 4.725877e-01          2735
## 7429                                     2 7.402568e-01          4438
## 42092                                    0 3.796664e-01          1258
## 105437                                   0 2.198534e-02          1500
## 15786                                    0 2.127220e-02          4841
## 146690                                   0 1.460927e-01          6666
## 140730                                   0 2.857662e-01          5500
## 46821                                    0 3.098340e-01          3914
## 58102                                    0 3.244189e-01          4000
## 137929                                   0 7.495001e-01          5500
## 64582                                    1 4.998750e-04          4000
## 42318                                    0 2.234628e-01          6000
## 52970                                    0 1.533731e-01          5365
## 12848                                    0 4.926241e-01          4812
## 47977                                    0 1.355521e-01          7000
## 76624                                    0 4.794082e-01          2500
## 68296                                    0 8.523182e-01          6750
## 59573                                    0 1.369090e-01          4250
## 25961                                    3 3.771679e-01          5246
## 67477                                    0 3.510794e-01          5465
## 120588                                   0 2.845994e-01          8200
## 14289                                    0 3.287343e-01          5000
## 131394                                   0 3.250000e+02             1
## 108140                                   0 1.277000e+03             0
## 45005                                    0 2.564846e-01          6900
## 21012                                    0 1.991260e-01          6864
## 149334                                   0 4.477995e-01          5066
## 48644                                    0 5.367976e-01          7812
## 18405                                    0 1.186459e+00           900
## 62018                                    0 1.326076e-01          4041
## 134377                                   1 2.946955e-02          7125
## 59971                                    0 2.396645e-03          1668
## 16834                                    0 4.895105e-02          1000
## 24349                                    0 2.885382e-01          6019
## 65634                                    0 3.665948e-02          5100
## 132439                                   0 3.912444e-02          5801
## 129102                                   2 1.404775e-01          1800
## 84842                                    0 5.371531e-03          2233
## 25367                                    1 4.681535e-01          4662
## 69526                                    0 1.669449e-02          4791
## 127629                                   0 7.836198e-02          3955
## 130867                                   0 1.028345e-01          4550
## 53803                                    0 6.764645e-01          4796
## 140520                                   0 1.025823e+00          2400
## 8598                                     0 4.361520e-01          5841
## 22097                                    0 1.764706e-01           900
## 41262                                    0 6.902899e-02          2172
## 128569                                   0 1.102696e+00          6416
```

```
## 65612                                    0 5.268414e-01          800
## 12510                                    0 3.567423e-01         4100
## 59602                                    0 3.489302e-01         5000
## 123838                                   0 0.000000e+00         1800
## 91758                                    0 3.548258e-01         7490
## 43316                                    0 3.002991e-01         7355
## 46064                                    0 1.333333e-01         3569
## 103290                                   0 1.265963e-01         1800
## 106964                                   0 8.198360e-01         5000
## 64264                                    0 1.881412e+00         1500
## 136198                                   0 2.896406e-01         2837
## 104056                                   0 9.260000e+02            0
## 82370                                    0 1.157691e-01         3100
## 100651                                   0 9.256085e-03         5833
## 100839                                   0 1.055276e-01         3780
## 22793                                    0 5.170615e-01         4600
## 146335                                   0 3.811309e-02         3200
## 58469                                    0 6.726050e-02         5500
## 63622                                    0 2.678937e-01         4400
## 50792                                    0 3.789365e-01         1936
## 20230                                    0 1.892702e-01         3000
## 35691                                    0 5.117704e-01         3100
## 145813                                   0 2.089615e-01         2387
## 60388                                    0 1.799486e-01         3500
## 38157                                    0 1.667474e+00         1650
## 83580                                    0 0.000000e+00         6816
## 81508                                    0 2.712572e-02         5750
## 14108                                    0 2.817385e-01         5820
## 86628                                    0 2.827051e-01         1803
## 60348                                    1 1.596665e-01         3237
## 13906                                    0 2.939922e-01         5625
## 30467                                    0 2.795899e-02         3218
## 135337                                   0 2.614897e-01         4416
## 90586                                    0 5.610234e-01         8168
## 15862                                    1 2.239468e-01         7666
## 145689                                   0 2.944000e+03            0
## 69899                                    0 1.997499e-01         5596
## 110190                                   0 6.498375e-03         4000
## 101006                                   1 4.097650e-01         6000
## 117549                                   0 1.202932e-01         3000
## 25395                                    0 1.909727e-01         7000
## 13715                                    0 6.080247e-01         5831
## 63920                                    0 7.483576e-02         3500
## 35383                                    0 6.922504e-01         1341
## 39419                                    0 1.841632e-01         5000
## 104925                                   0 0.000000e+00         1855
## 2005                                     0 3.935901e-01         6333
## 91013                                    0 2.436054e-03          820
## 106956                                   0 4.945055e-03         1819
## 116549                                   0 1.888539e-01         5400
## 136746                                   0 5.299352e-01         7866
## 96796                                    0 2.277904e-03         7462
## 30629                                    0 3.468844e-01         3000
## 73382                                    0 2.483261e-01         8512
```

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## 90238                                    0 2.968700e-01          3098
## 125086                                   0 9.839213e-03          4166
## 1277                                     0 8.018730e-02          6833
## 26226                                    0 5.440212e-01          7166
## 20789                                    0 3.682461e-01          4811
## 6967                                     0 9.169909e-01          3083
## 3139                                     0 2.449772e-01          4379
## 136776                                   0 2.070935e-02          4200
## 77752                                    1 4.875025e-01          5000
## 95117                                    2 4.132081e-01          3300
## 3710                                     0 2.439187e-01          3000
## 83449                                    0 6.110740e-02          7494
## 97425                                    0 4.898844e-01          3459
## 148776                                   0 7.116056e-01          4583
## 99915                                    0 1.286570e-01          5844
## 36781                                    0 8.619148e-01          4250
## 10537                                    1 4.005538e-01          6500
## 67045                                    1 1.695804e-01          2859
## 71089                                    0 9.383590e-01          2400
## 54096                                    1 6.845878e-02          8369
## 99962                                    0 3.475637e-01          4473
## 61211                                    0 2.861322e-01          7520
## 30218                                    0 3.662207e-01          5381
## 52036                                    0 0.000000e+00          1950
## 10089                                    0 6.654539e-01          6046
## 39129                                    0 1.836340e-02          3103
## 11238                                    0 4.454770e-01          8500
## 140972                                   0 4.102120e-01          7500
## 146581                                   4 5.340838e-01          6395
## 128262                                   0 4.168659e-01          4600
## 149596                                   0 4.005999e-01          6000
## 5168                                     0 6.604420e-01          8460
## 142800                                   1 2.407075e-01          3900
## 109385                                   0 2.787709e+00          2326
## 11779                                    0 4.750000e-02          8399
## 4169                                     0 4.090673e-01          7697
## 87546                                    0 4.092145e-01          6250
## 105612                                   0 1.627674e-01          5000
## 40172                                    1 1.524390e-02          3279
## 97179                                    0 4.571086e-01          5000
## 72936                                    0 5.880252e-02          8400
## 140856                                   1 2.969314e-01          4431
## 95437                                    0 6.117059e-01          1400
## 59486                                    0 1.850147e-01          7166
## 90546                                    0 1.096548e-01          5416
## 41040                                    0 7.670708e-01          4700
## 102471                                   0 1.169026e+00          1200
## 68699                                    0 1.704320e-02          5045
## 99513                                    0 5.802708e-01          3618
## 124044                                   0 6.288571e-01          5800
## 31164                                    0 2.003783e-01          7400
## 53572                                    0 1.057692e-02          5199
## 127885                                   0 2.203709e-01          3720
## 124506                                   1 6.506492e-02          6700
```

```
## 79691                                    0 4.817645e-01          2878
## 81492                                    0 4.474708e-01          3083
## 103067                                   0 7.550645e-02          3800
## 42238                                    0 1.149713e-02          4000
## 64952                                    0 5.840258e-02          4331
## 44757                                    0 2.254790e-04          4434
## 104418                                   0 2.999760e-03          8333
## 81694                                    0 4.319280e-01          6000
## 79257                                    1 2.877102e-01          3864
## 82074                                    0 3.422205e-01          5250
## 49638                                    0 8.143642e-02          5095
## 80741                                    0 5.757104e-01          2568
## 115809                                   0 2.814120e-01          4050
## 96165                                    0 5.123147e+00           876
## 17253                                    0 2.106332e-01          5416
## 108834                                   0 3.288067e-01          6921
## 85185                                    0 2.567584e-02          8100
## 3310                                     1 4.028327e-01          4800
## 74657                                    0 2.876187e-01          6000
## 31402                                    0 1.047449e+00          4488
## 4124                                     0 2.199732e-01          8200
## 24356                                    0 6.314779e-01          4688
## 122869                                   1 2.719094e-01          3000
## 31798                                    0 2.913543e-01          2000
## 19618                                    0 5.359300e-01          4800
## 92874                                    0 4.017645e-01          7140
## 69078                                    0 7.008153e-01          6500
## 64331                                    0 1.207117e+00          2500
## 18632                                    0 5.276859e-01          7259
## 120866                                   0 2.531160e-01          8343
## 29466                                    0 4.416194e-01          4050
## 58537                                    0 6.156280e-01          3160
## 6639                                     1 2.641914e-01          2800
## 82040                                    0 3.026564e-01          5834
## 91052                                    0 0.000000e+00          2375
## 13759                                    0 1.917415e-01          8354
## 72625                                    0 1.120367e-01          2400
## 73541                                    0 2.788290e-01          2800
## 104924                                   0 8.083387e-02          4700
## 63784                                    0 3.437760e-01          6000
## 106701                                   0 2.595680e-01          7916
## 140150                                   0 4.663212e-02          7333
## 18796                                    0 3.519014e-01          5600
## 41852                                    0 6.625514e-01          1700
## 85465                                    0 8.524788e-02          4961
## 51519                                    0 2.978003e-01          6500
## 2879                                     0 4.665112e-03          3000
## 98506                                    0 7.831603e-01          2600
## 33754                                    0 2.597481e-01          5000
## 61219                                    0 1.354889e+00          3200
## 126327                                   3 4.109047e-01          5813
## 17503                                    0 7.515463e-02          8568
## 70778                                    0 9.425878e-02          3500
## 109741                                   0 5.071313e-01          6800
```

```
## 143027                                    3 2.097238e-01          8000
## 12497                                     5 2.713798e-01          8500
## 87836                                     0 4.671090e-01          7083
## 61532                                     1 4.226628e-01          5850
## 4278                                      1 3.803742e-01          7000
## 117571                                    0 0.000000e+00          1177
## 98762                                     0 3.029507e-01          8370
## 131682                                    0 3.298337e-01          7333
## 126181                                    0 2.202228e-01          3500
## 10778                                     0 3.918630e-01          1400
## 143293                                    0 6.074696e-01          6666
## 4666                                      0 2.857429e-01          5000
## 6631                                      0 9.713232e-01          8403
## 20940                                     0 3.013968e-01          5583
## 57355                                     0 9.764838e-01          6250
## 8380                                      1 6.963407e-01          8334
## 34667                                     0 1.475289e-03          4066
## 63550                                     0 7.111746e-01          2800
## 25058                                     0 5.884033e-02          3500
## 35869                                     0 3.229578e-01          6842
## 53291                                     0 0.000000e+00          4720
## 106189                                    0 1.917585e-01          2450
## 104325                                    0 1.345275e-01          5470
## 63167                                     0 1.403844e-01          7856
## 64112                                     0 2.193071e-01          2972
## 145282                                    0 2.456267e-01          6916
## 144139                                    0 6.627723e-01          3166
## 52631                                     0 3.447571e-01          4405
## 131645                                    0 4.559971e-01          5510
## 75053                                     0 5.388614e-01          4039
## 21321                                     0 5.004807e-01          5200
## 74091                                     0 8.928777e-01          5208
## 110825                                    0 4.035446e-01          4400
## 33270                                     0 3.264657e-01          6600
## 62172                                     1 4.472771e-01          7491
## 149500                                    0 2.900518e-01          5598
## 47860                                     0 6.408202e-03          3120
## 32217                                     0 4.033748e-01          8118
## 4594                                      0 3.986973e-01          2916
## 97023                                     0 9.358400e-01          3350
## 45501                                     0 5.118060e-01          4700
## 19970                                     0 2.601926e-01          7578
## 145012                                    0 3.488694e-01          6500
## 46570                                     0 2.692913e-01          1269
## 57788                                     0 2.682165e-01          8000
## 61960                                     0 1.322150e-01          3516
## 4370                                      0 2.436145e-01          4658
## 65064                                     0 7.721393e+00           200
## 22525                                     0 3.027179e-01          3200
## 16184                                     0 1.630761e-01          3666
## 20937                                     0 1.614081e-01          6845
## 122894                                    0 0.000000e+00          5000
## 9809                                      1 5.436820e-01          8000
## 121191                                    0 5.454294e-01          3620
```

```
## 64812                                    0 2.645868e-01          6666
## 91455                                    1 3.188406e-01          4001
## 40971                                    0 6.372292e-01          4200
## 116730                                   0 1.919651e-01          5500
## 50615                                    0 0.000000e+00          5172
## 114321                                   1 1.477704e-01          5000
## 27566                                    0 4.845989e-01          5583
## 109724                                   0 6.407606e-01          5416
## 5152                                     0 1.124297e-02          1600
## 27654                                    2 1.616541e-01          5053
## 116889                                   1 5.335933e-01          3333
## 134404                                   0 1.664584e-01          4000
## 4339                                     0 2.695698e-01          7600
## 101093                                   0 1.775290e-01          2500
## 54408                                    0 2.715457e-01          5000
## 11299                                    0 2.298851e-01          2000
## 129191                                   0 5.854163e-01          5800
## 143777                                   0 6.562111e-01          4016
## 92858                                    0 3.106098e-01          4033
## 77353                                    0 4.994858e-01          2916
## 74228                                    0 2.431307e-01          1200
## 98536                                    0 8.257279e-03          2300
## 104905                                   0 1.316447e-01          6000
## 138162                                   1 2.862039e-01          3500
## 68447                                    0 4.911015e-01          2078
## 51945                                    0 1.103041e+00          1775
## 45921                                    0 1.320755e-01          6200
## 23368                                    0 2.653414e-01          2313
## 138970                                   0 2.033554e-03          5900
## 92313                                    0 2.560976e-01          5083
## 112928                                   0 3.101572e-01          6615
## 84234                                    0 1.211515e-01          2500
## 120859                                   0 1.262275e+00          1669
## 93196                                    0 3.274510e-01          4079
## 117555                                   0 1.586916e-01          7000
## 66177                                    0 2.179431e-01          6854
## 84130                                    0 2.845403e-01          5840
## 100068                                   0 4.292614e-01          4968
## 104257                                   0 1.121146e-01          7750
## 134829                                   0 6.170886e-02          3791
## 28669                                    1 6.814936e-02          4900
## 148998                                   0 1.023973e-02          8300
## 135065                                   0 5.793991e-02          5125
## 89160                                    0 1.945213e-01          6862
## 8657                                     0 8.495752e-03          2000
## 72090                                    1 8.586850e-01          4075
## 106658                                   0 3.979534e-03          1758
## 44760                                    0 1.244689e-01          4000
## 60424                                    0 4.738410e-01          5370
## 11244                                    0 2.779754e-01          6183
## 95715                                    0 4.276402e-01          2300
## 76958                                    0 2.911023e-01          5832
## 51967                                    0 1.814583e-01          3030
## 104563                                   0 3.136247e-01          5834
```

```
## 78279                                    0 3.778311e-01          6666
## 78598                                    0 8.995048e-01          3432
## 69283                                    1 3.837694e-01          6000
## 74049                                    1 5.648870e-01          5000
## 39838                                    0 2.569679e-01          8000
## 97071                                    0 3.948839e-01          3400
## 83305                                    1 3.796931e-01          6125
## 144977                                   0 3.832822e-01          7500
## 92989                                    0 2.179728e-01          8000
## 99481                                    0 9.716759e-02          5083
## 74800                                    0 1.109350e-01          4416
## 134488                                   0 1.612407e-01          3900
## 126335                                   0 1.294709e-01          5367
## 136017                                   0 5.828852e-01          4276
## 20434                                    0 6.465409e-01          4769
## 10264                                    0 3.816645e-01          4613
## 59691                                    1 0.000000e+00          3003
## 63767                                    0 2.616270e-01          6084
## 113541                                   0 1.127910e-02          4166
## 125563                                   0 5.327738e-01          5003
## 106855                                   0 9.146083e-01          2833
## 24259                                    0 5.064978e-01          3000
## 90767                                    0 4.039983e-02          2400
## 36206                                    0 4.629945e-01          4701
## 90933                                    0 6.337104e-01          4419
## 104320                                   0 2.660885e-01          5764
## 25479                                    0 8.285857e-01          2000
## 87144                                    0 4.838710e-01          2200
## 38378                                    0 3.768344e-01          1907
## 10395                                    0 4.224472e-02          8000
## 64287                                    0 4.240667e-01          2758
## 136625                                   0 2.871287e-01          3433
## 79983                                    0 2.256281e-01          1989
## 108015                                   1 2.078091e-01          2304
## 71640                                    0 7.460414e-02          3283
## 85674                                    0 1.272342e-02          3300
## 94329                                    0 0.000000e+00          2283
## 35001                                    0 4.476777e-03          5360
## 121349                                   0 1.156435e-01          7427
## 9455                                     1 8.103837e-01          3100
## 13528                                    0 9.271137e-01          2400
## 104103                                   0 1.256248e-01          3000
## 104410                                   0 6.046653e-01          3300
## 50632                                    1 5.404472e-01          5500
## 74861                                    0 1.719312e-01          2500
## 127017                                   0 4.410632e-01          5454
## 146988                                   2 8.918334e-02          7848
## 124162                                   0 6.223594e-01          7289
## 133253                                   0 6.627786e-01          4800
## 65645                                    0 3.006000e+03             0
## 45709                                    0 2.173466e-01          5833
## 124132                                   0 6.755469e-01          5667
## 117188                                   0 3.422072e-01          8000
## 39089                                    0 2.002777e-01          2880
```

```
## 21045                                    1 2.887048e-01          6639
## 11665                                    0 6.940000e+02             0
## 9929                                     0 4.189748e-01          3140
## 52571                                    4 1.872606e+00          1200
## 109562                                   0 4.663558e-03          1500
## 99686                                    0 6.238088e-01          6400
## 111235                                   0 4.039151e-01          6691
## 28706                                    0 1.321356e-01          3450
## 11510                                    0 2.839037e-01          7100
## 96222                                    0 3.865808e-01          4500
## 62050                                    0 4.123437e-02          3758
## 137883                                   1 2.099029e-01          8441
## 72999                                    0 5.423874e-01          8150
## 22617                                    0 7.579129e-01          6381
## 7341                                     0 2.678675e-01          6883
## 7545                                     0 9.020784e-02          4666
## 12991                                    0 8.548581e-01          2500
## 27629                                    0 3.803696e-01          8333
## 112822                                   3 9.102724e-01          4000
## 25925                                    0 6.134838e-01          7000
## 47502                                    1 4.023991e-01          2750
## 131130                                   0 1.195607e-01          4825
## 134894                                   0 4.196057e-01          3600
## 35937                                    0 6.645376e-01          3600
## 27545                                    0 6.243775e-01          4216
## 119348                                   0 5.865209e-01          2195
## 131072                                   0 4.156053e-01          7458
## 59435                                    0 9.866196e-02          6800
## 9470                                     0 5.606170e-01          6936
## 110850                                   0 6.649169e-02          8000
## 68109                                    0 8.417784e-01          4025
## 33711                                    0 4.481977e-01          4410
## 99795                                    0 1.542467e-01          3072
## 60474                                    2 2.475007e-01          3700
## 21909                                    0 3.834466e-01          2500
## 10283                                    3 4.023845e-01          6038
## 98503                                    0 5.339690e-01          5872
## 106397                                   0 9.029345e-03          3100
## 62023                                    1 6.486718e-01          3500
## 148160                                   4 4.309054e-01          2937
## 73624                                    0 9.596162e-03          2500
## 21508                                    1 7.801418e-02          8600
## 88829                                    0 8.393945e-01          5416
## 29128                                    0 1.139241e-01          1500
## 47462                                    0 2.707835e-01          7529
## 2649                                     0 0.000000e+00          8500
## 5110                                     0 1.175433e-03          6805
## 12160                                    0 4.596351e-01          4000
## 80987                                    0 0.000000e+00          3366
## 66345                                    1 3.302478e-01          3348
## 94722                                    0 4.065528e-01          2166
## 56156                                    0 4.654046e-01          7500
## 38733                                    0 1.042708e+00          7000
## 89830                                    0 3.182527e-01          6409
```

```
## 2754                                    0 1.474264e-01          4720
## 124565                                  0 5.445688e-01          4823
## 89894                                   2 2.921747e-01          4510
## 36477                                   1 1.122195e-01           400
## 8118                                    0 1.071046e-01          2800
## 96294                                   0 8.781613e-01          5416
## 101364                                  0 4.893794e-01          2400
## 95705                                   0 6.641930e-01          4850
## 43697                                   1 7.048238e-02          4000
## 144045                                  0 2.964629e-01          8000
## 21457                                   0 3.281053e-01          7140
## 81097                                   0 4.250122e-02          2046
## 42269                                   0 4.603942e-01          2688
## 147214                                  0 2.448090e-01          3900
## 117393                                  0 3.500000e+01             0
## 22992                                   0 6.123469e-02          4000
## 16678                                   0 3.328999e-01          1537
## 59243                                   0 8.088033e-02          3634
## 53349                                   0 1.602239e-01          3750
## 112348                                  0 2.017497e-01          5600
## 11230                                   0 3.482496e-01          7083
## 144130                                  1 2.390544e-01          6006
## 28933                                   0 3.998001e-03          2000
## 97382                                   0 5.763257e-01          5600
## 128678                                  0 1.183285e-01          2416
## 112572                                  0 4.258510e-01          4200
## 89732                                   0 3.642126e-01          2050
## 53639                                   0 1.396002e+00          2600
## 59455                                   0 9.373236e-02          3541
## 53591                                   0 1.328240e-01          3402
## 132229                                  2 6.441779e-01          2000
## 31170                                   0 3.615040e-01          5584
## 119046                                  2 2.592712e-01          3100
## 138338                                  1 3.812204e-01          7816
## 115461                                  0 4.597327e-01          5835
## 103047                                  2 3.270486e-01          5515
## 143135                                  0 1.301944e-02          5606
## 71667                                   0 1.849076e-02          2000
## 63070                                   0 9.307135e-03          2900
## 88587                                   0 5.545431e-02          3840
## 119923                                  0 5.633803e-02          2200
## 63202                                   0 4.560811e-01          7103
## 81071                                   0 7.517842e-01          7005
## 89459                                   0 8.623853e-01          1852
## 20991                                   0 7.123887e-02          6400
## 139942                                  0 1.557086e+00          2250
## 85880                                   0 8.569898e-03          5600
## 132581                                  0 5.207207e-01          3329
## 49724                                   0 4.447538e-01          7900
## 80517                                   0 3.331113e-03          1500
## 122487                                  1 0.000000e+00          2900
## 67935                                   0 4.989788e-01          7833
## 50539                                   0 2.886859e-01          1970
## 67154                                   0 5.011015e-01          5900
```

```
## 54813                                    0 7.332356e-02          7500
## 52658                                    0 1.512487e-01          5685
## 134119                                   0 4.452941e-01          6799
## 9443                                     0 2.734906e-01          2500
## 3747                                     0 5.423897e-01          2016
## 61376                                    0 9.373814e-01          1580
## 116305                                   0 2.199560e-02          5000
## 53879                                    2 2.538071e-02          6500
## 70324                                    0 1.506483e-01          4858
## 148548                                   0 6.947579e-01          7000
## 5829                                     0 6.882635e-01          4583
## 86013                                    1 1.933317e-01          8187
## 30709                                    0 8.963862e-02          7083
## 98712                                    0 2.502629e-01           950
## 104601                                   0 1.762107e-01          5884
## 66969                                    0 2.091318e-01          6000
## 74474                                    0 2.401934e-01          5582
## 1997                                     0 1.170336e-01           862
## 24862                                    0 8.049738e-02          4583
## 145047                                   0 5.705109e-01          3424
## 86885                                    0 8.067197e-01          5535
## 101024                                   0 2.165341e-01          2890
## 107100                                   0 5.941873e-01          5573
## 143930                                   0 2.020681e-01          2320
## 54026                                    0 3.756561e-01          4000
## 138837                                   0 6.129032e-02           929
## 61407                                    0 9.120000e+02             0
## 18017                                    1 6.526807e-01          8150
## 83752                                    0 1.843625e-01          2250
## 62959                                    0 1.463089e-01          6000
## 126215                                   0 4.919900e-01          5180
## 119773                                   0 2.712000e+03             0
## 137805                                   0 6.949072e-02          2100
## 60430                                    0 1.228407e+00           520
## 64532                                    0 8.110332e-01          3280
## 71462                                    0 2.662446e-01          3000
## 96433                                    0 2.302298e-01          7700
## 1083                                     0 9.052409e-02          5666
## 71858                                    1 3.530650e-01          3800
## 22615                                    0 1.876372e-01          2733
## 118791                                   0 6.209282e-01          7950
## 148356                                   0 8.246965e-01          3376
## 134595                                   0 2.199511e-02          4500
## 109914                                   0 1.640369e-01          6400
## 53297                                    0 0.000000e+00          4166
## 26210                                    0 6.113412e-02          7000
## 129243                                   0 2.191116e-01          7000
## 61974                                    0 3.544702e-01          3500
## 136157                                   1 2.817541e-02          4400
## 47223                                    0 4.631355e-01          6116
## 115057                                   0 3.362773e-01          6000
## 147399                                   0 2.190970e-01          1350
## 40322                                    1 2.162548e-01          7000
## 148901                                   0 5.540811e-01          5500
```

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## 15311                                    0 2.350081e-02          3701
## 92644                                    0 4.513727e-02          4297
## 137193                                   0 3.591042e-01          3750
## 3614                                     0 3.103358e-01          7623
## 70104                                    0 4.292453e-01          2331
## 129752                                   0 3.614604e-01          6600
## 36373                                    0 6.109541e-01          2829
## 15108                                    0 5.122799e-01          4600
## 66502                                    2 3.635107e-01          5787
## 46092                                    0 1.508492e+00          1000
## 1162                                     0 3.488868e-01          7500
## 121057                                   0 9.721311e-01          3049
## 112232                                   0 5.630652e-01          4201
## 101382                                   0 1.649588e-02          4000
## 53325                                    3 1.732392e-01          6516
## 19470                                    0 9.170380e-02          5833
## 28449                                    0 3.830123e-01          6333
## 12069                                    0 5.062446e-01          8086
## 51864                                    0 1.702030e-01          2167
## 60061                                    0 3.743353e-01          2820
## 127849                                   0 1.999334e-03          3000
## 130581                                   0 9.561060e-03          2300
## 14389                                    0 9.060612e-02          4800
## 124485                                   0 2.795699e-02           929
## 125356                                   0 5.624792e-01          3000
## 134836                                   0 4.635073e-01          5000
## 32032                                    0 1.762840e+00          2900
## 135103                                   1 2.667809e-01          3500
## 2654                                     0 1.343785e-02          6250
## 129169                                   0 5.366252e-01          4900
## 28646                                    1 1.762637e-01          5400
## 51121                                    0 2.500619e-01          4038
## 130969                                   0 4.199417e-01          7200
## 71191                                    0 4.249007e-01          4280
## 148889                                   0 2.099475e-01          4000
## 31930                                    0 3.837864e-01          8350
## 9679                                     0 3.431085e-01          3750
## 47351                                    0 0.000000e+00          1220
## 119258                                   0 3.008159e-01          2818
## 10683                                    0 4.339258e-01          5175
## 148633                                   0 2.351812e-01          8333
## 23072                                    1 4.836092e-01          6283
## 138920                                   0 1.011625e+00          4300
## 133244                                   0 1.063611e-01          7765
## 90248                                    0 1.492515e+00          1335
## 99620                                    0 6.800000e+02             0
## 88565                                    0 2.435513e-01          5000
## 54306                                    0 4.760771e-03          8401
## 120321                                   0 9.131262e-02          6307
## 24733                                    0 3.911218e-01          5000
## 134002                                   0 2.395000e+03             0
## 66083                                    0 4.105298e-01          3000
## 12413                                    0 5.329949e-02          4333
## 25802                                    0 3.809598e-01          6375
```

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## 33546                                    0 1.932930e-01          6440
## 28084                                    0 7.813938e-01          6083
## 11425                                    0 1.279302e+00           400
## 56159                                    0 5.867014e-02          2300
## 10250                                    0 1.220107e-01          8613
## 8726                                     0 2.570694e-03          3500
## 149398                                   0 8.008766e-01          3193
## 2305                                     0 6.427653e-03          7000
## 48036                                    0 4.570950e-01          7166
## 36433                                    0 3.818654e-01          8083
## 105217                                   0 1.419830e-01          7190
## 40487                                    0 6.079027e-03          6250
## 51759                                    0 1.101000e+03             0
## 106561                                   0 2.621653e-01          6945
## 34316                                    0 2.750145e-01          5166
## 99196                                    0 1.155658e+00          1740
## 124613                                   0 6.943714e-02          1900
## 71396                                    0 1.806713e-01          4200
## 47301                                    1 3.809456e-01          7000
## 132907                                   0 2.668606e-01          5500
## 28898                                    0 3.972474e-01          8500
## 107190                                   0 3.200840e-01          6666
## 42663                                    0 3.875405e-01          7415
## 58025                                    0 5.091683e-01          6816
## 98801                                    0 2.365140e-01          8100
## 48214                                    0 2.221840e-01          5814
## 85159                                    0 6.907098e-01          3465
## 122621                                   0 1.676511e-01          2200
## 143330                                   0 4.664275e-02          1950
## 136471                                   0 4.340132e-01          3333
## 126926                                   0 1.858429e-01          8108
## 130491                                   0 1.116161e-01          5500
## 98197                                    0 2.563770e-04          7800
## 29565                                    0 4.444172e-01          4083
## 142061                                   0 4.954761e-01          2320
## 18642                                    0 1.739768e-01          7500
## 102208                                   0 6.825135e-03          4248
## 18078                                    1 4.554171e-01          2085
## 95355                                    0 2.938236e-01          6200
## 128497                                   0 9.757674e-02          3094
## 96235                                    0 3.048499e-01          3030
## 102318                                   0 7.461140e-02          2894
## 146073                                   0 4.765565e-01          1300
## 89951                                    0 3.911729e-01          6615
## 59543                                    0 2.281930e-01          4000
## 102306                                   0 5.210981e-01          5900
## 22828                                    0 1.979340e-01          3000
## 88184                                    0 7.041547e-01          5583
## 3617                                     0 4.232884e-01          2000
## 40065                                    0 3.683928e-01          5580
## 104871                                   0 2.931291e-01          4700
## 77171                                    0 3.715596e-01          4359
## 87436                                    0 8.650833e-01          4083
## 129978                                   0 1.799600e-02          4500
```

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## 24209                                    1 3.151712e-01          4000
## 50823                                    0 6.547465e-01          8500
## 141028                                   1 4.856699e-01          4500
## 36376                                    0 9.419750e-01          4566
## 25913                                    0 9.947513e-02          4000
## 15016                                    0 9.030801e-03          6200
## 64762                                    0 1.039792e-01          5000
## 80558                                    0 1.010128e+00          1875
## 36251                                    0 2.896947e-01          7500
## 93315                                    0 3.712052e-01          5500
## 64837                                    0 3.149466e-01          2247
## 133294                                   0 2.190421e+00           855
## 62229                                    0 8.525307e-01          4800
## 145483                                   0 5.962914e-02          8250
## 16305                                    0 4.563943e-01          2900
## 66022                                    2 4.021708e-01          3500
## 8831                                     0 6.596708e-01          2429
## 123674                                   0 2.609661e-02          1800
## 46467                                    0 8.685462e-01          2943
## 133562                                   0 6.810302e-01          8075
## 123327                                   0 1.996800e-01          6875
## 113680                                   0 2.426343e-02          1730
## 14862                                    0 8.541011e-01          5400
## 145677                                   0 6.775162e-01          4331
## 77433                                    0 4.461756e-01          4941
## 68576                                    2 7.486503e-01          3333
## 74867                                    0 5.093214e-01          4022
## 70891                                    0 1.921010e-01          8000
## 118510                                   1 5.689682e-02          6502
## 45378                                    0 2.074925e+00          1000
## 27615                                    0 2.235472e-01          6624
## 149996                                   0 2.251309e-01          2100
## 70399                                    0 5.121774e-01          2750
## 82599                                    0 4.483402e-01          7500
## 31692                                    0 7.076132e-01          7000
## 120241                                   0 3.766602e-01          6700
## 7002                                     0 9.102548e-02          7810
## 100364                                   0 6.154689e-01          8209
## 66472                                    0 1.762516e-01          7250
## 111519                                   0 2.382584e-01          4960
## 15406                                    0 2.181425e-01          8333
## 114428                                   0 5.443371e-01          3416
## 36219                                    0 7.422492e-01          6579
## 55478                                    0 5.970441e-01          4600
## 141238                                   0 3.195783e-01          5500
## 128824                                   0 6.047198e-01          2033
## 15767                                    0 4.818379e-01          3220
## 113715                                   0 4.161115e-01          6454
## 141058                                   0 4.492636e-01          7400
## 140718                                   1 2.901224e-01          5800
## 142591                                   1 2.628184e-01          3100
## 32810                                    2 4.375000e-01          2095
## 8482                                     0 7.847663e-01          3465
## 108855                                   0 1.551363e-01          6200
```

```
## 99140                                    0 4.225537e-01          6100
## 64709                                    1 6.858017e-02          8500
## 26521                                    0 7.205640e-01          6666
## 138556                                   0 4.640059e-01          4083
## 145777                                   0 3.453958e-01          3094
## 117626                                   0 3.889092e-01          2740
## 124319                                   0 4.815565e-01          7400
## 70663                                    0 3.364424e-01          1500
## 124772                                   0 1.126516e-01          4038
## 25733                                    0 9.356650e-01          3916
## 135692                                   1 4.039174e-01          5666
## 63689                                    0 8.241892e-02          4100
## 98481                                    0 1.561985e-01          4250
## 120495                                   0 2.757155e-01          8000
## 83656                                    0 4.598101e-01          4316
## 87843                                    0 3.129964e-01          2769
## 31136                                    0 6.846577e-02          2000
## 3105                                     0 2.692016e-01          6600
## 129557                                   0 7.763898e-01          1600
## 80285                                    0 2.032285e-01          8300
## 41093                                    0 4.768846e-01          2400
## 73633                                    0 4.512121e-01          3299
## 57680                                    0 0.000000e+00          8125
## 60529                                    0 1.009352e-01          3100
## 74599                                    1 2.420929e-01          2560
## 70931                                    0 5.152475e-01          6000
## 148678                                   0 9.197940e-03          5435
## 102743                                   0 1.485536e-01          2557
## 106085                                   0 2.979062e-01          8166
## 134147                                   0 3.138338e-01          6700
## 149883                                   0 7.145000e+02             1
## 119225                                   0 1.399720e-03          5000
## 72035                                    0 3.767113e-01          6500
## 103802                                   1 2.924943e-01          7500
## 49154                                    0 1.090161e-01          2916
## 115590                                   1 2.986716e-01          7000
## 126658                                   0 9.953775e-01          3893
## 4667                                     0 2.324419e-01          4000
## 83153                                    0 7.737875e-02          2700
## 72373                                    0 5.269735e-01          4800
## 104336                                   0 0.000000e+00          3012
## 65716                                    0 3.421879e-01          3500
## 5805                                     0 1.067173e+00          2500
## 91472                                    0 4.767581e-02          7550
## 63232                                    0 1.056841e-01          3500
## 99238                                    0 2.961341e-01          5250
## 8414                                     0 4.568433e-01          5340
## 145609                                   0 2.955763e-01          5040
## 132799                                   0 2.215297e-01          7700
## 25430                                    1 2.326656e-01          1946
## 50790                                    0 4.028657e-01          3000
## 5916                                     0 4.216066e-01          8265
## 59943                                    0 5.104783e-01          6250
## 90137                                    0 2.053612e-01          2200
```

```
## 45421                                    0 5.717781e-01          1225
## 128728                                   2 3.361106e-01          6000
## 144431                                   0 1.197007e-01           400
## 28438                                    0 1.639344e-02           670
## 141497                                   0 2.701972e-03          3700
## 136380                                   0 1.212516e-01          2300
## 140340                                   0 1.263747e-01          5000
## 15224                                    0 9.991674e-03          1200
## 107443                                   0 8.380787e-01          4600
## 111575                                   0 2.417405e-02          2481
## 4734                                     0 5.389395e-02          6920
## 14704                                    1 8.168739e-01          4100
## 105703                                   0 2.737684e-01          5500
## 48506                                    0 3.599280e-03          3333
## 45606                                    0 2.267684e-01          2883
## 52687                                    0 1.030493e+00          3672
## 27763                                    0 8.971206e-01          3333
## 7483                                     0 5.522577e-01          3166
## 24887                                    0 2.694551e-01          6000
## 89774                                    1 3.247351e-01          5000
## 64394                                    1 5.091864e-01          2666
## 62608                                    0 3.459716e-01          8650
## 125587                                   2 2.089532e-01          7527
## 66125                                    0 2.140000e+02             0
## 6345                                     0 8.993817e-03          5336
## 80097                                    0 3.046376e-01          3600
## 85102                                    0 6.046743e-01          4021
## 85530                                    0 3.776938e-03          4500
## 103259                                   0 3.918611e-01          5700
## 107375                                   0 4.790025e-01          8500
## 91729                                    0 4.170205e-01          5416
## 138298                                   0 4.906778e-01          5738
## 38578                                    0 6.419450e-01          2035
## 17124                                    0 5.588003e-01          2533
## 97418                                    0 6.631212e-02          6016
## 68500                                    5 9.600069e-01          5800
## 100885                                   0 3.065531e-01          2700
## 53107                                    0 4.442706e-01          5750
## 37017                                    0 1.838868e-01          4877
## 84268                                    0 3.340918e-01          4833
## 137200                                   0 4.687316e-01          5100
## 142168                                   0 1.722356e-01          5416
## 67249                                    0 9.389014e-01          6644
## 15852                                    0 8.636545e-02          2500
## 93844                                    0 5.595615e-01          4104
## 28851                                    0 2.153515e-03          6500
## 108011                                   0 2.526105e-01          4500
## 79300                                    0 1.923077e+00          1000
## 96323                                    0 4.320877e-01          5565
## 84975                                    0 1.157981e+00          3050
## 77886                                    0 1.173547e+00          2615
## 33269                                    0 2.113821e-01          3443
## 43734                                    0 3.432189e-02          3000
## 90977                                    0 3.809456e-01          7000
```

```
## 86770                                    0 1.162946e-01          3000
## 6431                                     0 4.574398e-01          7600
## 12319                                    0 1.562719e+00          2000
## 9830                                     0 1.748531e-01          8000
## 115235                                   0 2.317321e-02          5911
## 145360                                   0 3.204555e-01          2458
## 133215                                   0 2.026216e-01          4500
## 66021                                    0 1.088341e-01          5025
## 24543                                    0 6.483365e-01          5800
## 87827                                    0 1.748907e-02          1600
## 67624                                    0 2.558703e-01          6600
## 25840                                    0 3.688824e-01          4106
## 33759                                    0 9.034891e-01          4900
## 32736                                    0 8.730025e-01          3566
## 110230                                   0 2.744193e-01          6500
## 20875                                    1 9.638554e-01          3900
## 87507                                    0 8.974359e-02          7955
## 142320                                   0 3.184804e-01          3500
## 67022                                    0 2.089535e-01          8666
## 71105                                    0 3.992501e-01          7200
## 61976                                    0 6.281614e-02          8500
## 72559                                    1 4.794082e-01          2500
## 105742                                   0 2.192963e-01          4518
## 31442                                    1 2.491686e+00          2946
## 60440                                    0 3.821236e-01          5000
## 57220                                    0 4.850874e-02          5833
## 1699                                     0 1.042791e+00          5000
## 90790                                    0 5.820035e-01          2255
## 129261                                   0 3.558886e-01          4270
## 97575                                    3 4.429446e-01          8000
## 89800                                    0 2.565657e-02          4949
## 147528                                   0 9.996002e-03          2500
## 145159                                   0 6.174811e-01          6200
## 79284                                    0 3.475363e-02          4200
## 27351                                    0 3.398058e-01          1750
## 97667                                    0 1.612751e-01          8500
## 95169                                    0 5.021991e-01          2500
## 145699                                   0 8.398320e-02          5000
## 131351                                   0 4.180895e-01          6500
## 2661                                     0 5.518528e-02          3750
## 126808                                   0 5.158351e-01          2304
## 131878                                   0 5.229885e-01          4175
## 141006                                   0 3.025994e-01          4500
## 89731                                    0 1.636546e-01          2987
## 91222                                    0 4.007577e-01          4750
## 36494                                    0 1.987329e-01          7733
## 9290                                     0 1.019758e-02          3137
## 4707                                     2 2.847758e-01          3500
## 57197                                    0 3.278307e-01          4300
## 21544                                    2 4.487892e-01          4500
## 111281                                   0 2.033781e-02          2900
## 94532                                    0 4.931169e-03          4866
## 11343                                    0 3.634339e-01          8083
## 145466                                   0 1.683696e-01          2250
```

```
## 139689                                    1 8.460454e-03          7800
## 83688                                     0 8.672959e-01          1800
## 117935                                    4 5.654380e-01          6700
## 33762                                     1 4.245651e-01          6667
## 99745                                     0 3.098451e-02          2000
## 88106                                     1 3.452518e-01          2600
## 106753                                    0 9.460654e-02          7916
## 83395                                     0 1.753782e+00          1916
## 75118                                     0 2.570929e-01          8000
## 62140                                     0 4.525862e-01          3943
## 102326                                    1 6.037216e-01          1450
## 116732                                    0 3.711559e-01          6600
## 31002                                     0 1.352378e-01          7630
## 45403                                     0 1.488834e-02          2417
## 50155                                     0 0.000000e+00          2217
## 125844                                    0 4.141953e-01          3000
## 49020                                     0 1.901719e-01          6572
## 44512                                     0 2.564672e-01          7653
## 8931                                      1 2.911828e-01          2324
## 140192                                    0 4.582196e-01          7694
## 59547                                     0 1.219255e+00          3032
## 148486                                    0 5.562958e-01          1500
## 43453                                     0 2.880000e+02             0
## 15256                                     0 7.294768e-01          2350
## 8306                                      0 1.368631e-01          1000
## 126501                                    0 3.481185e-01          5500
## 37929                                     0 6.368886e-02          5887
## 136210                                    0 4.857857e-01          3200
## 132639                                    0 4.236166e-03          3776
## 108994                                    1 8.013519e-01          2662
## 23144                                     0 1.738373e-01          5740
## 66648                                     0 2.379763e-01          1600
## 57702                                     0 3.489264e-01          2607
## 55170                                     0 1.841953e-01          5200
## 113197                                    0 2.558666e-01          3536
## 98352                                     1 3.173968e-01          5500
## 144532                                    3 2.616182e-01          5400
## 7210                                      0 1.871401e-01          2083
## 137681                                    0 5.182390e-01          1589
## 103729                                    0 9.773124e-02          4583
## 88963                                     0 1.224694e-02          4000
## 145980                                    3 8.485456e-02          4984
## 112236                                    0 5.137030e-01          6275
## 96292                                     0 8.432358e-02          4375
## 76561                                     0 9.460245e+00          2200
## 7880                                      0 1.127714e-03          7093
## 92058                                     0 8.133165e-02          4745
## 58949                                     0 5.741379e-01          1739
## 61491                                     0 1.935484e-01          6075
## 37459                                     0 1.366432e-01          6666
## 87817                                     0 2.223569e-01          3300
## 9308                                      0 7.636182e-01          2000
## 92277                                     0 2.379524e-02          5000
## 78085                                     0 9.316065e-02          4400
```

```
## 135903                                    1 6.607930e-03          907
## 119512                                    0 8.652822e-01         5633
## 33428                                     0 3.515297e-01         5000
## 5154                                      0 2.138390e-02         4956
## 34752                                     0 2.337211e-01         5758
## 63286                                     0 5.123577e-01         3600
## 93829                                     0 4.658311e-01         3350
## 131399                                    0 3.978863e-01         3500
## 102373                                    0 3.545095e-01         4800
## 139049                                    0 1.133000e+03            0
## 60035                                     0 0.000000e+00          820
## 15144                                     0 1.893018e-01         6000
## 70018                                     0 4.317774e-01         4455
## 68693                                     0 6.731090e-01         3000
## 16449                                     0 2.866912e-01         1900
## 77336                                     0 7.593210e-02         6597
## 91681                                     0 0.000000e+00         1600
## 58246                                     0 4.393902e-01         4000
## 78167                                     0 1.289265e-01         7926
## 99377                                     0 4.802852e-01         2383
## 548                                       0 5.341821e-01         3612
## 99933                                     0 1.199891e-02         3666
## 11915                                     0 1.398003e+00          700
## 91691                                     0 8.584488e-02         7000
## 115069                                    0 2.938085e-01         7800
## 148084                                    0 5.123619e-01         1900
## 68783                                     0 5.658606e-01         3514
## 21066                                     0 1.601993e-01         3813
## 101892                                    0 5.355184e-01         7840
## 131678                                    0 2.253869e-01         4458
## 65856                                     0 5.183727e-01         5333
## 45381                                     0 1.539560e-01         3500
## 1501                                      0 4.455554e-01         8200
## 103093                                    1 9.052023e-01          864
## 74131                                     0 1.437320e-02         8000
## 77022                                     0 3.563867e-02         2833
## 61187                                     0 5.446015e-01         7992
## 57607                                     0 3.799240e-03         5000
## 53014                                     0 3.163554e-01         1766
## 74293                                     0 4.246723e-01         6484
## 40721                                     1 3.476150e-01         3500
## 44731                                     1 1.688514e-01         4500
## 4984                                      0 2.708681e-01         6600
## 79293                                     0 3.232637e-01         7083
## 108410                                    0 3.310000e+02            0
## 45036                                     0 4.321602e-01         8239
## 22260                                     0 1.319001e-01         1720
## 106047                                    0 4.057971e-01         2000
## 93212                                     2 1.237976e+00         1600
## 42174                                     1 3.076394e-01         4358
## 94208                                     0 3.332920e-01         8073
## 93066                                     0 1.643162e-02         7728
## 73207                                     0 3.914021e-01         4000
## 105738                                    0 8.287293e-03          723
```

```
## 81454                                    0 2.403798e-01          2000
## 19449                                    0 2.815111e-01          5505
## 120152                                   0 3.981503e-01          4216
## 142165                                   0 6.473852e-02          5946
## 2245                                     0 3.559061e-01          5197
## 33126                                    0 1.307035e-01          5500
## 13223                                    2 1.110234e-01          3800
## 37463                                    0 4.121077e-01          3600
## 100352                                   0 3.336502e-01          7363
## 106764                                   0 3.801240e-01          5000
## 127747                                   0 5.958088e-02          7300
## 107282                                   0 5.031566e-01          1583
## 45116                                    0 1.688265e-01          8333
## 58848                                    0 2.899420e-01          5000
## 1861                                     0 0.000000e+00          4000
## 53696                                    0 0.000000e+00          6601
## 103922                                   2 4.992475e-01          7308
## 42006                                    0 4.746820e-01          8333
## 142013                                   0 4.069098e-01          2083
## 109810                                   0 7.070419e-02          7000
## 78720                                    0 6.547900e-01          5500
## 6275                                     0 9.317138e-02          6750
## 87211                                    1 5.560507e-01          2916
## 89705                                    0 3.309885e-01          2700
## 133148                                   0 1.173598e-01          7165
## 106374                                   0 1.875919e-01          3400
## 102069                                   0 4.380566e-01          6400
## 21296                                    0 3.551132e-01          5876
## 50327                                    0 1.791713e-01          6250
## 3834                                     2 3.250389e-01          4500
## 125798                                   0 1.130242e-01          3600
## 132429                                   0 7.489032e-01          7749
## 144312                                   0 4.101573e-01          3878
## 10356                                    0 6.028393e-01          5916
## 46423                                    0 2.995038e-01          6650
## 98094                                    0 8.568980e-03          3500
## 71426                                    0 2.781968e-01          5833
## 74180                                    0 6.679046e-01          7000
## 147927                                   0 4.204305e-01          5667
## 61883                                    0 4.620224e-01          8583
## 118717                                   0 2.874934e-01          5700
## 119239                                   0 5.616858e-01          3914
## 2903                                     0 3.711170e-01          3025
## 56682                                    0 7.156160e-01          4187
## 71737                                    0 6.245636e-01          3150
## 59986                                    0 7.109531e-03          4500
## 74015                                    0 3.112334e-01          7450
## 15395                                    0 1.206092e+00          2100
## 31837                                    1 3.476122e-01          8333
## 40536                                    0 7.012064e-01          4641
## 66396                                    0 4.873141e-01          8000
## 7040                                     0 7.255788e-01          7083
## 46137                                    0 5.579211e-01          4790
## 120428                                   0 4.376406e-01          4000
```

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## 53812                                    0 5.392140e-01          5724
## 90431                                    0 1.522000e+03             0
## 96765                                    0 2.463768e-01          2000
## 146042                                   0 1.993068e-01          7500
## 1159                                     0 4.375000e-01          4079
## 36138                                    0 5.625828e-01          5280
## 106613                                   0 2.493766e-03           400
## 101788                                   0 3.113000e+03             0
## 111064                                   0 2.278549e-01          7416
## 38172                                    4 7.541780e-01          7000
## 96032                                    0 6.735219e-01          3500
## 134614                                   0 3.064478e-01          4202
## 121180                                   0 2.142758e-01          7200
## 118181                                   0 1.019052e-02          2256
## 140933                                   0 3.006960e-01          6321
## 35710                                    0 3.742331e-01          4400
## 10161                                    0 2.393780e-01          8166
## 129575                                   0 3.742737e-02          7400
## 21712                                    0 6.953262e-01          4000
## 5746                                     0 3.329584e-01          8000
## 16093                                    0 2.047612e-01          6846
## 38926                                    0 0.000000e+00          4000
## 45994                                    1 1.424644e-02          4000
## 131631                                   0 2.772031e-02          7250
## 137104                                   0 1.763316e-02          5500
## 50364                                    0 9.306139e-01          5000
## 115340                                   0 1.480777e-01          4733
## 143443                                   0 4.344079e-02          5800
## 138833                                   1 1.211758e-01          3333
## 64381                                    0 5.196850e-01          2666
## 140154                                   0 3.170394e-02          8673
## 33686                                    0 3.499125e-03          4000
## 145708                                   4 6.904762e-01          7307
## 67628                                    0 4.067748e-01          7025
## 82603                                    0 1.061313e+00          3000
## 30831                                    0 2.500000e+02             1
## 66307                                    0 2.980570e-02          5300
## 70932                                    0 2.980812e-01          2240
## 40564                                    0 9.793063e-02          3430
## 94371                                    1 4.845331e-01          6917
## 109720                                   0 7.732302e-02          7500
## 111309                                   0 1.804276e-01          5752
## 71414                                    0 1.830206e-01          3250
## 48068                                    0 2.810292e-01          7500
## 95309                                    0 7.709454e-01          1300
## 75926                                    0 9.950083e-01           600
## 136923                                   0 1.650568e-01          5900
## 95168                                    0 2.908033e-03          2750
## 77610                                    0 2.720957e-01          2590
## 84088                                    0 9.675859e-02          6200
## 100607                                   1 3.940493e-01          7998
## 41171                                    1 3.321336e-01          5000
## 36633                                    1 2.019327e-01          3000
## 106610                                   0 1.566145e-01          3000
```

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## 132594                                    0 1.153626e-01          1750
## 85428                                     0 1.336265e+00          2500
## 51925                                     0 4.822362e-01          5741
## 27563                                     0 5.748563e-03          4000
## 22905                                     0 1.885623e+00          5000
## 14718                                     2 7.002193e-01          5016
## 121471                                    0 3.734378e-01          6000
## 148314                                    0 3.019391e-02          3609
## 89793                                     0 1.361800e+00          4800
## 143929                                    0 4.753788e-01          1583
## 73944                                     0 4.592874e-01          8166
## 62304                                     0 4.347086e-01          2350
## 5070                                      0 9.073634e-01           420
## 104396                                    1 2.342299e-01          4200
## 20987                                     0 3.052209e-01          2738
## 136350                                    0 1.827000e+03             0
## 131252                                    0 2.577789e-01          3952
## 129509                                    0 6.252546e-01          5400
## 50322                                     0 8.073695e-01          7625
## 90021                                     0 1.161105e-01          8000
## 16189                                     0 2.586236e-01          6000
## 99090                                     0 3.077955e-01          7452
## 106038                                    0 4.886195e-01          4041
## 146511                                    0 1.036753e-01          7291
## 102453                                    0 5.780711e-01          6666
## 1973                                      0 3.952016e-01          3000
## 74573                                     0 3.900000e+01             1
## 107452                                    0 5.645967e-01          1400
## 99904                                     0 3.219213e-02          5870
## 21249                                     0 8.916561e-01          5500
## 20367                                     0 2.114964e-01          3200
## 77914                                     0 1.153043e-01          5749
## 16607                                     0 6.121820e-04          3266
## 106708                                    0 4.253351e-01          8430
## 59208                                     0 3.771213e-03          1590
## 124568                                    0 1.528585e-03          3270
## 129501                                    0 3.421316e-01          5000
## 23524                                     0 7.131535e-01          7822
## 74397                                     0 7.721393e+00           200
## 65394                                     0 1.284947e-01          7260
## 96203                                     0 3.201700e-01          4000
## 65902                                     0 1.906940e-04          5243
## 6390                                      0 5.580076e-01          4757
## 144746                                    0 9.617252e-01          3500
## 74943                                     0 3.182185e-01          8666
## 106227                                    0 2.878096e-02          7226
## 5713                                      0 1.316703e-01          3166
## 46624                                     0 4.881462e-01          3500
## 75167                                     0 3.503401e-01          5291
## 96998                                     0 6.923736e-01          4667
## 63305                                     0 4.174528e-01          6783
## 42954                                     0 3.648860e-01          3200
## 136230                                    0 9.412078e-02          7500
## 58544                                     0 5.073236e-01           750
```

```
## 148734                                    0 1.888000e+03            0
## 98204                                     0 1.119917e+00         1450
## 61913                                     0 3.496933e-01         7986
## 132631                                    0 1.313934e-01         7800
## 31994                                     0 2.090076e-01         5128
## 72239                                     0 1.230000e+03            0
## 79656                                     0 9.912910e-02         3903
## 89786                                     0 1.530710e-01         2083
## 126981                                    0 1.068589e+00         4300
## 133368                                    1 5.168708e-01         4000
## 107201                                    1 4.638178e-01         8166
## 8517                                      0 1.648954e-01         2916
## 6714                                      0 2.837916e-01         5200
## 18362                                     0 1.322169e-01         4000
## 56355                                     0 2.275090e-01         2500
## 64944                                     0 2.311015e-01         8333
## 58519                                     0 1.742160e-03         3443
## 90649                                     0 1.242345e-01         8000
## 129184                                    0 2.548726e-02         2000
## 44979                                     0 9.905635e-01         3708
## 91608                                     0 4.908199e-02         5500
## 9118                                      0 1.699150e-02         2000
## 59282                                     0 4.372136e-01         3272
## 10823                                     9 1.483160e-01         6620
## 38432                                     0 2.333453e-01         5583
## 143407                                    0 4.685000e+03            0
## 43686                                     0 2.214464e+00          400
## 34794                                     0 3.146370e-01         7808
## 102854                                    0 3.626601e-01         2420
## 123267                                    0 3.890000e+02            1
## 52868                                     0 6.655978e-01         2182
## 31201                                     0 2.437513e-01         5000
## 100908                                    0 2.017611e-01         2611
## 64717                                     0 7.450980e-01         2600
## 129130                                    0 4.298567e-01         3000
## 110360                                    0 3.913198e-02         2810
## 106916                                    0 5.179426e-01         5015
## 57739                                     0 8.035982e-01         2000
## 65723                                     0 2.596006e-01          650
## 21185                                     0 3.031742e-01         4000
## 97641                                     0 3.703704e-03         4859
## 90673                                     0 5.619897e-01         6613
## 95610                                     0 2.819957e-01         1382
## 138961                                    0 6.163018e-01         5115
## 12214                                     0 7.233385e-01         1940
## 51843                                     0 2.115846e+00          750
## 104481                                    0 2.891016e-01         7000
## 11669                                     0 2.829780e-01         8300
## 66657                                     0 5.541604e-01         5335
## 136101                                    0 7.342407e-01         5583
## 123487                                    0 2.861451e-01         6300
## 54138                                     0 0.000000e+00         2700
## 96586                                     0 2.572703e+00         1120
## 35105                                     0 2.270382e-02         3875
```

```
## 56187                                    0 6.570088e-01          4900
## 140419                                   0 1.231841e+01           200
## 112585                                   0 2.772031e-01          4833
## 34732                                    0 5.597207e-01          2720
## 114582                                   0 1.847143e-01          6685
## 71321                                    0 1.297596e-02          4700
## 133887                                   0 1.587838e-01          1775
## 81587                                    0 2.158749e-01          4988
## 125886                                   0 2.370000e+02             0
## 90941                                    0 2.310030e-01          8224
## 58059                                    0 1.037068e+00          2400
## 101359                                   0 7.799237e-02          8128
## 73344                                    0 3.917957e-01          7166
## 88987                                    0 7.678464e-02          5000
## 54036                                    0 5.141388e-03          3500
## 58444                                    2 5.474439e-01          5300
## 12144                                    0 3.594015e-01          7083
## 53308                                    0 4.997870e-01          2346
## 84993                                    0 1.587682e-01          5000
## 131330                                   0 7.350449e-01          3894
## 41633                                    0 6.691278e-03          4333
## 43426                                    0 6.685237e-01          4666
## 85347                                    0 4.491939e-01          8000
## 64228                                    4 7.132090e-01          5306
## 38399                                    0 8.526188e-03           820
## 133348                                   0 4.773281e-01          2050
## 78514                                    0 6.136417e-02          4236
## 148613                                   0 4.208041e-01          7834
## 75665                                    0 1.207834e+00          1250
## 118329                                   0 3.916014e-02          6000
## 125279                                   0 2.418202e-01          4614
## 93640                                    0 3.801377e-01          4500
## 96173                                    0 2.285325e-01          2200
## 99230                                    0 1.188380e-02          2271
## 31961                                    0 1.305085e+00          2300
## 94096                                    0 3.264147e+00          5000
## 96420                                    0 1.329588e+00           800
## 19528                                    0 4.897541e-01          7807
## 5887                                     0 6.422645e-01          4097
## 6989                                     0 3.176665e-01          7850
## 138890                                   0 4.799040e-01          3333
## 50623                                    0 6.906547e-01          2000
## 22891                                    0 2.231196e-01          3961
## 86353                                    0 7.971557e-01          2671
## 8603                                     0 1.610695e+00          2000
## 78352                                    0 1.875750e-01          7500
## 111083                                   0 9.650000e+02             0
## 88467                                    0 2.469394e-01          6207
## 141372                                   0 3.680014e-01          5768
## 107906                                   0 3.835044e-01          7892
## 118491                                   0 2.409598e-01          6000
## 108311                                   1 4.896443e-01          7000
## 95191                                    0 9.252423e-02          4333
## 36783                                    0 1.928721e-01          3815
```

```
## 71645                                    1 1.906383e-01          8224
## 83452                                    0 1.189405e+00          2000
## 133859                                   0 1.195113e+00          2700
## 109260                                   0 3.127375e-01          5000
## 111303                                   0 4.909234e-01          3800
## 3162                                     0 5.132819e-01          3500
## 114375                                   0 3.678687e-01          5240
## 25649                                    2 2.203955e-01          4500
## 21181                                    0 2.000000e+00             0
## 70799                                    0 5.240793e-01          6000
## 28562                                    0 3.823123e-01          2170
## 83935                                    3 3.981204e-01          5000
## 19045                                    2 2.610531e-01          4500
## 126435                                   0 1.194101e-01          2101
## 141629                                   0 5.492113e-01          4500
## 126879                                   0 1.112720e-01          4834
## 78398                                    0 5.104542e-01          4160
## 141656                                   0 6.822175e-01          3300
## 9079                                     0 1.051790e-01          5000
## 138731                                   0 6.393054e-01          3800
## 44774                                    0 1.710214e-01          1262
## 53053                                    0 3.268516e-01          4576
## 3212                                     0 9.652790e-02          5500
## 135753                                   0 0.000000e+00          3673
## 37405                                    0 4.992804e-01          7642
## 125247                                   0 6.989341e-03          5722
## 55771                                    0 8.358328e-02          5000
## 135658                                   0 0.000000e+00          2184
## 48567                                    0 3.128644e-01          8060
## 103986                                   0 5.042493e-01          6000
## 128842                                   1 1.301301e-01          3995
## 127376                                   0 2.694481e-02          2300
## 36348                                    0 4.427939e-03          7000
## 142925                                   1 3.666548e-01          2800
## 71233                                    1 1.691657e-01          2600
## 10420                                    0 1.641497e-02          6091
## 10358                                    0 4.083032e-01          5250
## 40470                                    0 2.629124e-01          3000
## 85323                                    0 3.598972e-02          3500
## 56001                                    0 3.819842e-01          5583
## 67011                                    1 1.472515e+00          1800
## 137879                                   0 4.139217e-01          3217
## 37048                                    0 3.458755e-01          4145
## 68539                                    0 1.707622e-02          2400
## 148057                                   0 5.395201e-01          5667
## 123520                                   1 4.015796e-01          6583
## 31364                                    0 7.733638e-01          6569
## 10593                                    0 1.813535e-01          4890
## 58557                                    0 5.040617e-02          4800
## 10143                                    0 6.490877e-01          4000
## 30207                                    0 3.800000e+01             0
## 99823                                    1 6.859406e-01          2524
## 107125                                   0 5.937564e-02          4900
## 59572                                    0 4.341029e-01          5500
```

```
## 148008                                    0 2.738679e-01          5100
## 30694                                     0 6.188096e-01          2200
## 31352                                     3 2.989392e-02          3110
## 97946                                     0 1.377150e-01          7500
## 99371                                     0 6.663441e-01          6200
## 139759                                    0 7.377193e-01          4559
## 86179                                     0 1.792953e-01          7350
## 25443                                     0 1.682953e-01          2762
## 16245                                     0 7.902722e-01          2240
## 115931                                    2 4.608747e-01          3360
## 129572                                    1 5.816753e-01          7890
## 106868                                    0 6.156769e-01          5000
## 87793                                     0 7.691522e-01          4894
## 142532                                    2 2.514872e-01          7900
## 58864                                     0 1.881768e-01          6833
## 85562                                     1 4.313048e-01          8100
## 81301                                     4 2.785443e-01          5000
## 96811                                     0 3.845216e-01          1640
## 82853                                     1 3.086039e-03          8100
## 112543                                    0 6.381621e-03          1566
## 63621                                     0 4.094346e-01          6083
## 114931                                    0 6.136932e-01          2000
## 147181                                    0 2.887778e-01          7600
## 141839                                    0 3.440719e+00           834
## 112832                                    0 4.401362e-01          3816
## 20481                                     0 3.617843e-01          8540
## 131234                                    2 5.179464e-01          2200
## 26734                                     0 4.174738e-01          5058
## 67711                                     0 3.024244e-01          4000
## 58620                                     0 2.000400e+00          7500
## 101402                                    0 2.525048e-01          7884
## 142852                                    0 2.677515e-01          6083
## 26873                                     3 2.233766e+00          1000
## 70209                                     0 1.487881e-02          4166
## 96744                                     1 5.277489e-01          8666
## 63785                                     0 1.762985e-01          4100
## 58893                                     0 1.199520e-03          2500
## 55210                                     0 5.427021e-03          3500
## 133647                                    0 9.323479e-02          7035
## 21739                                     0 4.234534e-01          4800
## 45337                                     1 8.508627e-03          4230
## 6196                                      0 4.920927e-01          2718
## 111939                                    0 4.976051e-01          5636
## 92206                                     0 6.300569e-01          6500
## 73587                                     0 6.491754e-01          2000
## 127253                                    0 2.401427e+00          1541
## 36460                                     0 5.059982e-01          3250
## 93359                                     1 6.845604e-01          6016
## 98820                                     0 2.899034e-02          3000
## 102300                                    0 8.017328e-01          3000
## 98684                                     0 1.236688e-01          4600
## 92804                                     0 4.201859e-01          8500
## 46274                                     0 4.424700e-01          2250
## 1211                                      0 0.000000e+00          3000
```

```
## 62353                                    0 1.112347e-03          6292
## 58201                                    0 9.050224e-02          2010
## 128050                                   0 9.865471e-02          5574
## 122815                                   0 8.003941e-01          3551
## 102319                                   1 4.559635e-03          4166
## 56005                                    1 1.835429e-01          4532
## 35598                                    0 3.290380e-01          4500
## 68677                                    0 2.005351e-01          7100
## 91171                                    0 1.994302e-02          3509
## 108953                                   1 3.996004e-02          1000
## 74974                                    0 1.561406e-01          6000
## 84106                                    0 2.311487e-01          2837
## 124168                                   0 1.882598e+00          1200
## 26581                                    0 5.150231e-01          2595
## 65721                                    1 1.614596e-01          4000
## 129942                                   0 4.939102e-01          5500
## 68617                                    3 5.826835e-01          5000
## 9066                                     0 2.764007e-01          2944
## 116446                                   1 4.855857e-01          6000
## 115129                                   0 5.571554e-02          7986
## 109928                                   0 0.000000e+00          2557
## 14932                                    0 7.986502e-01          8000
## 83446                                    0 4.277861e-01          2000
## 140925                                   0 3.598800e-02          3000
## 79592                                    0 3.614854e-03          3042
## 24485                                    0 8.195584e-02          8650
## 148757                                   0 2.564812e+00          3000
## 132692                                   0 1.670832e-01          2800
## 116427                                   1 1.551625e-01          5200
## 103279                                   0 1.325812e+00          4830
## 77943                                    0 8.000000e+00             0
## 81526                                    0 1.909566e-01          5550
## 117642                                   0 2.893975e-01          3800
## 18754                                    0 2.947711e-01          6750
## 118053                                   0 2.524369e-02          4000
## 22545                                    0 3.463977e-01          1734
## 98452                                    0 5.674740e-01          2600
## 140308                                   1 1.225236e-01          5198
## 94039                                    1 4.091645e-01          6175
## 45179                                    0 1.999500e-03          4000
## 100040                                   2 2.889813e-01          4328
## 35730                                    0 6.976146e-01          7000
## 51515                                    0 1.348589e-01          4500
## 12327                                    0 3.102233e-01          5105
## 113889                                   0 6.366711e-01          6800
## 86119                                    0 7.083073e-01          1600
## 74249                                    0 1.167211e-01          3366
## 144455                                   0 4.097181e-01          5000
## 94190                                    0 2.309230e-01          3000
## 83719                                    0 9.224138e-01          2667
## 47187                                    0 5.717713e-02          2500
## 36706                                    0 5.717776e-01          8595
## 69637                                    0 2.998811e-01          5888
## 115320                                   0 6.390694e-01          4770
```

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## 102595                                    0 2.851697e-01          8394
## 72787                                     0 1.389722e-01          5000
## 130783                                    0 1.826811e+00          1200
## 19847                                     1 3.517287e-01          3007
## 22822                                     0 3.920512e-01          7975
## 50418                                     0 6.697684e-01          4835
## 55720                                     1 4.211158e-01          3333
## 96895                                     0 4.671543e-01          7108
## 104598                                    1 2.022918e-01          2268
## 121789                                    0 3.103537e-01          3872
## 116606                                    1 4.491018e-03          8683
## 59426                                     0 3.583715e-01          6336
## 37715                                     0 3.104217e-01          5833
## 26766                                     0 4.206721e-01          2350
## 19005                                     0 1.238899e-01          2251
## 3670                                      1 3.191694e-02          5200
## 78694                                     0 5.309111e-01          7100
## 135318                                    2 4.028311e-01          4167
## 28485                                     0 9.775605e-03          4500
## 68162                                     0 3.739526e-01          4176
## 87580                                     0 4.581806e-01          3000
## 118479                                    0 5.464553e-02          7630
## 70950                                     0 5.925926e-02          2834
## 25137                                     0 4.034356e-01          7916
## 10908                                     1 9.542153e-01          3166
## 108488                                    0 9.082467e-02          5383
## 17977                                     0 4.692996e-01          3240
## 32200                                     0 1.033269e-01          3125
## 86831                                     1 7.136906e-02          3600
## 49039                                     0 2.860000e+02             0
## 27079                                     0 3.218281e-01          4200
## 93554                                     0 7.855520e-01          2200
## 139702                                    0 5.761259e-01          6416
## 68344                                     0 6.246418e-01          5583
## 99940                                     0 1.818909e-01          6250
## 90593                                     0 5.784184e-02          5272
## 89313                                     0 7.323180e-01          8666
## 110773                                    0 1.796886e-01          7000
## 32641                                     0 6.560731e-01          5474
## 35158                                     0 2.052872e-01          3063
## 39501                                     0 2.372663e-01          1550
## 133601                                    0 0.000000e+00          3600
## 88164                                     0 1.722875e-01          7916
## 148330                                    0 1.999385e-01          3250
## 17529                                     2 4.449938e-02          2426
## 51482                                     4 1.974682e+00          8333
## 67603                                     0 4.331654e-02          8333
## 132157                                    0 3.719954e-01          7862
## 121868                                    0 3.618785e+00          2533
## 93759                                     0 4.750167e-01          1500
## 81835                                     0 1.521881e-01          3061
## 136877                                    0 8.744465e-01          7000
## 15304                                     0 3.555086e-02          2840
## 32642                                     0 8.258355e-02          3111
```

```
## 94287                                    0 2.903453e-01          1418
## 140165                                   0 6.706192e-02          7589
## 81584                                    0 1.342378e-01          2800
## 19967                                    0 5.090766e-01          3800
## 115944                                   0 1.542393e-01          4304
## 89832                                    2 4.933013e-01          5000
## 7556                                     0 9.441265e-01          3668
## 47606                                    0 2.949473e-01          5600
## 120331                                   2 3.401007e-01          6550
## 120400                                   0 1.264320e-01          4800
## 145663                                   0 4.059993e-01          8100
## 64652                                    0 3.371929e-01          3540
## 138939                                   0 2.111680e-01          4100
## 104230                                   0 7.542536e-02          5700
## 16594                                    0 7.414071e-01          8058
## 18569                                    1 2.235421e-01          8333
## 50746                                    0 3.009860e+00          7200
## 62055                                    0 1.708703e-01          4400
## 54787                                    0 6.755345e-01          8231
## 69721                                    1 3.565976e-01          2750
## 122007                                   0 6.841817e-02          1826
## 18071                                    0 2.802399e-01          3000
## 62309                                    0 3.768893e-01          2050
## 29767                                    0 4.037292e-01          7400
## 124112                                   0 5.104167e-01          7871
## 64290                                    0 2.504200e-01          8333
## 78313                                    0 2.480940e-01          8000
## 144079                                   1 4.749836e-01          6115
## 42630                                    1 1.821173e-01          5166
## 100105                                   0 2.539978e-01          5377
## 135280                                   0 8.713703e-01          4166
## 126610                                   0 1.363091e-01          8333
## 27973                                    0 1.018144e-01          6668
## 82679                                    0 3.158201e-01          8583
## 117945                                   2 2.524996e-01          5900
## 81330                                    0 9.320892e-01          1928
## 82899                                    0 0.000000e+00          1262
## 77439                                    0 3.024060e-01          6940
## 109225                                   0 4.886278e-01          4000
## 8247                                     0 8.568935e-01          4583
## 33842                                    0 2.687468e-01          5800
## 33959                                    0 9.783121e-02          4241
## 109582                                   1 3.668682e-01          4134
## 53919                                    0 2.059992e-01          7800
## 39689                                    0 1.133196e-01          8250
## 105607                                   0 1.842105e-01          4673
## 76951                                    0 3.444180e-02          2525
## 39082                                    0 1.935070e-01          2340
## 79711                                    0 9.977827e-02          1352
## 132687                                   0 3.550794e-01          5226
## 10971                                    0 1.662445e-01          7500
## 60709                                    3 2.568982e-02          2101
## 104987                                   0 1.719481e-01          5774
## 81696                                    0 5.872825e-01          5000
```

```
## 10371                                    0 3.029176e-01          5106
## 26531                                    0 2.471726e-01          6100
## 125452                                   0 5.908073e-01          6700
## 65777                                    0 1.620952e+00          2500
## 79956                                    1 1.160736e+00          2500
## 129567                                   1 5.230805e-01          4245
## 77740                                    0 1.439640e-01          4000
## 26651                                    2 7.342928e-01          3612
## 12000                                    0 2.282362e-01          7500
## 77558                                    0 2.504912e-01          2035
## 10711                                    0 8.356808e-01          3833
## 10421                                    0 1.348001e+00          3226
## 4261                                     0 1.256983e-02          7875
## 62004                                    0 6.397441e-03          2500
## 101826                                   0 4.604944e-03          4125
## 36335                                    0 1.199747e-02          4750
## 70313                                    0 2.129870e+00          1000
## 46010                                    0 3.703837e+00           833
## 71962                                    0 1.894537e-03          3166
## 60345                                    1 4.391402e-01          4000
## 82753                                    0 3.435814e-01          7968
## 100729                                   0 1.239504e-02          2500
## 112472                                   0 9.264608e-02          4500
## 20107                                    2 2.941313e-01          8621
## 62062                                    0 5.890042e-01          2600
## 20981                                    0 3.085274e-01          7000
## 43521                                    0 3.704965e-01          3524
## 115456                                   0 2.623422e-01          8000
## 122154                                   0 3.718513e-02          2500
## 124082                                   4 6.417178e-01          4889
## 26983                                    0 1.763727e-01          1802
## 26046                                    1 2.313665e-01          7083
## 52737                                    0 3.455798e-01          5225
## 54396                                    1 8.085612e-03          4204
## 99387                                    0 6.738751e-01          5733
## 6377                                     0 1.184408e-01          3334
## 44133                                    0 5.305352e-02          4240
## 16794                                    0 4.842292e-01          2250
## 26300                                    0 3.494602e-01          2500
## 119014                                   0 3.792415e-02           500
## 98659                                    0 1.469609e+00          1200
## 117301                                   0 5.671545e-01          4645
## 146279                                   0 2.660766e-01          5535
## 114287                                   0 3.017085e-02          2750
## 122044                                   0 5.091171e-01          4167
## 97198                                    0 1.805639e-01          5000
## 37462                                    1 4.806745e-01          6700
## 91564                                    0 1.779522e-01          7900
## 75583                                    0 1.756641e-01          2333
## 125606                                   0 5.925350e-01          4500
## 73438                                    0 2.634989e-01          4166
## 11129                                    0 2.332667e+00          2500
## 461                                      0 2.294361e-01          7500
## 117064                                   2 7.006092e-01          2297
```

```
## 44583                                    0 5.200000e+01             0
## 140979                                   1 4.427673e-01          2384
## 44784                                    0 2.560000e+02             0
## 18312                                    0 6.923487e-01          3750
## 71832                                    1 3.356643e-01          1000
## 56775                                    1 5.417291e-01          2000
## 34169                                    0 6.392395e-03          6100
## 329                                      1 3.188908e-01          7500
## 134669                                   0 4.014394e-01          2500
## 122965                                   0 7.124167e+00          1650
## 74071                                    0 4.155169e-01          5000
## 130677                                   1 2.818157e-01          3700
## 49430                                    0 7.818606e-01          3428
## 147522                                   0 3.713188e-01          5466
## 27254                                    0 4.873025e-01          5000
## 129066                                   0 7.196873e-01          5500
## 3232                                     0 3.389328e-01          7083
## 67205                                    0 5.453794e-01          6048
## 76027                                    0 4.546627e-01          4653
## 109176                                   0 6.354117e-01          2100
## 111302                                   0 6.209895e-01          3334
## 101854                                   1 5.949883e-02          8100
## 132285                                   0 2.418226e-01          7000
## 41312                                    0 1.438094e-01          6000
## 149148                                   1 6.209516e-01          2500
## 48477                                    0 1.316855e-01          6917
## 36278                                    0 0.000000e+00          3100
## 76404                                    0 1.634465e-01          5744
## 27927                                    0 3.730644e-01          4907
## 140969                                   0 2.897039e-01          8342
## 135625                                   0 2.645740e-01          2452
## 61197                                    0 3.379978e-01           928
## 35455                                    0 8.197268e-02          3000
## 54576                                    0 2.702164e-01          6516
## 33554                                    0 7.130956e-01          3000
## 112698                                   0 3.249590e-01          7920
## 48675                                    0 1.023600e-02          7033
## 17438                                    0 2.155981e-01          2666
## 24174                                    0 1.909364e-01          3000
## 59892                                    1 1.064416e+00          2250
## 145824                                   2 1.595376e-01          3459
## 101931                                   0 1.129080e-01          3400
## 26259                                    3 9.286339e-02          8000
## 83051                                    0 3.587283e-01          5000
## 140578                                   0 6.907835e-02          5500
## 126413                                   0 5.487898e-01          3924
## 135468                                   0 7.570441e-01          1880
## 11661                                    0 9.473492e-03          5488
## 116595                                   0 2.836033e-01          3518
## 75932                                    1 3.244351e+00          5000
## 102539                                   0 1.527480e-01          1400
## 136649                                   1 4.364807e-01          2329
## 35661                                    0 2.147232e-01          8000
## 89982                                    0 3.425479e-01          8500
```

```
## 55738                                    0 2.816537e-01          1160
## 82445                                    0 4.352608e-01          6000
## 13899                                    0 1.156320e+00          2673
## 16826                                    0 6.568803e-01          7833
## 59907                                    0 9.417309e-01          3500
## 72997                                    0 3.511339e-01          4100
## 8771                                     0 1.152458e-01          3600
## 46855                                    0 3.999445e-02          7200
## 63113                                    0 6.542670e-01          2741
## 92538                                    0 2.043634e-01          3620
## 81451                                    0 3.358925e-01          4167
## 10441                                    0 2.151308e-01          6000
## 119163                                   0 9.553631e-01          1500
## 22518                                    1 4.098829e-01          3500
## 90117                                    0 4.719056e-01          5000
## 58873                                    0 6.094635e-01          3000
## 87072                                    0 2.766052e-01          4500
## 105549                                   0 1.921516e-02          3694
## 85655                                    0 2.110340e-01          8500
## 142523                                   0 5.243171e-01          1500
## 66457                                    0 8.424366e-02          5400
## 122565                                   0 3.493844e-01          6416
## 53477                                    1 2.050157e-01          4784
## 5184                                     0 4.622083e-01          6085
## 63062                                    0 1.029031e-01          6957
## 26887                                    1 9.486482e-02          6250
## 21105                                    0 4.818420e-01          2670
## 71390                                    1 1.137735e-01          5800
## 37901                                    0 5.271480e-04          7587
## 132897                                   0 4.190412e-01          7404
## 101170                                   0 1.394793e-01          4186
## 35135                                    1 4.810496e-01          6516
## 149699                                   0 3.813859e-01          3953
## 28963                                    0 1.021000e+03             0
## 111179                                   0 2.239440e-01          4000
## 23838                                    0 1.247750e-01          5000
## 4012                                     0 4.845661e-01          3433
## 74676                                    0 5.371809e-01          1801
## 47633                                    0 3.289589e-01          8000
## 54668                                    0 1.003030e-01          6270
## 48348                                    0 1.051910e+00          4083
## 80634                                    0 1.210479e-01          7748
## 48619                                    2 3.688024e-01          4416
## 109430                                   1 4.574846e-01          5350
## 3436                                     0 5.895439e-01           898
## 97578                                    1 3.979432e-01          7000
## 134220                                   0 2.630857e-01          5100
## 71870                                    0 9.915000e+02             1
## 16054                                    1 4.013569e-01          5600
## 83578                                    0 2.132675e-01          7295
## 101394                                   0 6.198760e-03          5000
## 96610                                    1 7.260173e-01          4054
## 87217                                    0 7.828412e-01          4300
## 104433                                   0 2.973362e-01          4166
```

```
## 18155                                    1 8.711615e-01          4493
## 69850                                    0 5.513493e-01          2667
## 125902                                   0 2.482858e-01          5541
## 113278                                   0 6.338785e-01          4279
## 59273                                    0 1.357642e+00          1000
## 16320                                    0 8.239737e-01          3044
## 134329                                   0 9.148569e-01          2900
## 53322                                    0 3.688770e-01          3000
## 143953                                   0 1.916000e+03             0
## 44443                                    0 3.112111e-01          8000
## 3498                                     0 1.101559e+00          2500
## 8356                                     0 1.047665e+00          2076
## 84142                                    0 3.836527e-01          2556
## 7294                                     0 3.503419e-01          1900
## 57771                                    0 3.597265e-01          4533
## 40039                                    0 1.291379e-01          2748
## 89025                                    1 6.332014e-01          4800
## 102495                                   0 7.918601e-01          2800
## 59231                                    0 3.415485e-01          4300
## 135139                                   0 1.399533e-02          3000
## 691                                      0 3.787103e-02          2930
## 109108                                   0 1.694159e+00          3115
## 139976                                   0 1.691323e-01          2500
## 55797                                    0 1.896369e-01          5673
## 7287                                     2 7.043725e-01          6700
## 104691                                   0 3.923547e-01          3766
## 101401                                   0 0.000000e+00           690
## 105448                                   0 7.761492e-02          3001
## 120903                                   0 5.333333e-01          1124
## 43772                                    0 5.646060e-01          3768
## 80784                                    0 4.411765e-02          2243
## 39390                                    0 2.142551e-03          7000
## 45888                                    0 2.599504e+00          2416
## 33859                                    0 3.001273e-01          5500
## 124513                                   0 1.574606e-02          4000
## 59903                                    0 5.811540e-01          2408
## 126731                                   0 3.917217e-01          3333
## 76841                                    0 1.039007e+00          7972
## 94462                                    1 3.576983e-01          4500
## 66020                                    0 2.645486e-01          3178
## 136459                                   0 5.017549e-01          7407
## 74211                                    0 3.884774e-01          3644
## 47995                                    0 1.108575e-01          6133
## 126549                                   0 0.000000e+00           530
## 98140                                    0 3.908046e-01          2000
## 39404                                    0 4.660103e-01          6398
## 116829                                   1 5.673450e-01          8500
## 78839                                    0 2.952936e-01          2400
## 148343                                   1 6.151724e-01          6524
## 97278                                    0 6.559020e-01          3591
## 3497                                     0 1.595000e+03             0
## 40275                                    0 3.386657e-01          5500
## 86779                                    0 1.715657e-01          5000
## 8013                                     0 1.039861e-02          7500
```

```
## 84086                                    5 3.752321e-01          7000
## 137165                                   0 3.542564e-01          7200
## 30380                                    0 9.689397e-01          2800
## 97133                                    0 3.479072e-01          3750
## 87133                                    0 2.767092e-01          6186
## 135175                                   0 4.798027e-01          7500
## 104594                                   0 1.499625e-03          4000
## 126233                                   0 1.782265e-01          6833
## 74502                                    0 2.537491e-01          4200
## 79170                                    0 2.812985e-01          6437
## 30475                                    0 3.624490e-01          6124
## 142537                                   0 2.852883e-01          3017
## 66501                                    0 3.879224e-02          5000
## 122642                                   0 4.270133e-01          5500
## 47529                                    0 9.488212e-03          3477
## 79502                                    0 6.294227e-01          2684
## 46281                                    0 5.571031e-03          4666
## 46373                                    0 3.627740e-01          7800
## 33487                                    0 8.603124e-03          4416
## 83600                                    0 2.981063e-01          1636
## 38852                                    2 3.255177e-01          3283
## 66744                                    0 4.443457e-02          4500
## 22613                                    1 3.473888e-01          7754
## 61505                                    0 1.030492e+00          4000
## 99488                                    0 5.183171e-01          6250
## 104663                                   0 2.868251e-01          4500
## 40201                                    0 1.780198e-01          5049
## 5852                                     0 4.887590e-04          2045
## 64496                                    0 6.507132e-01          7500
## 24048                                    0 3.945211e-01          5000
## 145850                                   0 1.498501e-03          2001
## 55953                                    0 3.394151e-01          4000
## 69200                                    0 3.000651e-01          6141
## 95933                                    0 6.000000e+00             0
## 111685                                   0 4.047074e-01          4800
## 141259                                   1 4.258065e-01          5579
## 28758                                    0 4.122646e-01          6000
## 105408                                   0 3.036420e-01          7083
## 40964                                    0 4.258471e-03          5400
## 99734                                    0 4.128801e-01          2794
## 90279                                    1 1.614124e-02          3964
## 66543                                    0 6.342438e-01          1500
## 46292                                    0 9.055236e-01          4000
## 78667                                    0 2.787728e-01          5638
## 112408                                   0 1.695661e-01          5000
## 97138                                    0 0.000000e+00          5352
## 117594                                   0 3.696099e-01          5843
## 102746                                   0 1.811240e-01          3273
## 97991                                   98 0.000000e+00          3000
## 129141                                   0 2.372479e+00          2230
## 114932                                   0 9.863211e-02          4166
## 24444                                    0 3.647271e-01          1666
## 56533                                    1 7.201399e-01          2000
## 130391                                   0 4.623074e-02          2400
```

```
## 47158                                    0 1.173929e-01          8100
## 123114                                   0 4.277044e-01          2800
## 9409                                     0 6.998600e-02          5000
## 39659                                    0 1.907551e-01          6316
## 13872                                    0 2.608242e-03          3833
## 137331                                   0 3.287063e-01          1800
## 131287                                   0 1.054398e+00          5900
## 5545                                     0 6.890030e-02          3700
## 88757                                    0 2.818140e-01          2160
## 134187                                   0 0.000000e+00          8000
## 11708                                    3 2.482190e-01          8000
## 15191                                    0 6.917114e-02          3353
## 86030                                    0 1.311251e+00           950
## 127164                                   0 1.526158e-01          3000
## 140441                                   0 2.228418e-01          5200
## 40618                                    0 4.398241e-03          2500
## 10066                                    0 3.887393e-01          8542
## 112846                                   0 3.704815e-01          6666
## 117575                                   0 2.507498e-01          5000
## 132438                                   0 0.000000e+00          2300
## 62832                                    0 2.740060e-01          3696
## 132753                                   0 2.498966e-01          7250
## 75336                                    1 3.456703e-01          7078
## 100649                                   0 1.431328e-01          5700
## 22523                                    1 1.768100e-01          7278
## 135359                                   1 1.318298e-01          4300
## 55777                                    0 4.243394e-01          7189
## 95984                                    0 6.934541e-01          5300
## 124213                                   0 5.831334e-01          5833
## 85983                                    1 9.034193e-01          1666
## 50303                                    0 7.095630e-03          6200
## 56045                                    0 1.671004e-02          7300
## 60619                                    0 1.023591e-01          2500
## 147227                                   0 8.651721e-02          3166
## 30503                                    0 9.242391e-02          4500
## 143020                                   0 2.492226e-01          2250
## 120720                                   0 3.398760e-01          2903
## 62848                                    0 1.290214e+00          3269
## 130312                                   0 1.579684e-01          5000
## 47930                                    0 4.145171e-01          5000
## 98226                                    0 1.894660e-01          4100
## 2256                                     0 5.506812e-01          6678
## 22517                                    0 5.802469e-03          8099
## 103788                                   0 4.871164e-01          6092
## 130763                                   0 4.269081e-01          3091
## 1087                                     0 1.480248e-01          2100
## 35351                                    0 1.273726e-02          4003
## 48046                                    0 4.500982e-01          5600
## 81276                                    0 2.778088e-01          7173
## 115010                                   0 5.956809e-01          5000
## 108160                                   0 6.072470e-01          2400
## 112302                                   0 2.035055e-02          8500
## 81168                                    0 2.533000e+03             0
## 44465                                    0 2.118753e-01          5422
```

```
## 4062                                    1 2.821941e-01          4666
## 133756                                  0 6.064352e-01          5500
## 119612                                  0 3.557777e-02          3400
## 89172                                   0 6.184923e-01          2400
## 133678                                  0 2.054795e-02          2043
## 63994                                   0 6.865870e-01          7529
## 59551                                   0 1.666390e-04          6000
## 6608                                    1 3.626251e-01          8090
## 138868                                  0 7.257970e-02          8500
## 77027                                   0 8.618123e-01          3089
## 56010                                   0 3.081187e-01          6133
## 38854                                   0 3.003180e-01          2200
## 67098                                   1 3.847595e-01          1600
## 1084                                    0 1.296235e-01          3000
## 30713                                   0 1.450546e-01          6500
## 50796                                   1 4.307030e-03          6500
## 121850                                  0 2.090720e-01          1917
## 32571                                   1 1.018512e+00          2700
## 19196                                   0 2.479857e-01          3350
## 37495                                   0 2.644393e-01          3860
## 62027                                   0 1.632789e-02          3000
## 105008                                  0 3.221782e-01          5049
## 28940                                   0 4.900000e+01             0
## 127877                                  0 5.115424e-01          6800
## 60218                                   0 1.209000e+03             0
## 139427                                  0 2.247216e-01          4489
## 6888                                    0 2.433822e-01          5250
## 83308                                   0 2.350319e-01          8300
## 143118                                  0 1.484399e-02          3300
## 63957                                   0 2.913821e-01          3074
## 63363                                   0 1.156474e-01          6000
## 97203                                   0 4.257624e-01          6000
## 149826                                  0 3.123123e-01          8324
## 401                                     0 9.265000e+02             1
## 112362                                  0 8.531058e-03          3750
## 71156                                   0 3.951890e-01          2036
## 35327                                   0 8.881853e-02          6000
## 59961                                   0 2.497598e-02          1040
## 121795                                  0 2.567748e-01          2250
## 133664                                  0 1.179764e-02          5000
## 146016                                  0 0.000000e+00          1200
## 123449                                  0 7.698324e-01          6264
## 139085                                  0 6.028680e-02          3416
## 133934                                  0 3.626747e-01          2646
## 41782                                   0 8.629412e-01          1699
## 35089                                   0 5.974199e-01          4495
## 40281                                   0 4.048988e-02          4000
## 65531                                   0 2.892817e-01          6166
## 102275                                  0 5.987006e-01          2000
## 68212                                   0 2.543057e-01          6444
## 83080                                   0 1.938633e-01          2150
## 78107                                   0 4.678395e-01          5456
## 23903                                   0 2.610357e+00          3166
## 67                                      2 3.164164e-01          7723
```

```
## 82600                                    0 4.179303e-01          6000
## 54199                                    0 2.366833e-01          5800
## 120465                                   2 7.400866e-01          3000
## 62973                                    0 2.725798e-01          5546
## 66710                                    0 2.540323e-01          6447
## 43557                                    0 1.169975e-01          6700
## 141722                                   0 1.231399e-01          7324
## 117025                                   0 1.444850e-01          2193
## 88533                                    1 7.200861e-01          6969
## 116973                                   0 1.186488e-02          7163
## 118367                                   0 1.600079e-01          5080
## 130293                                   0 1.955028e-01          1600
## 128346                                   0 1.618553e+00          2500
## 48837                                    2 3.855164e-01          7000
## 115962                                   0 5.149701e-01           500
## 134741                                   0 5.888785e-01          3200
## 83877                                    0 1.543210e-03          3239
## 56731                                    0 4.284824e-02          6417
## 83662                                    0 9.454442e-02          3500
## 54305                                    0 1.069310e+00          3000
## 76568                                    0 2.399360e-02          3750
## 108816                                   0 2.777500e-01          5990
## 92641                                    0 3.813155e-03          4195
## 101693                                   2 6.755053e-01          4600
## 94901                                    0 3.510874e-01          5425
## 119986                                   0 2.517185e-01          8000
## 147026                                   0 1.629708e-01          6583
## 64596                                    1 2.659557e-01          6000
## 99868                                    0 4.433714e-02          6833
## 2074                                     0 1.173129e-01          4048
## 62604                                    0 3.789242e-01          5000
## 116383                                   0 0.000000e+00          6208
## 19701                                    0 9.640562e-02          4200
## 91221                                    0 4.038990e-01          4000
## 143989                                   0 6.327643e-01          2752
## 28032                                    1 6.051613e-01          1549
## 28909                                    0 4.499250e-03          6000
## 12598                                    0 1.190193e-03          4200
## 55898                                    0 6.280716e-01          2400
## 2001                                     0 3.653144e-03          5200
## 53834                                    0 1.531852e-01          6749
## 66400                                    0 1.286825e-01          4242
## 147326                                   0 1.045969e+00          1500
## 138207                                   0 5.816067e-01          2750
## 31030                                    0 1.604438e-02          6668
## 79799                                    0 2.459272e-01          4480
## 138889                                   2 3.540769e-01          5800
## 137353                                   0 5.184004e-01          4075
## 117282                                   0 2.716214e-01          6000
## 144781                                   0 3.415922e-01          2461
## 38237                                    0 1.274000e+03             0
## 123729                                   0 1.561298e-01          6500
## 32829                                    0 5.619962e-01          5209
## 111146                                   0 6.919388e-02          4378
```

```
## 144761                                    0 7.880848e-01          2500
## 78895                                     0 3.373322e-01          3500
## 3847                                      0 4.536266e-01          5045
## 12770                                     0 9.585104e-01          4000
## 21780                                     0 4.432136e-01          7853
## 72862                                     0 4.296066e-01          5795
## 39664                                     0 4.776549e-01          6600
## 147648                                    0 2.006239e-01          8333
## 49911                                     0 2.195022e+00          2450
## 98525                                     0 7.376362e-02          1192
## 39734                                     0 0.000000e+00          3866
## 15293                                     0 0.000000e+00          6250
## 92603                                     0 2.266364e-03          7500
## 52390                                     0 8.163265e-02          3625
## 22332                                     0 3.014225e-01          2600
## 99790                                     0 7.260657e-01          1430
## 28505                                     0 2.396953e-01          6695
## 179                                       0 9.075385e-01          2400
## 141941                                    0 2.003536e-02          1696
## 143978                                    0 1.002515e+00          1192
## 28162                                     0 4.667852e-01          4500
## 36474                                     0 1.430158e-01          3600
## 130013                                    0 2.730924e-01          8216
## 77118                                     0 4.497265e-01          5300
## 59253                                     0 9.445111e-01          3333
## 105014                                    1 4.581597e-01          8400
## 25339                                     0 1.493859e-01          3500
## 17781                                     0 5.588061e-01          6733
## 97303                                     0 0.000000e+00          5333
## 51365                                     0 6.364722e-01          6700
## 142787                                    0 5.711136e-01           906
## 137285                                    0 6.653578e-01          4583
## 111844                                    0 8.655854e-01          4500
## 52411                                     0 6.873251e-01          2500
## 42918                                     0 1.852307e-01          5700
## 91856                                     0 2.111814e-01          4900
## 528                                       1 7.906137e-01          3600
## 138086                                    0 3.041849e-01          1600
## 39520                                     0 5.372140e-01          4500
## 68153                                     0 4.601812e-01          8500
## 13698                                     0 1.789097e-02          4750
## 20529                                     0 2.380952e-02           671
## 100779                                    0 3.057575e-01          8666
## 113654                                    0 6.481481e-03          2159
## 8253                                      0 2.439070e-01          5333
## 26905                                     0 3.929252e-01          4720
## 7884                                      2 1.131794e-01          6714
## 69832                                     1 3.367967e-01          5100
## 143426                                    0 1.705084e-01          3166
## 39870                                     0 2.999211e-02          3800
## 90034                                     0 1.163832e-02          5584
## 37550                                     0 2.787579e-02          2833
## 68694                                     0 3.337980e-01          5020
## 98548                                     0 5.347326e-02          2000
```

```
## 109321                                    0 5.204275e-01          5800
## 38408                                     1 4.356171e-01          4480
## 139790                                    0 3.856209e-01          2600
## 119542                                    0 2.100000e+01             0
## 5147                                      0 3.013855e-01          7000
## 79369                                     0 3.756848e-01          3832
## 50336                                     1 2.099533e-01          4500
## 104719                                    1 3.348264e-01          6250
## 85533                                     0 2.985403e-01          5000
## 47490                                     0 5.042399e-01          4834
## 103843                                    0 1.742752e-01          3000
## 93772                                     0 1.430067e-01          4775
## 74642                                     0 2.818749e-01          6250
## 106033                                    1 7.826087e-03          3449
## 89927                                     0 3.866667e-01          4049
## 5542                                      0 5.427619e-01          2700
## 32416                                     1 5.274434e-01          4900
## 74827                                     1 1.052838e+00          2800
## 129219                                    0 7.756636e-03          8250
## 106621                                    0 1.955671e-02          2300
## 100972                                    0 2.077457e-01          4750
## 60441                                     1 5.833667e-01          2500
## 122500                                    0 8.730931e-02          3080
## 119705                                    0 2.511192e-01          4690
## 34234                                     0 2.461503e-01          4350
## 135562                                    0 2.052863e-01          3404
## 5982                                      1 1.063218e+00          8620
## 136711                                    0 2.805590e-01          4793
## 107323                                    0 5.637681e-01          4139
## 19362                                     0 2.580100e+04             0
## 37705                                     0 2.942017e-02          3500
## 71538                                     0 3.597528e-01          5500
## 92993                                     0 6.748466e-01          4400
## 71160                                     0 2.695055e-03          7420
## 18869                                     0 5.296941e-01          5000
## 3133                                      0 6.405035e-01          2700
## 21808                                     2 5.217659e-01          6500
## 14648                                     0 4.833606e-01          1832
## 92840                                     0 2.959155e-01          3500
## 59874                                     0 1.057309e+00          8584
## 120243                                    0 0.000000e+00          1250
## 18106                                     0 1.620553e-01           505
## 127546                                    0 0.000000e+00           898
## 15626                                     0 1.555986e-01          4125
## 34050                                     1 3.372771e-01          6000
## 74390                                     0 4.010000e+02             0
## 50538                                     0 5.073021e-02          1300
## 117336                                    0 2.275531e-01          2917
## 142311                                    0 5.900000e+01             0
## 134565                                    0 3.713225e-03          3500
## 49941                                     0 5.885781e-02          5147
## 93258                                     0 2.504798e-01          2083
## 90032                                     0 7.277757e-01          5241
## 148426                                    0 3.769058e-01          4000
```

```
## 82333                                    0 3.482121e-01          4166
## 28138                                    2 4.618158e-01          3050
## 65061                                    0 2.435717e-01          7816
## 144080                                   0 1.034483e-01          2116
## 149191                                   0 1.358806e+00          7000
## 98535                                    0 1.913652e+00          3288
## 8815                                     1 4.546277e-01          3316
## 132242                                   1 2.385000e+02             1
## 17759                                    0 3.102283e-01          7400
## 12579                                    0 1.134573e+00          5000
## 89820                                    0 7.773459e-03          1800
## 120457                                   0 3.401320e-01          5000
## 66382                                    0 6.846315e-01          5250
## 79768                                    0 6.056130e-01          6092
## 11337                                    0 4.219297e-01          6000
## 25980                                    0 6.797312e-01          6250
## 29974                                    0 9.124090e-04          6575
## 107425                                   0 4.595695e-02          1718
## 81473                                    0 9.486508e-01          3816
## 137853                                   0 9.846918e-02          2416
## 24520                                    4 7.087126e-01          3844
## 64880                                    0 8.842157e-01          8083
## 19191                                    0 1.759281e-01          4228
## 86061                                    0 5.026285e-01          3423
## 100695                                   0 2.678928e-02          2500
## 6897                                     1 3.878134e-01          3150
## 107583                                   0 3.688505e-01          4166
## 50360                                    0 6.117961e-01          3000
## 29533                                    0 6.021350e-01          3465
## 139697                                   0 1.188664e+00          3651
## 11079                                    0 3.374157e-02          4000
## 102556                                   0 1.043668e+00          2289
## 65732                                    0 4.788956e-01          3150
## 31684                                    0 3.716599e-01          2469
## 57347                                    2 2.698014e-01          4380
## 13208                                    0 7.904023e-02          4250
## 5779                                     4 1.809095e+00          2110
## 29109                                    0 1.464883e-01          1494
## 1563                                     0 3.625458e-01          3000
## 65499                                    0 4.199440e-01          7500
## 117659                                   1 1.555452e-01          4300
## 34426                                    0 5.071643e-01          3000
## 146051                                   0 4.218104e-01          7500
## 22430                                    0 1.364513e+00          3110
## 10726                                    0 1.805853e-01          1400
## 56035                                    0 5.186160e-01          7600
## 66077                                    0 7.605711e-02          7283
## 98769                                    0 5.690653e-01          3626
## 78661                                    0 3.857442e-02          2384
## 117193                                   0 2.031883e-01          3700
## 140398                                   0 4.287690e-01          2168
## 146914                                   0 2.842202e-01          3250
## 112482                                   0 6.359864e-01          2650
## 131414                                   0 0.000000e+00          1400
```

```
## 121887                                    0 3.917186e-02          8500
## 20799                                     1 1.080609e+00          3150
## 5665                                      0 3.579197e-01          5056
## 59073                                     0 1.265916e-01          4083
## 26452                                     0 8.873239e-01          1916
## 45671                                     0 0.000000e+00           800
## 124779                                    0 5.227825e-01          7000
## 95152                                     0 2.115656e-02          4253
## 96688                                     0 9.895502e-01          2200
## 66818                                     0 7.764412e-02          6400
## 141721                                    0 2.774460e-01          2176
## 121338                                    0 1.117633e+00          8500
## 87049                                     0 2.747710e-01          1200
## 60609                                     0 1.615903e-01          4300
## 100591                                    0 3.246701e-01          2500
## 51411                                     0 7.767597e-01          2400
## 83990                                     0 6.018091e-01          5416
## 147078                                    0 1.936336e-02          6816
## 87174                                     1 2.030895e-01          2200
## 146716                                    0 1.345060e-01          5627
## 21109                                     1 2.264107e-01          4323
## 24992                                     0 1.544051e-02          1100
## 48930                                     0 7.880926e-01          4534
## 41425                                     0 5.291500e-01          4493
## 102881                                    0 3.234346e-01          7441
## 96329                                     1 2.599480e-02          5000
## 11057                                     0 2.085583e-01          5000
## 97429                                     0 3.797304e-01          7715
## 36570                                     1 4.065330e-01          3091
## 362                                       0 6.981208e-01          2500
## 133163                                    0 1.009249e-01          3675
## 91070                                     0 2.825294e-01          7400
## 57997                                     0 7.014816e-01          5466
## 95764                                     0 3.180873e-01          4809
## 30947                                     0 6.665432e-03          5400
## 120042                                    0 1.553223e+00          2000
## 121871                                    1 4.387224e-01          7106
## 114843                                    0 3.790912e-01          6293
## 3185                                      1 2.172641e-01          4100
## 57334                                     0 1.499737e-01          5700
## 125911                                    0 3.855995e-01          3360
## 83745                                     0 3.469306e-01          5000
## 28691                                     0 5.192308e-01          2183
## 29167                                     0 8.838232e-02          5000
## 6359                                      0 1.140671e-01          5750
## 83197                                     0 2.757794e-02          2501
## 48986                                     0 2.511590e-01          3666
## 18882                                     0 1.374828e-02          8000
## 20695                                     0 1.994288e-01          2100
## 101902                                    0 4.302207e-01          2944
## 69463                                     0 4.401642e-01          3166
## 66474                                     1 2.302081e-01          3700
## 86937                                     0 2.723782e-02          8333
## 75935                                     0 1.170055e+00          2557
```

```
## 914                                    0 1.949638e-01          2620
## 82770                                  0 1.555971e-01          3206
## 101995                                 0 1.121776e-01          5000
## 120144                                 0 1.056647e+00           864
## 36119                                  0 2.306813e-01          7000
## 34902                                  0 2.996118e-01          8500
## 25482                                  0 8.730423e-02          3000
## 23006                                  0 3.242507e-01          1100
## 22007                                  0 2.039592e-02          6667
## 25974                                  0 1.576519e-01          3900
## 110690                                 0 1.646502e-01          1900
## 95261                                  0 1.356658e-01          2800
## 20038                                  0 3.883058e-01          2000
## 71654                                  2 1.391193e-01          4700
## 39862                                  1 3.650375e-01          4930
## 26827                                  0 1.021996e+00          6000
## 145316                                 0 4.304250e-01          5317
## 121726                                 0 5.249063e-02          5600
## 149792                                 0 0.000000e+00          1000
## 50272                                  0 3.800640e-01          1875
## 66450                                  0 2.645000e+02             1
## 3979                                   0 4.139988e-01          5028
## 130912                                 0 3.647818e-01          6666
## 144934                                 0 1.655228e-02          2476
## 45454                                  0 4.416842e-01          4749
## 77136                                  0 3.886730e-03          1800
## 97111                                  0 6.786002e-01          2485
## 73136                                  0 3.646765e-01          7603
## 54351                                  0 1.450131e-01          1523
## 140700                                 0 5.880085e-02          5186
## 3773                                   0 4.954875e-03          5650
## 87222                                  0 4.705464e-01          7027
## 30920                                  1 1.833762e-01          3500
## 109295                                 0 8.370616e-01          3620
## 99890                                  0 3.746878e-02          1200
## 64868                                  0 3.621633e-01          4566
## 139869                                 0 3.985181e-01          3778
## 90244                                  0 5.176627e-01          4500
## 47414                                  0 1.541025e-02          2400
## 123146                                 0 2.302945e-01          5670
## 32492                                  1 1.035586e-01          2500
## 123568                                 0 8.033989e-01          3000
## 131005                                 0 8.812715e-01          2610
## 44595                                  0 1.523906e-01          4914
## 126169                                 0 7.461695e-01          5416
## 88977                                  0 5.352362e-01          3958
## 127410                                 0 1.664134e+00          2500
## 136279                                 0 2.068491e-01          8000
## 48668                                  1 2.075636e-01          4600
## 11318                                  0 3.172805e-01          6000
## 113286                                 0 1.859256e-01          2500
## 36192                                  0 5.505196e-01          6927
## 141082                                 0 1.269769e-01          4362
## 29930                                  0 4.999208e-01          6310
```

```
## 84916                                    0 2.114978e-02          5200
## 475                                      1 2.804945e-01          5500
## 71318                                    1 4.784406e-01          5078
## 39300                                    0 3.826237e-02          3475
## 38345                                    0 4.049325e-02          6000
## 141532                                   0 3.131913e-01          6056
## 51022                                    1 4.685363e-01          7166
## 118168                                   1 6.784314e-01           764
## 48823                                    0 1.261394e-01          3400
## 2759                                     1 1.363121e-01          4408
## 45120                                    0 6.876022e-01          6113
## 60646                                    0 4.127564e-01          3558
## 118943                                   0 1.591793e-01          4629
## 86042                                    0 0.000000e+00          2000
## 140755                                   0 3.655639e-03          5470
## 31869                                    0 2.185808e-01          7200
## 106282                                   0 2.569088e-01          7200
## 2722                                     0 1.106519e-02          7500
## 122274                                   0 2.913953e-03          5833
## 49010                                    0 4.380665e-01          6950
## 14407                                    0 4.998334e-03          3000
## 70081                                    2 5.647392e-01          6000
## 111954                                   0 1.055000e+03             0
## 33653                                    0 4.304466e-01          7008
## 64633                                    0 5.767004e-01          5527
## 666                                      0 3.675537e-01          6613
## 94231                                    0 3.007552e-01          2250
## 17841                                    0 8.942662e-03          1900
## 66514                                    3 1.385681e-03          2164
## 11963                                    1 1.896130e-01          6950
## 47390                                    0 7.199177e-03          5833
## 142246                                   0 8.524992e-02          3260
## 15569                                    1 6.103088e-01          4015
## 75162                                    0 2.044990e-01          4400
## 125754                                   0 3.833616e-01          7668
## 139846                                   0 1.943611e-01          1666
## 48937                                    0 1.068278e-01          3060
## 63382                                    2 8.669571e-01          2983
## 37073                                    0 2.312087e-01          7875
## 26123                                    1 2.990176e-01          7226
## 87702                                    0 2.793923e-01          3027
## 31461                                    0 3.481086e-01          6000
## 134941                                   0 4.546544e-01          7508
## 79392                                    0 5.617413e-01          7166
## 18193                                    3 4.839710e-01          2900
## 55262                                    0 3.461635e-01          4000
## 36756                                    1 5.218009e-01          4930
## 148258                                   0 0.000000e+00           864
## 48041                                    0 2.876185e-01          3375
## 139800                                   1 3.093268e-01          5317
## 119698                                   0 3.998585e-01          2825
## 86056                                    0 5.268704e-02          2846
## 42599                                    0 4.201161e-01          7754
## 101011                                   0 2.631946e-01          5740
```

```
## 37094                                    0 2.585201e-01          3256
## 4869                                     0 3.857099e-01          6465
## 9247                                     0 2.259786e-01          3933
## 6119                                     0 4.169080e-01          7250
## 91192                                    0 5.716401e-01          2700
## 17021                                    0 5.602923e-02           820
## 95865                                    0 9.600000e+01             0
## 89204                                    0 2.220000e+03             0
## 82825                                    0 2.714914e-01          2500
## 8221                                     0 4.748119e-01          7840
## 18337                                    0 4.495072e-01          7000
## 121333                                   0 2.060575e-01          3862
## 89223                                    2 5.285886e-01          2500
## 28030                                    0 1.274602e-01          3200
## 45756                                    0 5.999000e-02          6000
## 121176                                   2 1.468561e-01          7108
## 87772                                    0 8.647854e-01          1700
## 117902                                   0 5.018443e-01          5150
## 144930                                   0 2.692308e-01          4471
## 98161                                    0 3.198516e-01          2694
## 61745                                    0 3.059235e-01          4000
## 130409                                   0 3.493192e-01          8298
## 32709                                    0 3.898816e-01          4980
## 85201                                    0 4.147377e-01          4708
## 69018                                    0 6.665834e-01          4000
## 88897                                    3 3.775157e-01          7800
## 65387                                    0 1.038262e-02          5200
## 135665                                   0 1.518276e-01          3200
## 68154                                    0 6.227380e-01          5083
## 7875                                     0 4.012290e-02          5532
## 32201                                    0 4.442007e-01          7750
## 127718                                   0 2.494108e-01          4666
## 92963                                    0 2.194313e-01          2109
## 108110                                   0 2.744315e-01          5760
## 18790                                    1 4.221215e-01          6400
## 109243                                   2 6.996502e-03          2000
## 121638                                   0 1.395132e-01          8586
## 127289                                   0 3.340638e-01          7300
## 68991                                    0 5.085542e-01          5318
## 67992                                    0 5.051485e-01          5049
## 41170                                    0 3.060912e-01          3266
## 23422                                    0 1.495894e-01          2800
## 117714                                   0 3.058552e-01          7787
## 45376                                    0 3.993890e-01          7200
## 106865                                   0 7.672931e-01          5001
## 86319                                    0 6.034215e-01          4500
## 22293                                    0 2.209424e-01          3819
## 122311                                   3 2.051836e-01          4166
## 69961                                    0 4.190019e-01          6672
## 68                                       1 6.810458e-01           764
## 85670                                    0 5.731991e-01          1290
## 65641                                    0 4.181597e-01          3292
## 137471                                   0 2.842190e-01          1241
## 93330                                    2 3.257655e-01          4800
```

```
## 17362                                    0 2.623475e-01          5000
## 108538                                   0 1.300132e+00          2278
## 145749                                   0 3.650753e-02          3916
## 123387                                   0 1.664096e+00          3500
## 116921                                   0 4.655813e-02          3500
## 83218                                    0 2.697089e-01          6113
## 25655                                    0 8.824470e-01          2500
## 90193                                    2 1.121128e-01          6100
## 89851                                    0 2.336403e-01          4125
## 55832                                    0 3.635700e-04          5500
## 92547                                    0 7.479178e-01          1800
## 68420                                    1 1.622917e-01          4380
## 147977                                   0 5.254915e-01          3000
## 47222                                    0 0.000000e+00          3505
## 51070                                    0 2.304994e-02          5986
## 119980                                   0 1.820128e-01          1400
## 135320                                   1 2.320933e-01          1800
## 74452                                    0 1.108803e+00          1010
## 21263                                    0 3.700504e-01          4166
## 59695                                    0 4.139000e+03             0
## 141582                                   0 2.282953e-01          6000
## 11330                                    0 3.355144e-01          2750
## 35532                                    1 4.566358e-01          4000
## 119022                                   0 3.526805e-01          2256
## 97269                                    0 1.109139e-01          2253
## 12663                                    1 1.233987e+00           764
## 116551                                   0 2.356513e-01          6916
## 88489                                    0 1.793946e-01          3600
## 54519                                    0 2.255532e-01          1400
## 37838                                    0 6.032106e-01          6166
## 133115                                   1 7.936550e-01          3750
## 66231                                    0 2.829816e-01          6586
## 17198                                    0 7.748963e-01          5783
## 88368                                    0 8.063395e-03          7192
## 65430                                    0 5.399240e-01          5259
## 93417                                    0 6.872976e-02          2778
## 59411                                    0 3.897402e-02          3001
## 56505                                    0 4.940675e-01          7500
## 35914                                    0 2.166098e-01          7621
## 43484                                    0 3.834466e-01          2500
## 148036                                   0 9.125355e-02          3166
## 58522                                    0 2.808137e-01          5800
## 149331                                   0 1.415887e-02          4166
## 6798                                     0 3.897895e-01          5366
## 83601                                    0 6.284932e-01          1824
## 105817                                   0 5.376344e-02           929
## 144488                                   0 1.681015e+00          1300
## 11666                                    1 3.644689e-01          2183
## 96733                                    0 1.999000e-03          2000
## 117729                                   0 7.403729e-01          4933
## 127342                                   1 7.548301e-01          1500
## 78240                                    0 2.767198e-01          5145
## 54913                                    0 7.835221e-01          5473
## 65259                                    0 2.601184e-01          6250
```

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## 47144                                    1 2.495358e-01          7000
## 90338                                    0 3.176528e-01          6100
## 66151                                    0 7.359477e-01           764
## 128909                                   0 5.021214e-01          5420
## 27604                                    0 4.698773e+00          2200
## 19342                                    0 1.403195e+00          2628
## 147323                                   0 0.000000e+00          4400
## 74238                                    0 1.867677e-01          1450
## 109769                                   0 4.938272e-02          1700
## 146545                                   0 1.689578e-01          4000
## 120210                                   0 5.066938e-01          5900
## 93146                                    0 8.493823e-01          5908
## 28928                                    0 4.844025e-01          6250
## 52705                                    0 1.607321e+00           600
## 47405                                    0 2.235772e-01          5165
## 93239                                    0 3.071161e+00           800
## 29016                                    0 1.195761e-01          5000
## 33936                                    0 1.683248e-01          3718
## 65093                                    0 5.282453e-02          6000
## 128700                                   0 9.371206e-01          2305
## 59138                                    1 1.114611e+00          8000
## 57807                                    0 1.050397e-01          5416
## 117108                                   0 4.598467e-02          3000
## 77318                                    0 7.875760e-01          2301
## 128531                                   0 2.930460e-01          4500
## 75516                                    0 6.996113e-02          1800
## 38930                                    0 1.637752e-01          1440
## 61026                                    0 2.945881e-01          3750
## 142614                                   0 4.769725e-01          2800
## 20836                                    0 2.865214e-01          2477
## 103415                                   0 1.028201e-01          7410
## 87857                                    2 4.829623e-01          2200
## 4981                                     0 3.837573e-01          7350
## 12                                       0 5.315288e-01          6501
## 66143                                    0 3.978563e-01          6250
## 72113                                    0 2.887351e-01          2600
## 113928                                   0 3.521364e-01          4750
## 140987                                   0 2.067989e-01          6000
## 25661                                    0 1.107223e-01          4000
## 127648                                   0 3.448773e-01          4850
## 132619                                   0 1.042753e-03          3835
## 139257                                   0 3.596884e-01          6032
## 91385                                    0 2.083625e-01          7150
## 91852                                    0 2.168897e-01          6500
## 134917                                   5 4.493412e-01          2200
## 102964                                   1 5.328275e-01          6853
## 142457                                   1 5.069991e-01          7500
## 43838                                    0 2.540703e-01          2333
## 1644                                     0 1.941581e-01          4073
## 129512                                   0 5.048907e-01          3475
## 100812                                   0 2.273658e-01          6350
## 112886                                   0 3.901742e-01          3500
## 88075                                    0 5.146925e-01          3300
## 132449                                   0 2.176626e-01          4166
```

```
## 35345                                    0 5.941583e-01          1300
## 48207                                    0 6.803082e-01          7916
## 60669                                    2 2.333646e-01          3200
## 148798                                   1 9.472551e-03          4644
## 42447                                    0 5.214957e-01          5000
## 142065                                   0 3.657932e-01          5647
## 93241                                    0 5.813856e-01          4791
## 114896                                   0 1.792807e-01          7200
## 55060                                    0 2.729864e-01          6666
## 81565                                    0 3.059049e-01          4690
## 144526                                   0 2.328264e-01          1906
## 19585                                    0 3.074906e+00           800
## 133941                                   0 6.131341e-01          4750
## 68484                                    0 1.989241e-02          7992
## 15046                                    0 4.765047e-01          5000
## 111201                                   0 3.422550e-01          6500
## 1578                                     0 5.341554e-01          4054
## 58669                                    0 7.700486e-02          6583
## 61175                                    0 0.000000e+00          4096
## 57363                                    0 4.139988e-01          5028
## 71519                                    0 5.361702e-01          2819
## 9242                                     0 1.802600e-01          7000
## 21116                                    0 3.941550e-02          5200
## 51488                                    0 8.639309e-03          4166
## 139151                                   0 2.577205e-01          4500
## 28979                                    0 3.396173e-01          3500
## 97856                                    1 2.154855e-01          6250
## 101530                                   0 2.854294e-01          6519
## 19976                                    0 5.813449e-01          3687
## 97330                                    0 4.061679e-01          5706
## 93205                                    0 1.717710e-01          6758
## 57932                                    0 1.177632e-01          8100
## 97328                                    0 6.111862e-01          3700
## 39911                                    0 6.696091e-01           792
## 59076                                    0 2.656497e-01          1900
## 42398                                    0 3.363114e-01          4700
## 95233                                    0 1.340198e+00          1310
## 142950                                   0 2.407000e+03             0
## 127535                                   0 1.371785e-01          2565
## 135231                                   0 1.520689e-01          4760
## 45554                                    0 5.749281e-03          8000
## 28642                                    0 1.006397e+00          2500
## 125461                                   0 6.589412e-02          4400
## 32223                                    0 1.538951e-01          7855
## 40209                                    1 1.996365e-01          3300
## 102136                                   0 5.094423e-01          4500
## 109566                                   0 2.269810e-01          6700
## 86852                                    0 1.913867e-01          5804
## 15797                                    0 2.474807e-01          4266
## 104507                                   0 1.769558e-01          4000
## 115158                                   0 1.799625e-01          4800
## 141503                                   1 2.907968e-01          3400
## 134225                                   2 5.618369e-01          6031
## 119694                                   1 9.850250e-01           600
```

```
## 49979                                    0 3.302225e-02          4178
## 133552                                   0 4.741641e-01          6250
## 5798                                     2 1.378841e-01          3676
## 13297                                    0 1.953111e-01          5416
## 63427                                    0 1.852050e-01          7488
## 11470                                    0 1.889110e-01          3011
## 58487                                    0 2.159270e-01          5700
## 49058                                    0 3.987463e-01          7816
## 87962                                    0 7.544152e-01          3000
## 70417                                    0 5.472724e-02          5700
## 107185                                   0 5.203102e-01          7606
## 76545                                    0 2.449184e-01          3000
## 111091                                   0 6.831436e-01          3600
## 106028                                   0 2.388806e-01          2000
## 11609                                    0 5.315080e-01          2300
## 39488                                    1 2.888465e-01          4195
## 50098                                    0 7.081722e-01          7500
## 147983                                   0 1.073119e-01          1900
## 90362                                    0 4.901085e-01          4700
## 3231                                     0 0.000000e+00          4501
## 1189                                     0 3.402001e-02          8494
## 33890                                    0 2.929590e-01          4416
## 60155                                    0 1.730904e-01          5707
## 88455                                    0 7.808750e-02          5416
## 48171                                    0 3.220147e-01          5300
## 68893                                    1 4.460721e-01          8464
## 23175                                    0 4.756191e-01          3916
## 19796                                    0 2.171016e-01          1800
## 15617                                    0 9.629045e-02          3800
## 85175                                    0 2.256051e-01          6568
## 52343                                    2 2.253862e-01          3300
## 117466                                   0 5.262585e-01          3674
## 118436                                   0 3.478261e-01          2000
## 145367                                   0 6.318273e-01          8476
## 35028                                    0 1.045791e-01          5000
## 2065                                     0 5.186836e-01          2916
## 22907                                    0 4.599078e-01          4339
## 135632                                   0 7.209275e-01          8667
## 129077                                   0 2.606939e-01          7176
## 117604                                   0 3.806101e-01          5146
## 116800                                   0 6.332733e-01          5000
## 79703                                    3 6.792936e-01          7813
## 56924                                    1 2.613438e-01          6875
## 127586                                   0 1.136926e-01          5250
## 33085                                    0 3.864657e-01          6900
## 77936                                    0 1.549110e-01          4550
## 87251                                    0 2.691858e-01          7700
## 65761                                    0 1.883263e-01          3100
## 131228                                   0 9.595870e-01          5616
## 129739                                   0 3.686052e-01          6000
## 91612                                    0 3.241081e-01          6250
## 60983                                    0 7.758544e-01          6700
## 9697                                     0 3.665267e-01          5000
## 70325                                    0 4.017288e-01          4395
```

```
## 124532                                    0 1.628940e-01          7200
## 94657                                     1 2.259138e+00          2133
## 76824                                     1 6.502016e-01          2975
## 146825                                    0 3.588934e-01          6650
## 112116                                    0 1.224545e-01          7414
## 95058                                     0 1.375626e-01          2994
## 77608                                     0 5.394094e-02          4300
## 136239                                    0 3.687540e-01          6323
## 112177                                    0 6.921953e-01          3420
## 53593                                     0 5.882368e+00          3816
## 4159                                      1 1.175294e-01          4500
## 143801                                    0 2.006100e-01          2950
## 7052                                      0 3.993073e-01          4041
## 72924                                     0 5.154799e-01          5167
## 6953                                      0 9.258148e-02          5000
## 70822                                     0 2.111141e-01          3760
## 26050                                     0 8.331418e-01          4350
## 57634                                     0 9.753231e-02           850
## 139590                                    2 6.153503e-01          4481
## 26927                                     0 7.755226e-02          3300
## 26454                                     0 6.620780e-02          6101
## 63872                                     0 0.000000e+00          5500
## 21624                                     0 1.932045e-02          1500
## 147134                                    0 2.424596e-01          6000
## 1193                                      0 2.242833e-01          3557
## 115554                                    0 2.554978e-01          2500
## 46066                                     0 9.790893e-02          5116
## 22173                                     0 2.189562e-01          5000
## 118992                                    0 3.713939e-01          3292
## 71312                                     0 1.076923e+00          1650
## 45415                                     1 5.100970e-01          3812
## 6641                                      0 8.958805e-02          7500
## 65844                                     0 2.719226e-01          6100
## 64989                                     1 2.284286e-01          4600
## 33178                                     1 5.402730e-01          6666
## 126749                                    0 2.727931e-01          8280
## 93571                                     0 4.428919e-01          7800
## 77960                                     0 6.919666e-01          5862
## 103102                                    0 3.123567e-01          4798
## 131660                                    1 6.569082e-01          2800
## 66110                                     1 2.725599e-01          3800
## 834                                       0 3.350367e-01          4500
## 95680                                     0 2.414879e-02          6666
## 14166                                     0 3.285421e-03          2434
## 29391                                     0 3.911599e-01          7827
## 132622                                    0 6.812933e-02           865
## 126311                                    0 3.589606e-01          3732
## 846                                       1 3.325271e-01          7854
## 11818                                     0 5.308938e-02          3333
## 93257                                     1 1.110420e+00          4500
## 105592                                    0 2.398910e-01          2200
## 83974                                     0 3.329009e-01          6166
## 56022                                     0 1.741176e-01          3399
## 35037                                     3 5.779037e-01          5647
```

```
## 141732                                    1 3.843817e-01          7900
## 112497                                    0 2.894265e-01          2231
## 125466                                    0 1.742608e-02          7000
## 107982                                    0 3.305339e-01          5000
## 119466                                    0 8.469849e-01          3979
## 33668                                     0 1.550000e+02             0
## 79940                                     0 9.330302e-01          2418
## 37973                                     0 1.192773e-02          5700
## 91621                                     0 3.935355e-01          3000
## 125984                                    0 4.508475e-01          5014
## 9022                                      1 2.689561e-01          5881
## 119003                                    0 1.708460e-01          8533
## 102285                                    0 3.518801e-01          3935
## 104498                                    0 2.450944e-01          2700
## 113695                                    1 1.995020e-01          6425
## 60874                                     0 0.000000e+00          4000
## 140196                                    0 0.000000e+00          7800
## 125353                                    0 1.819297e-01          6518
## 68487                                     0 3.684662e-01          3500
## 21502                                     0 2.742274e-01          3332
## 6791                                      0 3.518374e-02          2557
## 109299                                    0 7.810962e-02          6093
## 60088                                     0 0.000000e+00          1835
## 102542                                    0 5.108802e-01          5100
## 18240                                     3 2.124469e-02          4000
## 34310                                     0 4.370517e-01          4042
## 119604                                    0 6.496732e-01           764
## 7501                                      0 1.279488e-02          2500
## 64738                                     0 1.515388e-01          6400
## 91227                                     0 4.199067e-01          4500
## 124306                                    0 3.657674e-01          2260
## 148273                                    0 2.990887e-01          6034
## 22791                                     0 8.258087e-01          5625
## 65848                                     0 0.000000e+00           864
## 115704                                    0 2.542131e-01          3500
## 16883                                     0 2.063885e-01          7262
## 4049                                      1 1.192020e+00           400
## 131864                                    0 1.335476e-01          5600
## 26530                                     1 6.740918e-01          2917
## 60443                                     0 9.286436e-01          7917
## 47737                                     1 6.778510e-04          5900
## 23459                                     0 5.999000e-03          6000
## 24560                                     0 3.470703e-01          6672
## 21864                                     0 1.154711e-01          4000
## 33009                                     0 1.441066e-01          2400
## 95465                                     0 2.332945e-03          6000
## 20203                                     0 1.997639e-01          3388
## 83672                                     0 4.374432e-01          3300
## 131599                                    0 8.100712e-02          7307
## 62371                                     0 2.579570e-01          6000
## 30681                                     0 4.279822e-01          3151
## 101776                                    0 1.243262e-01          5750
## 50865                                     0 1.077844e-01          1669
## 32903                                     0 2.733896e-01          5215
```

```
## 48351                                    0 3.110844e-01          6666
## 18296                                    0 3.528242e-01          2513
## 45317                                    1 2.715054e-01          7439
## 3100                                     0 5.248688e-03          4000
## 70286                                    0 1.815528e-01          3425
## 23292                                    0 3.686669e-01          5565
## 135377                                   0 2.681464e-01          5000
## 97197                                    0 1.157768e-01          5000
## 38011                                    0 2.793678e-01          2340
## 69672                                    0 4.878827e-01          3135
## 41640                                    0 1.016337e-01          6916
## 82122                                    0 4.235604e-01          3420
## 111882                                   1 4.609232e-01          6000
## 116942                                   0 4.861767e-01          2965
## 92516                                    0 6.846725e-01          5923
## 136375                                   0 3.778032e-01          7000
## 130710                                   1 4.445216e-01          7200
## 7818                                     0 3.019700e-01          3400
## 67260                                    0 3.246320e-01          3600
## 65187                                    0 3.574959e-01          1820
## 29611                                    0 2.888247e-03          4500
## 7317                                     0 2.935440e-01          8100
## 76909                                    0 1.235955e-02          2669
## 138551                                   2 3.447650e-02          5510
## 136883                                   0 2.188403e-01          4500
## 110625                                   0 1.160669e-01          5918
## 37083                                    0 1.405811e-02          3200
## 44500                                    0 6.807765e-02          7417
## 113037                                   0 4.031830e-01          6785
## 115304                                   0 9.753941e-01          2600
## 47631                                    0 7.603814e-01          3250
## 129045                                   0 1.068644e+00          3000
## 130885                                   0 8.980255e-01          4000
## 80309                                    0 1.481704e-01          3333
## 8738                                     0 7.899042e-02          4278
## 4956                                     0 3.972740e-01          7996
## 37082                                    0 6.956886e-01          7166
## 130340                                   0 2.216946e-01          4000
## 84057                                    0 2.551584e-01          6881
## 143839                                   0 5.206945e-01          6450
## 5190                                     0 2.742480e-01          6216
## 77714                                    0 3.707471e-01          8258
## 104484                                   0 1.166235e-01          2700
## 4342                                     0 3.175434e-01          4200
## 17776                                    0 3.745834e-01          4500
## 148097                                   0 9.369144e-03          1600
## 18830                                    0 7.277051e-01          5045
## 137807                                   0 0.000000e+00          8000
## 144553                                   0 1.805686e-01          3200
## 17134                                    0 5.791367e-01          3613
## 6512                                     0 7.029927e-02          7083
## 132109                                   0 1.972007e-01          4000
## 4743                                     0 9.762648e-01          1600
## 134433                                   1 1.353028e+00          2030
```

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## 64374                                    1 5.336885e-01          6945
## 60986                                    0 1.134715e+00          7333
## 53098                                    1 2.142347e-01          4200
## 128567                                   0 2.366141e-01          4500
## 105269                                   0 6.837368e-01          7888
## 84920                                    0 1.027321e+00          5416
## 115408                                   0 1.124765e-01          6916
## 60829                                    0 2.382936e-01          6000
## 49606                                    1 0.000000e+00          4500
## 69296                                    0 3.647733e-03          3837
## 77184                                    0 3.788809e-01          5700
## 39947                                    0 3.521327e-01          4219
## 145528                                   1 2.332667e+00          1000
## 85198                                    0 2.151878e+00          1250
## 141776                                   0 4.000000e+00             0
## 105711                                   0 3.046894e-02          4200
## 90582                                    1 6.936285e-01          4833
## 36327                                    0 2.724970e-01          5922
## 116673                                   4 3.724332e-01          7450
## 124420                                   0 5.070000e+02             0
## 39920                                    0 4.321187e-02          3100
## 86814                                    0 1.592802e-01          3000
## 21438                                    1 1.412392e-01          1500
## 127993                                   0 6.450000e+02             0
## 15914                                    0 1.050985e+00          2333
## 98861                                    0 2.144799e-01          6988
## 5755                                     3 3.141143e-01          6000
## 70925                                    0 2.681265e-01          2054
## 31220                                    0 2.509881e-01          3541
## 25290                                    0 2.504638e-02          1077
## 136172                                   0 2.963017e-01          6840
## 105053                                   0 1.372549e-01          2600
## 67496                                    1 2.202899e-01          7934
## 123827                                   0 3.722098e-01          7167
## 123331                                   0 1.154461e+00           750
## 116894                                   0 1.689727e-01          8166
## 143781                                   1 4.629714e-01          2200
## 148700                                   0 1.267099e-01          4166
## 9539                                     0 3.878642e-01          5800
## 15262                                    1 4.397121e-01          5000
## 126019                                   0 4.885871e-01          5300
## 81218                                    0 2.963000e+03             0
## 72453                                    0 3.118061e-01          8376
## 148082                                   0 1.391629e-01          3750
## 33173                                    0 3.788600e-01          7350
## 4042                                     1 6.111944e-01          2000
## 82548                                    0 4.081863e-01          7988
## 105800                                   0 1.299385e-01          3416
## 3321                                     0 8.937198e-02          5795
## 145674                                   3 3.247968e-01          4060
## 23764                                    0 4.209474e-01          8000
## 146122                                   0 8.314402e-02          2200
## 132066                                   0 3.677634e-01          2400
## 139291                                   0 4.020257e-01          5133
```

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## 1310                                    0 4.967292e-01          7031
## 61369                                   0 1.666204e-03          3600
## 148578                                  0 6.136364e-01          5059
## 110001                                  0 1.756864e-01          6300
## 126753                                  0 2.711208e-01          6450
## 117679                                  2 4.244297e-01          6311
## 13460                                   1 4.315088e-01          6905
## 109458                                  0 1.354281e+00          2195
## 71053                                   0 2.269700e-01          1801
## 148828                                  0 4.756098e-01          6067
## 27276                                   0 7.398520e-03          5000
## 149607                                  0 0.000000e+00          4666
## 112667                                  0 2.540909e-01          4399
## 83470                                   0 5.456354e-01          8041
## 128353                                  1 1.643343e-01          2500
## 132913                                  0 2.999000e-03          3000
## 59379                                   0 6.076437e-02          3636
## 102304                                  0 2.866131e-01          2860
## 108155                                  0 2.750600e-01          5416
## 120609                                  0 3.978975e-01          6943
## 42028                                   0 8.013893e-01          3166
## 23350                                   0 7.323944e-01          2200
## 79266                                   0 1.732155e-01          4300
## 110614                                  0 2.441512e-01          3333
## 141404                                  0 4.830344e-01          7750
## 78436                                   0 3.610556e-01          2500
## 4675                                    0 0.000000e+00          2453
## 118006                                  0 1.927266e-01          5416
## 122460                                  1 3.889245e-01          7800
## 111718                                  0 3.730473e-01          4800
## 146460                                  0 3.499000e-01          3500
## 109892                                  0 2.165196e-01          2493
## 49807                                   0 2.962201e-01          3888
## 138374                                  0 3.139372e-01          5000
## 133689                                  0 2.783888e-01          7000
## 74004                                   0 2.409012e-01          7500
## 134406                                  0 4.865740e-01          7410
## 52891                                   0 2.895672e-01          8156
## 104289                                  0 1.235797e-01          7128
## 72307                                   1 7.344741e-02          5200
## 74634                                   0 2.388118e-01          5116
## 88579                                   0 3.028486e-01          2000
## 52927                                   0 5.656496e-03          5833
## 116556                                  0 4.376405e-01          5780
## 140907                                  0 3.230272e-03          4333
## 50239                                   1 1.322576e-01          7250
## 43280                                   0 2.572980e-01          7364
## 70179                                   0 4.657454e-01          3400
## 147256                                  0 1.128696e-01          2400
## 6969                                    0 3.421812e-01          5198
## 4969                                    0 4.464202e-01          6410
## 20633                                   2 3.041000e+03             0
## 97804                                   0 8.997001e-03          3000
## 54014                                   0 6.772645e-01          5000
```

```
## 103045                                    0 5.647302e-01          5800
## 98099                                     0 3.705768e-01          4125
## 68133                                     0 3.068860e-01          6200
## 28118                                     0 9.225561e-02          7088
## 89627                                     0 6.675258e-01          2715
## 12376                                     0 3.690896e-01          5667
## 119332                                    1 1.805277e-01          6480
## 120878                                    1 3.196347e+00           437
## 56617                                     0 1.915081e-01          3414
## 99410                                     0 7.924415e-01          5000
## 140461                                    0 4.904051e-01          3282
## 31688                                     0 4.538808e-01          5333
## 53363                                     0 7.993610e-04          1250
## 130630                                    0 6.042995e-01          8000
## 146435                                    0 8.598280e-02          5000
## 44908                                     1 5.458167e-01          6525
## 24256                                     0 1.479507e-01          3000
## 83079                                     0 5.867665e-02           800
## 106497                                    0 5.974905e-03          5020
## 37215                                     0 3.020089e-01          2936
## 141842                                    0 1.148091e-01          7150
## 100110                                    1 2.304137e-01          4543
## 29569                                     0 7.286282e-01          2011
## 147164                                    1 4.825480e-01          4583
## 79994                                     0 2.213274e-01          3600
## 82009                                     0 3.008866e-01          5300
## 3693                                      0 6.615564e-02          6000
## 75612                                     0 7.598001e-01          3800
## 85182                                     0 2.754311e-01          4000
## 141648                                    0 5.125786e-01          6041
## 35845                                     0 9.205703e-02          4909
## 26730                                     0 6.577139e-01          1600
## 36780                                     0 1.860524e-01          7900
## 146713                                    0 9.945028e-02          2000
## 110226                                    0 2.595328e-01          5008
## 39957                                     0 9.876050e-02          2500
## 133343                                    0 4.694041e-01          7500
## 24049                                     0 3.136716e-01          4000
## 74705                                     1 7.331260e-01          6429
## 22865                                     1 9.186352e-02          8000
## 142911                                    0 2.180805e-01          2333
## 30960                                     1 1.389397e-01          3828
## 98929                                     1 1.379655e-01          4000
## 59952                                     3 2.358702e-01          4900
## 33858                                     0 1.451085e-01          3362
## 55176                                     0 5.808881e-01          3850
## 71778                                     2 4.729970e-01          1684
## 136957                                    0 1.463814e+00          2500
## 102852                                    0 2.880586e-01          3960
## 4487                                      0 1.008884e+00          1800
## 104254                                    0 3.775311e-01          6666
## 144067                                    0 1.987663e-02          5835
## 95158                                     1 5.988001e-01          8000
## 94204                                     0 3.143747e-01          6100
```

```
## 128360                                    0 3.702189e-01          4888
## 143161                                    0 5.482811e-01          7300
## 140148                                    0 1.518080e-01          6000
## 16665                                     1 4.137248e-01          8072
## 80011                                     0 1.982019e-01          4893
## 103140                                    0 7.659428e-01          2900
## 100846                                    0 1.175877e+00          2080
## 59355                                     0 5.766004e-01          6435
## 21448                                     0 2.482425e-01          6400
## 106231                                    0 6.861372e-02          4998
## 4638                                      0 5.070883e-01          2750
## 22871                                     0 5.536258e-01          6563
## 29363                                     0 4.414932e-01          2785
## 44615                                     0 5.476221e-01          7800
## 91147                                     0 8.565310e-03          2334
## 94438                                     0 2.104709e-03          3800
## 23468                                     0 2.509180e-01          4084
## 34575                                     0 5.164879e-03          2516
## 28256                                     0 1.839503e-01          3538
## 11571                                     0 4.095840e-04          4882
## 68761                                     0 5.521896e-01          6370
## 4228                                      0 8.364019e-01          1900
## 33519                                     0 2.433976e-01          1400
## 36434                                     0 8.402043e-01          5481
## 109520                                    0 4.501815e-01          2478
## 113874                                    0 2.596064e-01          3200
## 31700                                     0 4.926077e-01          4666
## 109269                                    0 2.255029e-01          8500
## 24586                                     0 2.663675e-01          4902
## 46357                                     0 6.639229e-01          4251
## 54182                                     1 3.391764e-01          8328
## 96646                                     0 2.170904e-01          6646
## 88142                                     0 4.316029e-01          7916
## 131182                                    0 4.423576e-01          6548
## 4751                                      0 3.676317e-01          4800
## 134762                                    0 9.419250e-01          3064
## 96310                                     0 4.602552e-01          1018
## 49511                                     0 3.251429e-01          3499
## 75344                                     0 1.208099e-01          4444
## 34344                                     0 9.041096e-02          1824
## 128539                                    0 5.033501e-01          4775
## 139877                                    0 4.179162e-01          2600
## 105669                                    0 2.501071e-01          7000
## 89179                                     0 2.424601e-01          1690
## 97191                                     0 4.411710e-01          5396
## 67719                                     1 5.593423e-01          7540
## 84613                                     0 4.073320e-01          5400
## 8149                                      0 8.848525e-02          6000
## 98827                                     0 3.603789e-01          7283
## 66428                                     0 5.528618e-01          4000
## 65009                                     0 3.374578e-03          8000
## 13203                                     0 1.258577e-01          5100
## 145843                                    0 3.748438e-03          2400
## 21352                                     0 2.523268e-01          2900
```

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## 123764                                    0 4.792596e-03          6050
## 64447                                     0 2.249719e-03          8000
## 58225                                     0 1.631560e-01          2800
## 143139                                    0 1.756037e+00          1200
## 137605                                    0 1.009569e+00          3970
## 45472                                     0 2.639848e-01          4200
## 49340                                     0 1.802040e-01          7940
## 123529                                    0 4.030582e-01          5100
## 39498                                     0 5.368371e-01          8333
## 102385                                    1 2.987761e-01          4166
## 70505                                     0 4.129741e+00           500
## 105778                                    0 4.458958e-01          6200
## 113885                                    0 3.669035e-01          7178
## 149846                                    0 4.120830e-01          4435
## 70529                                     0 0.000000e+00          2332
## 118675                                    0 0.000000e+00          3627
## 63538                                     0 6.274510e-01          2600
## 61932                                     0 0.000000e+00          2000
## 30402                                     0 3.796551e-01          4000
## 72203                                     0 2.315378e+00          2171
## 119109                                    0 1.732756e-01          3000
## 53034                                     0 3.447586e-01          3500
## 132212                                    0 5.699456e-01          4045
## 65409                                     0 2.227935e-01          2333
## 55880                                     0 1.754500e+03             1
## 62507                                     1 5.912247e-01          3600
## 34                                        0 3.138123e-01          7000
## 144475                                    0 1.777478e+00          6295
## 4206                                      0 7.912010e-01          8500
## 92536                                     0 1.581403e-01          6000
## 118907                                    0 1.882123e-01          3070
## 51131                                     1 1.614731e-01          6000
## 136640                                    0 1.042214e-01          4950
## 32419                                     1 1.156000e+03             0
## 35880                                     0 1.300986e-01          3750
## 25672                                     0 3.029822e-01          5666
## 72205                                     0 2.938000e+03             1
## 125889                                    0 2.556938e-01          8517
## 138165                                    0 5.168539e-01           800
## 30062                                     0 2.830974e-01          1200
## 52542                                     0 3.893053e-01          2000
## 147021                                    0 6.207962e-01          5500
## 128679                                    0 1.468052e-01          8466
## 103932                                    1 1.931009e-01          8000
## 69732                                     0 6.188486e-01          7416
## 135709                                    0 8.044280e-01          3251
## 119263                                    0 2.332945e-01          6000
## 42544                                     0 2.783505e-01          3200
## 98926                                     0 2.961564e-01          4500
## 29637                                     0 2.627895e-01          6000
## 149288                                    1 2.432793e-01          4500
## 125390                                    0 3.412654e-01          5420
## 109802                                    0 6.128468e-01          4000
## 94050                                     0 5.512178e-01          8375
```

```
## 25055                                    0 4.028871e-01          4571
## 46653                                    0 2.683879e-01          3330
## 58057                                    0 4.668859e-01          4257
## 23021                                    0 6.647327e-01          8100
## 32782                                    0 5.660644e-02          7083
## 120190                                   0 3.516618e-01          4091
## 4833                                     0 7.117627e-01          3000
## 147817                                   0 3.374578e-03          8000
## 5337                                     1 4.363706e-01          2600
## 4987                                     0 5.310393e-01          4300
## 32329                                    0 1.799775e-02          2666
## 137866                                   0 3.696576e-01          4000
## 70662                                    0 1.028717e-01          2750
## 124970                                   0 1.748543e-02          1200
## 91782                                    0 1.759718e-03          6250
## 101110                                   0 5.444377e-01          4916
## 42712                                    0 1.403582e-01          2400
## 32723                                    0 8.331197e-02          3900
## 54193                                    1 3.923215e-01          5000
## 23565                                    0 6.294155e-01          6227
## 109798                                   0 5.652653e-01          6350
## 57390                                    0 1.373505e-02          2256
## 118662                                   0 5.613006e-01          1875
## 38005                                    0 2.456686e-01          2250
## 18276                                    0 3.439691e-01          4136
## 92495                                    0 4.993910e-02           820
## 115742                                   0 7.584139e-01          3000
## 58702                                    0 1.172774e-01          8432
## 71052                                    0 2.339908e-01          3700
## 113878                                   0 8.751387e-01          3603
## 126754                                   0 7.807398e-01          3000
## 43124                                    1 2.712475e-01          8600
## 11547                                    0 6.000969e-01          4125
## 106784                                   0 2.294713e-01          8000
## 95928                                    1 3.431777e-01          6060
## 39049                                    0 1.140494e-01          8583
## 144540                                   0 4.808760e-01          6666
## 34807                                    0 4.777537e-01          6000
## 53893                                    0 7.999360e+00          6250
## 88068                                    0 1.538225e-03          6500
## 93163                                    0 1.080024e-01          6647
## 125049                                   1 1.806065e-01          3000
## 86182                                    0 4.555979e-01          7600
## 117777                                   0 1.045505e+00           900
## 124527                                   0 6.357856e-03          1100
## 136234                                   0 1.439424e-02          2500
## 8587                                     0 2.616846e-01          4000
## 25124                                    0 2.295901e-01          3000
## 26503                                    0 0.000000e+00          1000
## 61975                                    1 4.809198e-01          6000
## 6473                                     0 3.180256e-01          3200
## 89696                                    0 4.546211e-01          1200
## 86965                                    0 2.587964e-01          5200
## 59928                                    1 3.105603e-01          4800
```

```
## 39104                                    0 1.519578e-01          8350
## 121103                                   0 2.545818e-01          3000
## 63423                                    1 9.117083e-03          2083
## 114319                                   1 2.260024e-01          3291
## 59536                                    0 2.342580e-01          7209
## 119165                                   0 3.965869e-01          8320
## 113614                                   0 7.037748e-02          4688
## 68521                                    0 9.485459e-01          4916
## 29138                                    1 5.855173e-01          6600
## 41000                                    0 2.202599e-01          3000
## 94395                                    0 1.970484e-01          4810
## 66349                                    0 1.307970e-01          3600
## 2167                                     0 4.203108e-01          8300
## 109427                                   0 3.832493e-01          4166
## 21380                                    2 1.780917e+00          4600
## 16163                                    0 4.944578e-01          6224
## 46278                                    0 5.374925e-01          5000
## 60921                                    0 5.185963e-01          3333
## 13632                                    0 1.988333e-01          8227
## 56072                                    0 5.303674e-01          4000
## 9266                                     0 2.715105e-01          4183
## 101898                                   0 9.195201e-01          4000
## 1440                                     0 1.626298e-01          2600
## 55867                                    0 3.367772e-01          6000
## 144910                                   0 6.508970e-01          7524
## 111878                                   0 3.765682e-01          5180
## 138660                                   0 9.400309e-01          3234
## 18851                                    0 1.732067e-01          4000
## 34079                                    0 3.550477e-01          2931
## 100971                                   0 2.547013e-01          4200
## 133922                                   0 2.253554e-01          8652
## 59078                                    0 6.145949e-02          7207
## 4549                                     1 1.998979e-01          7833
## 82507                                    0 2.668412e-01          4200
## 147568                                   1 4.333133e-01          5000
## 137893                                   1 9.052083e-01          1919
## 41832                                    0 2.944345e-01          4455
## 3905                                     0 2.684480e-01          7222
## 114591                                   0 0.000000e+00          1113
## 81840                                    0 1.479704e-02          5000
## 67826                                    0 2.361603e-01          7333
## 141545                                   0 3.315561e-01          3000
## 92404                                    0 2.789206e-01          4520
## 144391                                   0 6.324846e-02          8600
## 84929                                    0 3.082921e-01          6668
## 119701                                   0 9.918715e-01          5166
## 106570                                   0 9.149787e-01          7750
## 91857                                    0 3.274000e+03             0
## 65141                                    0 5.800667e-01          6300
## 133765                                   0 4.932495e-01          6517
## 142458                                   0 3.775112e-01          3334
## 120950                                   0 6.777418e-01          3400
## 29187                                    1 3.192823e-01          7021
## 4912                                     0 3.048369e-01          2666
```

```
## 55167                                    0 8.355220e-01          3045
## 42917                                    0 1.069786e-01          5000
## 63349                                    1 1.797914e-02          5561
## 71575                                    0 2.401396e-01          5729
## 43283                                    0 1.160760e-01          3893
## 8910                                     0 6.529319e-01          4416
## 134880                                   0 3.260899e-01          7500
## 126422                                   0 1.303781e-02          2300
## 110320                                   0 0.000000e+00          1000
## 77308                                    0 4.328147e-02          3534
## 3228                                     0 8.336458e-02          8000
## 128488                                   2 3.513286e-01          4741
## 53638                                    4 4.006374e-01          5333
## 42267                                    0 5.003133e-01          3191
## 19515                                    0 3.407399e-01          8460
## 20637                                    0 7.045952e-01          2284
## 91507                                    0 4.284144e-01          3638
## 101944                                   0 1.701107e-01          7500
## 33720                                    0 9.741027e-01          2200
## 65466                                    0 3.077865e-01          4083
## 7997                                     0 4.753960e-01          4734
## 93255                                    0 3.487742e-01          7749
## 117744                                   1 7.170795e-01          2300
## 97971                                    0 3.507569e-01          7001
## 123404                                   0 7.403020e-02          3376
## 94560                                    0 1.807461e-01          7800
## 32090                                    0 3.316783e-01          5034
## 54778                                    0 3.550354e-01          5083
## 145601                                   0 1.866097e+00           701
## 14458                                    0 5.758232e-01          4615
## 122412                                   0 2.758621e-01          8467
## 113496                                   0 4.229295e-01          6000
## 11393                                    1 3.286242e-01          4600
## 135687                                   0 7.273763e-01          7900
## 55407                                    0 2.799300e-02          4000
## 57319                                    0 3.067456e-01          4224
## 72073                                    0 2.705405e-01          3200
## 70581                                    0 4.897841e-01          6900
## 9563                                     3 2.955829e-01          3010
## 35820                                    0 2.751284e-01          6814
## 148832                                   0 0.000000e+00          2298
## 55726                                    0 9.936224e-01          4703
## 82258                                    0 6.772660e-01          6100
## 21527                                    1 1.768551e-02          2600
## 49303                                    0 3.911457e-01          6030
## 113896                                   0 9.111361e-02          8000
## 11872                                    0 4.207037e-01          1960
## 18650                                    1 3.721142e-02          6583
## 65803                                    0 1.339617e-01          3500
## 11625                                    0 2.453814e-01          4600
## 47567                                    0 3.129851e-01          7600
## 120346                                   0 0.000000e+00          4600
## 9359                                     0 7.551846e-02          7666
## 55629                                    0 2.947544e-01          1200
```

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## 86043                                    0 4.569234e-01          8333
## 122456                                   0 7.295947e-01          1800
## 5308                                     0 2.214631e-01          6000
## 93155                                    0 2.354030e-01          8100
## 27202                                    0 0.000000e+00          4000
## 119765                                   0 2.475012e-01          2100
## 91144                                    0 1.199760e-01          5000
## 113100                                   0 5.110357e-01          5300
## 58313                                    0 2.113302e-01          3600
## 93243                                    0 3.795776e-01          8000
## 88998                                    1 3.493246e-01          2146
## 138099                                   0 5.118438e-03          8400
## 120354                                   0 1.049825e-02          6000
## 100327                                   2 1.326511e+00          3077
## 70513                                    0 1.754612e-01          7750
## 66494                                    0 2.179790e-01          4660
## 19564                                    1 3.885080e-02          3062
## 73785                                    0 0.000000e+00          1700
## 146191                                   0 7.076503e-01          3293
## 74675                                    0 2.141113e-01          3684
## 37351                                    3 4.611954e-01          4483
## 98382                                    0 4.171740e-01          3120
## 79429                                    0 5.422929e-01          8050
## 136697                                   0 5.883322e-01          4250
## 21196                                    0 1.315732e+00          6400
## 134084                                   1 1.155611e-01          4793
## 139861                                   0 5.642718e-01          6666
## 75698                                    0 2.907731e-01          4009
## 5261                                     0 7.087002e-01          6700
## 147384                                   0 9.558088e-02          5000
## 84556                                    0 5.661821e-02          3920
## 99830                                    0 1.493067e-01          3100
## 56685                                    0 1.468401e-01          7531
## 18066                                    0 1.624541e-01          4905
## 123072                                   0 3.412345e-01          4260
## 69949                                    0 0.000000e+00          2358
## 41169                                    0 1.122247e+00          7083
## 43808                                    0 5.977148e-01          4200
## 141100                                   0 5.931019e-01          4580
## 80746                                    0 3.071720e-01          7835
## 9566                                     2 3.669957e-02          3950
## 143870                                   0 2.127193e-01          2735
## 120085                                   2 7.530494e-01          5000
## 20029                                    0 5.309666e-01          3858
## 69356                                    0 1.272438e-02          4400
## 49365                                    0 6.918616e-02          5000
## 982                                      2 4.321196e-01          4750
## 127793                                   0 4.062888e-01          4833
## 125728                                   2 7.907225e-01          3750
## 68947                                    0 6.007451e-01          3220
## 95741                                    0 9.698060e-02          5000
## 77253                                    0 2.458949e+00          2435
## 133375                                   0 1.099443e-01          6284
## 80930                                    0 2.362296e-01          6916
```

```
## 111671                                    0 3.459423e-01          6000
## 104733                                    0 2.704973e-01          7500
## 7585                                      1 5.001412e-01          7083
## 129636                                    0 1.301746e-01          4009
## 136221                                    0 6.030462e-01          2100
## 19338                                     0 6.432749e-03          3419
## 6316                                      0 1.146810e+00          1300
## 80651                                     0 2.442159e-01          3500
## 92565                                     2 3.517047e-01          3900
## 13870                                     0 4.569420e-03          5689
## 135748                                    0 3.139372e-02          5000
## 52342                                     0 5.009754e-01          5125
## 36162                                     0 9.843087e-01          5416
## 118128                                    0 6.446602e-01          7209
## 149006                                    0 1.294058e-01          7858
## 144504                                    0 4.692633e-01          4261
## 148240                                    0 3.115553e-01          2050
## 137523                                    0 2.925878e-03          3075
## 31155                                     0 5.557288e-01          1282
## 28314                                     0 1.364522e-01          4616
## 144595                                    0 2.643259e-01          3018
## 95660                                     0 2.771465e-01          1583
## 19616                                     0 1.739130e-01          6600
## 14435                                     2 1.007158e+00          2374
## 102710                                    0 0.000000e+00          2860
## 42424                                     0 4.625613e-01          6316
## 113283                                    0 8.617410e-01          4100
## 15831                                     1 3.294069e-01          7300
## 123663                                    0 8.059418e-01          4745
## 66522                                     0 5.730337e-01          2580
## 5471                                      0 5.965650e-01          2852
## 110176                                    0 7.173961e-01          4500
## 106788                                    0 1.353963e-01          8692
## 62374                                     4 3.781414e-01          7639
## 15124                                     1 5.504470e-01          2348
## 69062                                     1 4.431138e+00          1001
## 139527                                    0 2.791128e-01          2704
## 42967                                     0 3.398303e-01          4360
## 126758                                    0 3.384105e-01          6630
## 24184                                     1 5.824668e-01          6250
## 11785                                     0 2.872074e-01          4783
## 88117                                     0 1.681025e-03          4758
## 139886                                    0 5.698925e-01           650
## 70696                                     0 1.443542e+00          1230
## 94131                                     0 5.280742e-01          2154
## 138527                                    0 5.694306e-02          1000
## 65576                                     0 4.910000e+02             0
## 25561                                     0 4.100186e-01          4850
## 69066                                     0 2.409398e-01          4000
## 117879                                    0 8.194779e-01          5400
## 88754                                     0 6.397195e-01          2708
## 22908                                     0 1.787642e-01          5000
## 88027                                     0 5.134992e-01          5666
## 2483                                      1 9.389059e-01          3600
```

```
## 75398                                    1 4.159734e-01          600
## 103580                                   0 2.525000e+03            0
## 129065                                   0 1.648473e-01         6320
## 12318                                    0 8.560000e+02            0
## 38773                                    0 2.776749e-01         2700
## 128153                                   0 9.153521e-02         4500
## 9487                                     7 5.989620e-01         4238
## 120722                                   0 4.611837e-03         1300
## 82550                                    0 2.438205e-01         8333
## 128008                                   0 3.107657e-01         6882
## 118580                                   0 4.124501e-01         6264
## 101905                                   0 6.188279e-01         6500
## 124922                                   1 8.515997e-01         1468
## 80219                                    0 4.434958e-01         4450
## 95824                                    0 4.638215e-01         5154
## 17216                                    1 6.141543e-01         2500
## 12847                                    0 7.226084e-01         3020
## 145962                                   0 3.788482e-01         2760
## 42106                                    0 2.038117e-01         5141
## 116724                                   0 3.681818e-01          879
## 123626                                   0 3.185213e-01         2677
## 21114                                    0 6.079030e-04         6579
## 32503                                    0 2.470058e-01         8432
## 94660                                    0 7.795000e+02            1
## 20624                                    0 5.057191e-01         6556
## 87047                                    1 6.151975e-01         5342
## 72542                                    0 1.009863e+00         2331
## 88607                                    0 2.103000e+03            0
## 33979                                    0 1.865277e-01         6813
## 124037                                   0 2.116352e+00         6041
## 130146                                   0 9.271042e-01         5500
## 25215                                    0 4.430199e-01         2807
## 126115                                   0 4.024368e-02         5416
## 106452                                   0 7.156632e-02         4666
## 147212                                   0 8.689487e-01         2044
## 32338                                    1 8.944410e-01         1600
## 10842                                    1 6.271993e-01         4830
## 121233                                   0 2.075834e-01         8333
## 35609                                    1 5.688862e-01         5000
## 17328                                    0 4.255248e-01         3000
## 53581                                    0 1.200500e+03            1
## 9461                                     0 1.099264e+00         3666
## 14827                                    0 3.365471e-01         4459
## 56097                                    0 2.242783e-01         5403
## 101478                                   0 3.299818e-01         7160
## 34015                                    0 1.845787e-01         6717
## 119081                                   0 2.342578e-01         8400
## 24602                                    0 3.721533e-01         5400
## 21542                                    0 2.375654e-01         4583
## 68423                                    0 7.610937e-01         2230
## 110760                                   1 1.087367e+00         3284
## 132053                                   0 6.449532e-03         3100
## 145630                                   0 7.556988e-01         6360
## 110125                                   0 2.692977e-01         6891
```

```
## 93950                                    0 9.998438e-03          6400
## 54179                                    0 2.071464e+00          2000
## 41448                                    1 3.868187e-01          7191
## 73758                                    0 4.371126e-01          5000
## 84675                                    0 2.054208e-01          4205
## 125266                                   0 2.173098e-01          6400
## 89304                                    0 1.414868e+00          1250
## 74658                                    0 1.062849e+00          2147
## 41541                                    0 6.393688e-02          7350
## 12030                                    0 2.448580e-02          4083
## 95655                                    0 6.690827e-01          4000
## 5515                                     0 5.793857e-01          1920
## 62966                                    0 1.971077e-01          5600
## 59828                                    0 2.099580e-02          1666
## 67486                                    0 1.079094e-01          3400
## 127995                                   0 1.449638e-02          4000
## 115338                                   0 8.488960e-04          5889
## 99548                                    0 2.813675e-01          2924
## 119355                                   0 9.090323e-01          1549
## 41098                                    0 2.134788e-01          7700
## 100647                                   0 6.405301e-01          3621
## 101883                                   1 9.246324e-01          2175
## 149692                                   0 6.922012e-02          6500
## 76946                                    0 3.099577e-01          7571
## 79117                                    0 2.923614e-01          6296
## 17417                                    0 1.463707e-01          3333
## 32039                                    0 7.731029e-01          2661
## 33703                                    0 4.204023e-01          7606
## 73591                                    0 3.463751e-01          3475
## 113613                                   0 5.271705e-01          1600
## 88663                                    0 2.123971e-02          2306
## 52158                                    0 3.703704e-01          1754
## 90015                                    0 2.639789e-03          4166
## 143379                                   0 2.154154e-01          5500
## 48326                                    0 2.552993e-01          7500
## 81175                                    0 2.569633e-01          7000
## 131777                                   0 6.406179e-02          2200
## 128891                                   0 3.241352e-01          5000
## 140280                                   1 2.206963e-01          8300
## 84144                                    0 2.294713e-01          8000
## 38160                                    0 4.806117e-01          5492
## 116406                                   0 6.854139e-01          3804
## 52017                                    1 5.167834e-02          8281
## 54999                                    0 3.411614e-01          4683
## 52947                                    0 5.122729e-01          4073
## 85255                                    0 2.369661e-01          7000
## 137183                                   0 4.293927e-01          4000
## 72244                                    0 2.988022e-01          3088
## 145412                                   0 4.302477e-01          2300
## 2489                                     0 7.824268e-01          2150
## 10184                                    0 3.086692e-01          5905
## 147455                                   0 6.409978e-01          7375
## 14273                                    0 3.365985e-01          8166
## 58392                                    0 2.048581e-01          6833
```

```
## 37759                                    0 4.427245e-01          2260
## 62261                                    0 1.300000e+01             0
## 125487                                   0 4.535788e-01          6300
## 131192                                   0 8.937018e-02          4016
## 138055                                   0 5.881295e-01          1667
## 142384                                   0 9.881250e-01          4799
## 135940                                   0 3.444767e-01          5503
## 47488                                    3 1.292109e-01          6500
## 43915                                    0 5.764599e-01          4400
## 146651                                   0 1.006637e-01          3615
## 49179                                    0 1.430956e-03          4192
## 115347                                   0 5.445941e-01          7500
## 109045                                   1 5.191074e-01          7483
## 77977                                    0 2.734188e-01          4600
## 79393                                    0 5.597892e-01          7400
## 67220                                    0 3.048780e-01          5083
## 130868                                   0 3.777482e-01          1500
## 129222                                   0 1.200155e-02          2582
## 124144                                   0 4.002398e-01          6670
## 90027                                    1 2.105183e+00          1311
## 53521                                    0 1.618481e-01          3700
## 107534                                   1 3.356138e-01          5115
## 122838                                   1 3.160415e-01          2505
## 102517                                   0 2.840399e+00           400
## 17073                                    1 3.800291e-01          4125
## 11494                                    1 1.006818e+00          3666
## 110583                                   0 3.292836e-01          7983
## 67522                                    0 7.168805e-01          6000
## 142576                                   0 3.261333e-01          7499
## 15221                                    0 1.780230e-01          4167
## 90523                                    0 1.052034e-01          4400
## 67044                                    0 5.054588e-01          4304
## 100182                                   0 3.212291e-01          8233
## 140550                                   0 2.048916e-01          4333
## 139253                                   0 3.674862e-01          8500
## 68139                                    0 3.642537e-01          7804
## 117266                                   1 1.597739e-01          3360
## 39789                                    0 2.243551e-01          5000
## 109736                                   0 1.364792e-01          7077
## 108901                                   1 1.860836e-01          3132
## 51511                                    0 2.678189e-01          7463
## 131551                                   0 2.682563e-02          4025
## 14655                                    0 2.500000e+01             0
## 139534                                   0 8.305559e-01          7500
## 33230                                    0 6.866603e-01          2083
## 103671                                   0 0.000000e+00          1750
## 98113                                    0 5.710440e-02          5200
## 89753                                    0 1.628106e-02          3500
## 43759                                    0 4.394541e-01          6300
## 53590                                    0 3.428923e-01          5683
## 121763                                   0 8.259691e-02          8486
## 97252                                    0 9.250874e-01          5432
## 120072                                   0 2.240275e-01          6400
## 80695                                    0 5.334412e-01          3707
```

```
## 71457                                    0 7.182208e-02          4900
## 69787                                    0 0.000000e+00          1000
## 30021                                    0 7.915018e-03          4800
## 61780                                    0 1.226714e-01          2844
## 134575                                   0 4.364415e-01          4900
## 69416                                    0 1.585666e+00          3250
## 108905                                   0 4.114091e-01          5293
## 15851                                    0 1.412620e-01          3850
## 62720                                    0 2.905645e-01          4800
## 6869                                     0 8.004798e-01          2500
## 78029                                    0 0.000000e+00          1600
## 55464                                    0 0.000000e+00          2501
## 109478                                   0 1.792938e-01          2916
## 107252                                   0 1.359123e-01          4833
## 131060                                   1 3.163578e-01          7500
## 113256                                   0 3.749063e-03          4000
## 39873                                    0 5.910961e-01          5345
## 38702                                    0 1.989247e-01          7253
## 69894                                    1 6.520535e-01          6500
## 55440                                    0 9.337025e-02          6500
## 10193                                    0 8.246742e-01          5600
## 79147                                    0 4.934301e-01          7990
## 55110                                    0 1.743915e+00          2916
## 4727                                     0 5.126890e-04          3900
## 148985                                   0 6.584774e-02          7000
## 46201                                    0 3.251340e-01          4105
## 55636                                    0 1.446384e+00           400
## 98195                                    0 2.999539e-03          4333
## 47617                                    0 1.525822e-01          4685
## 96196                                    0 1.475800e-04          6775
## 52250                                    0 1.444246e-01          7290
## 144704                                   0 3.096258e-01          3500
## 139148                                   1 7.753062e-01          4000
## 21861                                    0 1.705659e-01          5000
## 115432                                   1 3.794197e-01          4100
## 104033                                   0 7.885443e-01          4416
## 17860                                    0 3.801771e-01          3500
## 72388                                    0 8.014099e-01          6666
## 18887                                    0 1.464065e-01          8250
## 78980                                    0 3.626336e-01          2900
## 125591                                   3 3.234105e-02          2720
## 144770                                   1 2.372663e-01          1550
## 19078                                    0 1.715629e-01           850
## 2499                                     0 0.000000e+00             0
## 100937                                   0 2.267093e-01          2500
## 1552                                     0 1.648470e+00          2417
## 79091                                    0 3.099000e-01          3100
## 30878                                    0 9.797551e-02          4000
## 74084                                    0 4.636070e-04          2156
## 4829                                     0 6.489007e-01          3001
## 38781                                    0 1.329734e-01          5000
## 138533                                   0 3.733057e-01          7229
## 106467                                   0 1.440530e-01          8600
## 114813                                   0 1.943365e-02          1800
```

```
## 6750                                    0 1.344596e-01          5800
## 125435                                  0 8.831861e-03          6000
## 130898                                  0 2.855893e-01          8000
## 68111                                   0 3.719428e-01          6500
## 91274                                   0 4.471711e-01          4400
## 108179                                  0 1.923500e+03             1
## 19542                                   1 3.529412e-01          6000
## 12564                                   0 6.445592e-01          6000
## 76809                                   0 4.493791e-01          4750
## 10058                                   1 2.488876e-01          6741
## 76262                                   0 9.804870e-02          6200
## 124354                                  0 3.891286e-01          3476
## 132122                                  0 2.012736e-01          4396
## 103078                                  0 1.247601e-02          2083
## 148667                                  0 6.346034e-01          1600
## 40353                                   0 9.230200e-04          5416
## 37570                                   0 4.899244e-01          2381
## 119499                                  0 1.351351e-01          5364
## 138016                                  0 5.086983e-01          5000
## 98116                                   0 3.485612e-01          6150
## 11958                                   0 7.636364e-02          6324
## 6374                                    0 4.684545e-01          6450
## 115056                                  0 4.665112e-03          3000
## 99567                                   0 0.000000e+00          6666
## 92451                                   0 1.043115e-03          2875
## 81013                                   0 1.375928e-01          3771
## 61358                                   0 3.137108e-02          8000
## 4276                                    0 6.258551e-01          8624
## 79022                                   0 3.013219e-02          5143
## 125547                                  0 4.492582e-01          3369
## 20489                                   0 5.296915e-01          8200
## 43186                                   1 1.808500e+03             1
## 52732                                   0 1.017536e+00          4333
## 109230                                  0 4.574942e-01          4716
## 135033                                  0 1.079730e-01          4000
## 62749                                   0 2.099078e+00           433
## 122225                                  0 1.934186e-01          6958
## 19209                                   1 6.924391e-02          6440
## 53382                                   0 9.430997e-03          3180
## 106272                                  0 2.981453e-01          7170
## 79468                                   0 5.658585e-01          4000
## 46444                                   0 2.605947e-01          6960
## 64191                                   0 1.944150e-01          2828
## 146049                                  0 7.045070e-02          6500
## 82114                                   1 5.087758e-02          4500
## 7796                                    0 2.641786e-01          8198
## 39915                                   1 7.742062e-01          7652
## 99359                                   1 1.529490e-01          3000
## 83912                                   0 1.242502e-01          3500
## 6056                                    0 0.000000e+00           820
## 134364                                  0 1.016455e-01          4800
## 104825                                  0 5.559170e-01          4917
## 72569                                   3 4.689626e-01          7200
## 110041                                  0 2.923120e-01          7166
```

```
## 117588                                    1 2.761609e-01          4500
## 130078                                    0 3.970158e-01          6500
## 3308                                      0 1.037187e-01          8416
## 5881                                      0 4.789882e-01          5020
## 101426                                    0 1.425657e+00          4411
## 88810                                     0 4.926543e-01          6125
## 120150                                    0 3.951034e-01          4737
## 92694                                     0 1.076509e-01          2600
## 86750                                     1 1.144011e-01          3714
## 112330                                    0 1.509102e-01          8514
## 49286                                     0 3.718513e-02          2500
## 30295                                     2 4.468584e-01          8100
## 67827                                     1 2.484233e-01          6500
## 12424                                     0 7.603262e-02          3800
## 30635                                     0 9.655747e-01          1800
## 24988                                     0 3.875620e-02          2218
## 89915                                     0 3.772028e-01          5333
## 18234                                     0 3.955796e-01          6650
## 78502                                     0 2.027072e+00          2400
## 110480                                    0 1.890268e-01          7654
## 73303                                     0 5.600000e+01             0
## 18715                                     0 1.661782e-01          5800
## 120286                                    0 4.361137e-01          3200
## 4270                                      0 1.218027e-03           820
## 90716                                     0 3.452318e-01          5714
## 31277                                     0 5.523186e-01          5800
## 131724                                    0 3.862017e-01          8000
## 47622                                     0 5.311986e-01          7900
## 7940                                      0 2.352000e+03             0
## 3779                                      0 7.283320e-04          2745
## 87547                                     0 1.580720e-02          3858
## 29971                                     0 1.348692e-01          8333
## 109760                                    0 6.989516e-03          2002
## 19350                                     0 1.224418e-03          5716
## 134571                                    0 3.343351e-01          2661
## 25991                                     0 2.765369e-03          4700
## 37687                                     0 2.832189e-01          8300
## 134951                                    5 3.153348e-01          8333
## 22979                                     1 3.639651e-01          4700
## 122583                                    1 1.129972e+00          4600
## 25628                                     0 2.997612e-01          4606
## 2259                                      0 6.419919e-01          5200
## 140855                                    0 7.325083e-01          2100
## 102182                                    0 7.300000e+01             0
## 9835                                      0 2.471828e-01          2750
## 28460                                     0 4.023994e-02          4000
## 64828                                     0 4.637646e-01          4111
## 102836                                    0 4.149870e-03          8433
## 83942                                     0 1.957608e-01          5000
## 39893                                     0 1.050000e+01             1
## 145905                                    0 3.917217e-01          3333
## 149047                                    0 1.702374e-01          1726
## 59580                                     0 5.692179e-01          8400
## 123210                                    0 1.144007e-01          7700
```

```
## 22023                                    1 6.629213e-01          800
## 25241                                    0 6.248645e-01         2766
## 27705                                    0 2.305210e-04         4337
## 74857                                    0 1.251285e-01         3891
## 45131                                    0 1.803496e-01         3775
## 27185                                    0 9.097181e-01         3333
## 46345                                    0 3.122120e-01         1735
## 76294                                    0 3.327844e-01         8500
## 40481                                    0 7.621103e-01         2084
## 117333                                   0 2.020967e-01         5150
## 147891                                   0 5.351366e-01         3770
## 20878                                    2 7.333154e-01         7416
## 119574                                   0 2.442540e-01         7700
## 132906                                   2 1.149770e-01         5000
## 144147                                   0 1.282599e-01         2338
## 109238                                   0 6.876401e-01         5800
## 88606                                    0 1.481407e+00         2500
## 53640                                    0 3.585876e-01         5833
## 20382                                    0 7.700971e-02         7102
## 49200                                    0 4.193780e-01         6976
## 19203                                    0 2.019192e-01         2500
## 3697                                     0 3.347351e-01         5944
## 115017                                   0 3.208244e-01         3250
## 138718                                   0 6.193421e-01         4042
## 19133                                    0 6.998600e-03         5000
## 7050                                     0 4.506456e-01         2400
## 109528                                   1 6.639785e-01         2975
## 67678                                    0 8.432602e-01         4146
## 57938                                    2 5.351006e-01         4073
## 83126                                    0 4.809107e-01         7202
## 35217                                    0 5.780184e-01         8497
## 46638                                    0 2.265443e-01         7300
## 116233                                   0 1.088075e-01         6800
## 110549                                   0 1.166013e+00          764
## 52286                                    0 3.763498e-01         7500
## 11580                                    0 4.101657e-01         5370
## 105401                                   0 5.788988e-01         3250
## 100401                                   0 3.781282e-01         5833
## 63967                                    2 1.689662e-01         5000
## 73603                                    0 1.942823e-01         6680
## 138842                                   0 2.031117e-01         3534
## 45505                                    3 2.578285e-01         7791
## 111731                                   0 8.845916e-03         4860
## 31373                                    0 8.090240e-01         6382
## 13301                                    0 2.013331e-01         5100
## 3219                                     0 2.666222e-03         6000
## 39001                                    0 8.644975e-01         7283
## 145576                                   0 1.739783e-01         8000
## 126912                                   0 5.515087e-01         5600
## 111136                                   0 6.431306e-01         2350
## 40888                                    0 3.277401e-01         2800
## 52103                                    0 1.306998e-01         4100
## 9319                                     0 1.317447e+00         6000
## 141075                                   0 3.581692e-01         6750
```

```
## 80860                                    0 2.686093e-01          3465
## 132264                                   0 1.832258e-02          3874
## 73850                                    2 3.235642e-01          6755
## 140439                                   0 8.161868e-01          4966
## 143924                                   0 1.591463e-01          3279
## 29827                                    0 4.531985e-03          5736
## 40561                                    0 6.502650e-01          2641
## 73167                                    0 6.515757e-01          6250
## 102892                                   0 1.981336e-01          6000
## 37610                                    0 0.000000e+00          1945
## 122238                                   0 1.906158e-01          3750
## 8836                                     0 9.552134e-01          1428
## 18042                                    0 2.189176e-01          2050
## 38810                                    1 5.767450e-01          5400
## 110738                                   0 2.944704e-01          1500
## 125818                                   0 2.644588e-01          4166
## 146585                                   0 4.364467e-01          3500
## 84456                                    0 1.100000e+01             0
## 20665                                    0 1.089918e-02          1100
## 97755                                    0 3.831234e-01          5000
## 63136                                    1 2.566691e-01          5547
## 23843                                    0 2.131393e-01          6666
## 136491                                   0 1.532135e-01          8510
## 32176                                    0 1.246485e-01          5334
## 83767                                    0 3.391922e-01          5916
## 49119                                    0 2.110642e-02          4500
## 45552                                    0 4.222427e-01          4333
## 57166                                    1 2.767781e-01          2333
## 60465                                    0 3.843198e-02          1300
## 141213                                   0 4.201681e-03          2379
## 145631                                   0 1.431071e-01          8000
## 142511                                   0 5.402299e-01          2000
## 11861                                    0 8.298723e-01          6500
## 52209                                    0 7.867777e-01          7925
## 147588                                   0 1.362884e-01          7850
## 125921                                   0 6.708061e-01          4750
## 133480                                   0 6.420376e-01          4357
## 36557                                    0 1.175944e-01          6700
## 61731                                    0 1.186758e-02          1600
## 110678                                   1 7.613254e-01          3862
## 82919                                    0 3.721541e-01          3425
## 86587                                    0 2.915611e-01          7500
## 100103                                   0 3.882590e-01          6438
## 105662                                   0 7.572897e-02          4766
## 25203                                    0 2.027077e-01          8050
## 30                                       2 4.361025e-01          5500
## 51679                                    0 6.659268e-02           900
## 19161                                    0 2.479417e-01          4250
## 5823                                     0 8.382437e-02          5260
## 134419                                   0 4.796041e-01          3333
## 36095                                    0 1.251094e-01          1142
## 104015                                   0 7.990013e-02           800
## 128011                                   0 5.352357e-01          4029
## 65911                                    0 1.101952e-01          8248
```

```
## 62726                                    0 4.511460e-01          7460
## 1458                                     0 4.240989e-01          3800
## 36320                                    1 4.142544e-01          4110
## 87739                                    0 7.141157e-03          4200
## 47328                                    1 2.489530e-01          2148
## 9641                                     0 6.537890e-01          5383
## 92625                                    0 6.437477e-01          8100
## 91093                                    0 4.544180e-02          7129
## 58609                                    0 4.856762e-01          1500
## 34600                                    0 3.964572e-01          4741
## 90354                                    1 6.797342e+00           300
## 64254                                    0 9.945460e-02          6233
## 107474                                   0 1.615624e-01          4505
## 137390                                   0 3.749063e-03          4000
## 48646                                    0 3.676605e-02          5466
## 26090                                    0 8.643815e-01          4025
## 8226                                     0 1.136543e-02          6334
## 23273                                    0 3.121322e-01          4417
## 80140                                    0 1.444374e-01          4700
## 52922                                    0 0.000000e+00          1800
## 81278                                    0 4.311139e-01          4775
## 132895                                   0 4.570776e-03          7000
## 73898                                    0 1.217127e-02          4600
## 46745                                    0 6.256757e-01          1479
## 27756                                    0 3.046743e-01          4128
## 80940                                    1 7.306287e-03          5200
## 100868                                   0 2.489438e-01          6390
## 13836                                    0 5.880960e-01          6333
## 46930                                    0 3.932425e-01          5652
## 16560                                    0 2.219451e-01           400
## 122308                                   0 5.224129e-01          6000
## 140576                                   0 3.440778e-02          7817
## 143935                                   0 8.038392e-01          5000
## 141918                                   0 8.992101e-01          3164
## 133766                                   0 6.397376e-01          6250
## 88974                                    0 1.320234e-01          2900
## 40730                                    0 3.992897e-01          7883
## 123055                                   0 4.345940e-04          2300
## 21021                                    0 4.216003e-02          5573
## 25100                                    0 4.134780e-01          1750
## 22872                                    0 3.711572e-01          4000
## 96186                                    0 5.951670e-04          8400
## 98415                                    0 1.361257e-01          4583
## 90628                                    0 3.151902e-01          3600
## 90955                                    0 1.329557e-01          3000
## 95241                                    0 2.999814e-01          5366
## 143869                                   0 7.431006e-01          8333
## 82309                                    0 2.068276e-01          7000
## 135332                                   1 5.357857e-02          2500
## 135604                                   0 3.055598e-01          6600
## 108025                                   0 1.105904e-01          3200
## 59663                                    0 3.171652e-01          3710
## 18515                                    0 2.852516e-01          4630
## 105826                                   0 5.031279e-02          7512
```

```
## 36951                                    0 4.456506e-02          7000
## 109217                                   0 4.288928e-01          4000
## 136086                                   0 5.235532e-01          5200
## 67230                                    0 2.739689e-01          7467
## 62333                                    1 4.469106e-01          5000
## 116892                                   0 5.617304e+00           600
## 15338                                    0 5.558964e-01          2933
## 83532                                    0 1.119094e+00          6666
## 29163                                    1 9.100360e-01          2500
## 46098                                    2 4.913570e-01          5032
## 130025                                   0 9.048869e-02          8000
## 99372                                    0 1.834061e-02          3434
## 29495                                    0 1.006112e-01          6380
## 109393                                   0 1.059697e+00          6800
## 66566                                    1 2.494376e-01          4000
## 46646                                    1 2.003589e-01          7800
## 134901                                   0 2.768208e-01          3308
## 2735                                     1 1.474631e-01          4000
## 105575                                   0 2.365694e-01          7333
## 47892                                    1 5.894702e-01          3000
## 20319                                    0 4.116928e-01          5729
## 137379                                   1 2.398506e-01          8300
## 31844                                    1 5.577151e-01          5916
## 97788                                    0 3.205849e-01          8000
## 95220                                    1 9.991460e-02          5854
## 107340                                   0 4.553991e-01          5750
## 49243                                    0 8.888889e-01           800
## 140283                                   0 2.776305e-01          7545
## 132347                                   0 4.319398e-01          5046
## 42100                                    0 2.818706e-01          4682
## 124542                                   0 4.941699e-02          1800
## 142307                                   0 4.251546e-01          4849
## 635                                      0 2.381277e-01          4400
## 20979                                    0 3.333333e-01          1463
## 57693                                    0 4.655767e-01          6666
## 116691                                   0 4.458931e-01          2300
## 18243                                    0 6.784314e-01           764
## 37733                                    0 4.597411e-01          3166
## 104707                                   0 2.360578e-03          3388
## 44576                                    0 1.129626e-01          5700
## 402                                      0 1.158261e-01          7752
## 129316                                   0 4.295427e-01          7500
## 11196                                    0 1.329529e+00          1401
## 23560                                    0 1.500412e-01          2425
## 134411                                   1 7.137759e-03          1400
## 2748                                     0 3.954054e-01          6572
## 47204                                    0 2.416264e-02          6000
## 100517                                   0 1.212684e-01          7000
## 78135                                    0 6.149672e-01          3500
## 76402                                    0 1.857036e-01          4000
## 119579                                   0 4.311063e-01          6480
## 40958                                    2 1.375450e-01          2500
## 59428                                    0 5.026751e-01          8223
## 45824                                    0 1.393407e-01          2274
```

```
## 122220                                    0 6.213447e-01          4000
## 48164                                     0 2.729000e+03             0
## 92733                                     0 2.657196e-02          3800
## 30824                                     0 6.333739e-01           820
## 144809                                    0 4.417117e-01          5000
## 57762                                     0 2.309670e-01          7000
## 43015                                     0 1.130217e+00          4000
## 134399                                    0 3.204420e-01          3800
## 135324                                    0 5.958307e-01          4700
## 106944                                    1 3.827143e-01          7080
## 35877                                     0 1.774592e-01          4045
## 79673                                     0 1.849159e-01          2200
## 75068                                     0 5.194669e-01          2850
## 96021                                     0 5.151470e-01          6667
## 36087                                     1 4.129334e-02          2566
## 20163                                     0 5.917462e-01          4506
## 97068                                     0 1.105378e+00          1375
## 78088                                     0 1.748804e+00           417
## 49928                                     0 5.459891e-03          2380
## 140255                                    0 3.732080e-01          8300
## 44922                                     0 1.365639e-01          1815
## 110621                                    0 8.331940e-04          6000
## 122490                                    0 7.173298e-01          5302
## 31165                                     0 2.171710e+00          1420
## 145684                                    0 2.088924e-01          3800
## 113131                                    3 9.501615e-01          4333
## 110014                                    0 1.721455e+00           796
## 147310                                    0 1.854525e-01          1800
## 1848                                      0 7.658963e-01          8004
## 144224                                    0 0.000000e+00          2640
## 108903                                    0 1.106693e-01          3017
## 45642                                     0 5.466133e-01          4000
## 94594                                     0 2.070944e-01          3833
## 81187                                     0 1.578670e-02          5700
## 78075                                     0 2.230453e-01          2429
## 107718                                    0 8.281430e-01          2600
## 123180                                    0 4.082810e-01          7800
## 91698                                     0 8.634734e-01          3903
##        NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 35580                               10                       0
## 46953                               10                       0
## 52453                                5                       0
## 24027                               12                       0
## 1521                                18                       0
## 61774                               15                       0
## 57130                               12                       0
## 80283                                3                       0
## 145496                               9                       0
## 46162                                9                       0
## 19398                                7                       0
## 88300                               18                       0
## 7429                                12                       0
## 42092                                4                       0
## 105437                               3                       0
```

```
## 15786                                  4                        0
## 146690                                 5                        0
## 140730                                 7                        0
## 46821                                 13                        0
## 58102                                 12                        0
## 137929                                11                        0
## 64582                                  3                        0
## 42318                                  3                        0
## 52970                                 15                        0
## 12848                                  7                        0
## 47977                                  8                        0
## 76624                                 11                        0
## 68296                                 10                        0
## 59573                                  6                        0
## 25961                                 15                        0
## 67477                                  8                        0
## 120588                                 6                        0
## 14289                                  4                        0
## 131394                                 6                        0
## 108140                                 5                        0
## 45005                                  9                        0
## 21012                                  6                        0
## 149334                                15                        0
## 48644                                  7                        0
## 18405                                  3                        0
## 62018                                 10                        0
## 134377                                 4                        0
## 59971                                  2                        0
## 16834                                  2                        0
## 24349                                 13                        0
## 65634                                  8                        0
## 132439                                12                        0
## 129102                                 4                        0
## 84842                                  6                        0
## 25367                                  6                        0
## 69526                                  6                        0
## 127629                                11                        0
## 130867                                15                        0
## 53803                                 12                        0
## 140520                                 6                        0
## 8598                                  10                        0
## 22097                                  4                        0
## 41262                                  7                        0
## 128569                                12                        0
## 65612                                 11                        0
## 12510                                  9                        1
## 59602                                  3                        0
## 123838                                 1                        0
## 91758                                  8                        0
## 43316                                  8                        0
## 46064                                  5                        0
## 103290                                 4                        0
## 106964                                 9                        0
## 64264                                  6                        0
```

```
## 136198                                  8                        0
## 104056                                  7                        0
## 82370                                   3                        0
## 100651                                 10                        0
## 100839                                 14                        0
## 22793                                  11                        0
## 146335                                  2                        0
## 58469                                   5                        0
## 63622                                   3                        0
## 50792                                   4                        0
## 20230                                  10                        0
## 35691                                   7                        0
## 145813                                  2                        0
## 60388                                   3                        0
## 38157                                   7                        0
## 83580                                   4                        0
## 81508                                   5                        0
## 14108                                   7                        0
## 86628                                   7                        0
## 60348                                   7                        0
## 13906                                   4                        0
## 30467                                   9                        0
## 135337                                  8                        0
## 90586                                  17                        0
## 15862                                   9                        0
## 145689                                 13                        0
## 69899                                   6                        0
## 110190                                  7                        0
## 101006                                  7                        0
## 117549                                  1                        0
## 25395                                   7                        0
## 13715                                  12                        0
## 63920                                   7                        0
## 35383                                   9                        0
## 39419                                   7                        2
## 104925                                  2                        0
## 2005                                   11                        0
## 91013                                   2                        0
## 106956                                  5                        0
## 116549                                  8                        0
## 136746                                 14                        0
## 96796                                   5                        0
## 30629                                   4                        0
## 73382                                  24                        0
## 90238                                   5                        0
## 125086                                  3                        0
## 1277                                    3                        0
## 26226                                  11                        0
## 20789                                  10                        0
## 6967                                   10                        0
## 3139                                    6                        0
## 136776                                  8                        0
## 77752                                   8                        0
## 95117                                   4                        0
```

```
## 3710                                  6                        0
## 83449                                 5                        0
## 97425                                13                        0
## 148776                                4                        0
## 99915                                 5                        0
## 36781                                 5                        0
## 10537                                17                        0
## 67045                                 6                        0
## 71089                                 4                        0
## 54096                                 6                        1
## 99962                                11                        0
## 61211                                 9                        1
## 30218                                 6                        0
## 52036                                 2                        0
## 10089                                 7                        0
## 39129                                 0                        1
## 11238                                10                        0
## 140972                                3                        0
## 146581                               14                        0
## 128262                                9                        0
## 149596                               12                        0
## 5168                                 23                        0
## 142800                                8                        0
## 109385                                9                        0
## 11779                                 8                        0
## 4169                                  7                        0
## 87546                                 4                        0
## 105612                                7                        0
## 40172                                 2                        0
## 97179                                13                        0
## 72936                                 3                        0
## 140856                               12                        0
## 95437                                 2                        1
## 59486                                10                        0
## 90546                                12                        1
## 41040                                28                        0
## 102471                                5                        0
## 68699                                 4                        0
## 99513                                 8                        0
## 124044                                9                        1
## 31164                                19                        0
## 53572                                 5                        0
## 127885                                8                        0
## 124506                                6                        0
## 79691                                 5                        0
## 81492                                 7                        0
## 103067                                4                        0
## 42238                                 7                        0
## 64952                                 4                        0
## 44757                                 4                        0
## 104418                               11                        0
## 81694                                 3                        0
## 79257                                10                        0
## 82074                                11                        0
```

```
## 49638                                  6                        0
## 80741                                  8                        0
## 115809                                 4                        0
## 96165                                 12                        0
## 17253                                  5                        0
## 108834                                 9                        0
## 85185                                  7                        0
## 3310                                   8                        0
## 74657                                 10                        0
## 31402                                 12                        0
## 4124                                  17                        0
## 24356                                 14                        0
## 122869                                 2                        1
## 31798                                  7                        0
## 19618                                  9                        0
## 92874                                 19                        0
## 69078                                 13                        0
## 64331                                  8                        0
## 18632                                  7                        0
## 120866                                 7                        0
## 29466                                 13                        0
## 58537                                 12                        0
## 6639                                   7                        0
## 82040                                 12                        0
## 91052                                  1                        0
## 13759                                  8                        0
## 72625                                  7                        0
## 73541                                  8                        0
## 104924                                 8                        0
## 63784                                 12                        0
## 106701                                 7                        0
## 140150                                 6                        0
## 18796                                  4                        0
## 41852                                  5                        0
## 85465                                  1                        0
## 51519                                 13                        0
## 2879                                   2                        0
## 98506                                  9                        0
## 33754                                 12                        0
## 61219                                 14                        0
## 126327                                12                        0
## 17503                                  9                        0
## 70778                                  4                        0
## 109741                                11                        0
## 143027                                18                        0
## 12497                                 17                        0
## 87836                                 16                        0
## 61532                                  5                        1
## 4278                                   7                        0
## 117571                                 5                        0
## 98762                                  4                        0
## 131682                                 9                        0
## 126181                                 5                        0
## 10778                                 11                        0
```

```
## 143293                    8                    0
## 4666                     13                    0
## 6631                     15                    0
## 20940                    30                    0
## 57355                    12                    0
## 8380                     21                    0
## 34667                     1                    0
## 63550                    12                    0
## 25058                     2                    0
## 35869                     9                    0
## 53291                     3                    0
## 106189                    8                    0
## 104325                    7                    0
## 63167                     4                    0
## 64112                     6                    0
## 145282                    7                    0
## 144139                    3                    0
## 52631                    12                    0
## 131645                   11                    0
## 75053                    13                    0
## 21321                     7                    0
## 74091                    11                    0
## 110825                    4                    0
## 33270                    10                    0
## 62172                     7                    0
## 149500                   12                    0
## 47860                     3                    0
## 32217                     4                    0
## 4594                     11                    0
## 97023                    12                    0
## 45501                     4                    0
## 19970                    13                    0
## 145012                    4                    0
## 46570                     6                    0
## 57788                    10                    0
## 61960                     6                    0
## 4370                     20                    0
## 65064                    10                    0
## 22525                     8                    0
## 16184                     6                    1
## 20937                     5                    0
## 122894                   14                    0
## 9809                     22                    0
## 121191                   10                    0
## 64812                    17                    0
## 91455                    10                    0
## 40971                     5                    0
## 116730                    6                    0
## 50615                     1                    0
## 114321                    9                    0
## 27566                    16                    0
## 109724                    4                    0
## 5152                      9                    0
## 27654                     4                    0
```

```
## 116889                    8                    6
## 134404                    5                    0
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## 25628                                    7                    0
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## 149047                                   3                    0
## 59580                                   17                    0
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## 22023                                   12                    0
## 25241                                   12                    0
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## 27185                                    7                    0
## 46345                                    3                    0
## 76294                                   17                    0
## 40481                                    6                    0
## 117333                                   3                    0
```

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## 3697                      14                    0
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## 109528                     8                    0
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## 35217                     14                    0
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## 11580                      6                    0
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## 29827                      2                    0
## 40561                     19                    0
## 73167                      7                    0
## 102892                    11                    0
## 37610                      3                    0
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```
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## 92625                    17                    0
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## 58609                     5                    0
## 34600                     8                    0
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```
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## 83532                                20                    0
## 29163                                11                    0
## 46098                                 7                    0
```

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## 135324                   20                    0
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```

```
## 35877                                  2                        0
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## 110014                                 6                        0
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## 81187                                  5                        0
## 78075                                  4                        0
## 107718                                32                        0
## 123180                                22                        0
## 91698                                 12                        0
##        NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 35580                             2                                    1
## 46953                             1                                    0
## 52453                             1                                    0
## 24027                             1                                    0
## 1521                              3                                    0
## 61774                             3                                    0
## 57130                             0                                    0
## 80283                             0                                    0
## 145496                            4                                    0
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## 19398                             1                                    0
## 88300                             2                                    0
## 7429                              2                                    2
## 42092                             0                                    1
## 105437                            0                                    0
## 15786                             0                                    0
## 146690                            1                                    0
## 140730                            2                                    0
## 46821                             2                                    0
## 58102                             2                                    0
## 137929                            2                                    0
## 64582                             0                                    0
## 42318                             0                                    0
## 52970                             1                                    0
## 12848                             2                                    0
```

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## 47977                                0                                0
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## 68296                                3                                0
## 59573                                0                                0
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## 67477                                1                                0
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## 14289                                1                                0
## 131394                               1                                0
## 108140                               1                                0
## 45005                                2                                0
## 21012                                1                                0
## 149334                               1                                0
## 48644                                1                                0
## 18405                                1                                0
## 62018                                1                                0
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## 59971                                0                                0
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## 130867                               0                                0
## 53803                                2                                0
## 140520                               2                                0
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## 59602                                1                                0
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## 82370                                0                                0
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## 100839                               1                                0
## 22793                                2                                0
## 146335                               0                                0
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## 63622                                2                                0
## 50792                                0                                0
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## 95117                    1                    0
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## 97425                    1                    0
## 148776                   1                    0
## 99915                    0                    0
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## 10537                    1                    0
## 67045                    0                    0
## 71089                    1                    0
## 54096                    0                    0
```

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## 99962                                    1                                    0
## 61211                                    2                                    0
## 30218                                    2                                    0
## 52036                                    0                                    0
## 10089                                    2                                    0
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## 11238                                    2                                    0
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## 146581                                   1                                    1
## 128262                                   2                                    0
## 149596                                   0                                    1
## 5168                                     2                                    0
## 142800                                   0                                    0
## 109385                                   3                                    0
## 11779                                    1                                    0
## 4169                                     2                                    0
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## 105612                                   0                                    0
## 40172                                    0                                    2
## 97179                                    1                                    0
## 72936                                    1                                    0
## 140856                                   2                                    0
## 95437                                    0                                    0
## 59486                                    0                                    0
## 90546                                    0                                    0
## 41040                                    0                                    0
## 102471                                   1                                    0
## 68699                                    0                                    0
## 99513                                    0                                    0
## 124044                                   1                                    0
## 31164                                    1                                    0
## 53572                                    0                                    0
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## 79691                                    1                                    0
## 81492                                    1                                    0
## 103067                                   0                                    0
## 42238                                    0                                    0
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## 44757                                    0                                    0
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## 81694                                    1                                    0
## 79257                                    2                                    0
## 82074                                    1                                    0
## 49638                                    2                                    0
## 80741                                    1                                    0
## 115809                                   1                                    0
## 96165                                    2                                    0
## 17253                                    1                                    0
## 108834                                   1                                    0
## 85185                                    0                                    0
## 3310                                     1                                    1
## 74657                                    0                                    0
## 31402                                    1                                    0
```

```
## 4124                                    1                                    0
## 24356                                   3                                    0
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## 31798                                   1                                    0
## 19618                                   1                                    0
## 92874                                   2                                    0
## 69078                                   2                                    0
## 64331                                   1                                    0
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## 29466                                   1                                    0
## 58537                                   1                                    0
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## 13759                                   2                                    0
## 72625                                   0                                    0
## 73541                                   1                                    0
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## 41852                                   1                                    0
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## 51519                                   1                                    0
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## 33754                                   0                                    0
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## 87836                                   2                                    0
## 61532                                   1                                    0
## 4278                                    1                                    0
## 117571                                  0                                    0
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## 126181                                  0                                    0
## 10778                                   0                                    0
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## 4666                                    1                                    0
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## 8380                                    3                                    1
## 34667                                   0                                    0
## 63550                                   3                                    0
## 25058                                   0                                    0
## 35869                                   1                                    0
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## 62172                    3                    0
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## 19970                    1                    0
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## 46570                    2                    0
## 57788                    1                    0
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## 109724                   2                    0
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## 129191                   1                    0
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## 92858                    2                    0
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```

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## 74228                                    0                                    1
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## 39838                                    1                                    0
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## 10264                                    1                                    0
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## 125563                                   1                                    0
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## 112822                    2                    0
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```

```
## 47502                                    2                                    0
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## 59435                                    1                                    0
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## 47462                                    2                                    0
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## 16678                                    0                                    0
## 59243                                    0                                    0
## 53349                                    0                                    0
## 112348                                   1                                    0
```

```
## 11230                                2                                0
## 144130                               2                                0
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## 27185                                    1                                    0
## 46345                                    0                                    0
## 76294                                    1                                    0
## 40481                                    2                                    0
## 117333                                   1                                    0
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## 20878                                    1                                    0
## 119574                                   1                                    0
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## 144147                                   0                                    0
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## 53640                                    2                                    0
## 20382                                    0                                    0
## 49200                                    1                                    0
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## 84456                                    0                                    0
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## 97755                                    1                                    0
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## 52922                                    0                                    0
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## 105575                                   1                                    0
## 47892                                    1                                    0
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## 48164                                    1                                    0
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## 144809                                   1                                    0
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## 135324                                   2                                    0
## 106944                                   2                                    0
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## 96021                                    2                                    0
## 36087                                    0                                    1
## 20163                                    2                                    0
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## 78088                                    1                                    0
## 49928                                    0                                    0
## 140255                                   1                                    0
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## 107718                               1                                    0
## 123180                               1                                    0
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## 7429                    0       3
## 42092                   0       3
## 105437                  0       3
## 15786                   0       3
## 146690                  0       3
## 140730                  0       3
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## 58102                   0       3
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## 64582                   0       3
## 42318                   1       3
## 52970                   1       3
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## 59573                   0       3
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## 120588                  1       3
## 14289                   0       3
## 131394                  0       3
## 108140                  1       3
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## 127629                   0        3
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## 123838                   2        3
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## 86628                    0        3
## 60348                    0        3
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## 39419                    0        3
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## 30629                    0        3
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## 95117                    2        3
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## 97425                    0        3
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## 99915                    0        3
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## 67045                    0        3
## 71089                    0        3
## 54096                    0        3
## 99962                    0        3
## 61211                    0        3
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## 39129                    0        3
## 11238                    0        3
## 140972                   1        3
## 146581                   1        3
## 128262                   0        3
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## 40172                     0        3
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## 72936                     1        3
## 140856                    0        3
## 95437                     1        3
## 59486                     0        3
## 90546                     0        3
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## 102471                    2        3
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## 99513                     2        3
## 124044                    2        3
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## 53572                     0        3
## 127885                    0        3
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## 79691                     0        3
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## 64952                     0        3
## 44757                     0        3
## 104418                    0        3
## 81694                     0        3
## 79257                     0        3
## 82074                     0        3
## 49638                     0        3
## 80741                     2        3
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## 17253                     0        3
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## 85185                     1        3
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## 74657                     0        3
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## 4124                      0        3
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## 64331                     0        3
## 18632                     0        3
## 120866                    3        3
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## 143027                   3        3
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## 35869                    2        3
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## 144139                   0        3
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## 75053                    0        3
```

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## 64812                    0        3
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## 50615                    0        3
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## 5152                     0        3
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## 77353                    0        3
## 74228                    0        3
## 98536                    0        3
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## 138162                   0        3
## 68447                    0        3
## 51945                    0        3
## 45921                    2        3
## 23368                    1        3
## 138970                   4        3
## 92313                    4        3
```

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## 69283                     0        3
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## 39838                     0        3
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## 53591                    0        3
```

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## 15108                     2        3
## 66502                     2        3
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## 64496                    0        3
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## 99868                    1        3
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## 147648                   1        3
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## 39734                    0        3
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## 85533                     2        3
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## 103843                    0        3
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## 74642                     0        3
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## 107323                    0        3
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## 122460                    0        3
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## 53363                     0        3
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## 106497                    0        3
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## 99830                    0        3
## 56685                    0        3
## 18066                    0        3
## 123072                   0        3
## 69949                    0        3
## 41169                    0        3
## 43808                    0        3
## 141100                   0        3
## 80746                    6        3
## 9566                     3        3
## 143870                   0        3
## 120085                   0        3
## 20029                    1        3
## 69356                    0        3
## 49365                    0        3
## 982                      0        3
## 127793                   1        3
## 125728                   2        3
## 68947                    2        3
## 95741                    0        3
## 77253                    1        3
## 133375                   0        3
## 80930                    0        3
## 111671                   1        3
## 104733                   3        3
## 7585                     0        3
## 129636                   2        3
## 136221                   3        3
## 19338                    0        3
## 6316                     0        3
## 80651                    0        3
## 92565                    0        3
## 13870                    0        3
## 135748                   0        3
## 52342                    0        3
## 36162                    2        3
## 118128                   0        3
## 149006                   0        3
## 144504                   0        3
## 148240                   1        3
## 137523                   1        3
## 31155                    0        3
## 28314                    0        3
## 144595                   3        3
## 95660                    0        3
## 19616                    0        3
## 14435                    0        3
## 102710                   0        3
## 42424                    0        3
## 113283                   2        3
## 15831                    0        3
## 123663                   0        3
## 66522                    0        3
```

```
## 5471                    0        3
## 110176                  2        3
## 106788                  2        3
## 62374                   2        3
## 15124                   0        3
## 69062                   2        3
## 139527                  0        3
## 42967                   0        3
## 126758                  0        3
## 24184                   0        3
## 11785                   0        3
## 88117                   0        3
## 139886                  0        3
## 70696                   0        3
## 94131                   0        3
## 138527                  0        3
## 65576                   0        3
## 25561                   3        3
## 69066                   0        3
## 117879                  1        3
## 88754                   0        3
## 22908                   2        3
## 88027                   1        3
## 2483                    1        3
## 75398                   0        3
## 103580                  4        3
## 129065                  0        3
## 12318                   5        3
## 38773                   0        3
## 128153                  3        3
## 9487                    0        3
## 120722                  0        3
## 82550                   0        3
## 128008                  0        3
## 118580                  0        3
## 101905                  1        3
## 124922                  0        3
## 80219                   1        3
## 95824                   4        3
## 17216                   2        3
## 12847                   1        3
## 145962                  0        3
## 42106                   1        3
## 116724                  0        3
## 123626                  0        3
## 21114                   0        3
## 32503                   2        3
## 94660                   2        3
## 20624                   0        3
## 87047                   2        3
## 72542                   0        3
## 88607                   2        3
## 33979                   0        3
## 124037                  1        3
```

```
## 130146                    2        3
## 25215                     2        3
## 126115                    0        3
## 106452                    0        3
## 147212                    1        3
## 32338                     2        3
## 10842                     0        3
## 121233                    0        3
## 35609                     0        3
## 17328                     2        3
## 53581                     1        3
## 9461                      1        3
## 14827                     0        3
## 56097                     0        3
## 101478                    0        3
## 34015                     1        3
## 119081                    0        3
## 24602                     0        3
## 21542                     0        3
## 68423                     0        3
## 110760                    2        3
## 132053                    0        3
## 145630                    0        3
## 110125                    1        3
## 93950                     2        3
## 54179                     3        3
## 41448                     2        3
## 73758                     3        3
## 84675                     2        3
## 125266                    1        3
## 89304                     0        3
## 74658                     0        3
## 41541                     2        3
## 12030                     0        3
## 95655                     2        3
## 5515                      4        3
## 62966                     0        3
## 59828                     0        3
## 67486                     0        3
## 127995                    0        3
## 115338                    0        3
## 99548                     2        3
## 119355                    0        3
## 41098                     2        3
## 100647                    0        3
## 101883                    2        3
## 149692                    0        3
## 76946                     1        3
## 79117                     1        3
## 17417                     0        3
## 32039                     0        3
## 33703                     1        3
## 73591                     2        3
## 113613                    0        3
```

```
## 88663                    0        3
## 52158                    4        3
## 90015                    0        3
## 143379                   1        3
## 48326                    0        3
## 81175                    1        3
## 131777                   0        3
## 128891                   4        3
## 140280                   0        3
## 84144                    0        3
## 38160                    0        3
## 116406                   0        3
## 52017                    2        3
## 54999                    1        3
## 52947                    0        3
## 85255                    2        3
## 137183                   2        3
## 72244                    0        3
## 145412                   2        3
## 2489                     1        3
## 10184                    0        3
## 147455                   1        3
## 14273                    1        3
## 58392                    1        3
## 37759                    0        3
## 62261                    0        3
## 125487                   1        3
## 131192                   2        3
## 138055                   0        3
## 142384                   0        3
## 135940                   4        3
## 47488                    0        3
## 43915                    4        3
## 146651                   0        3
## 49179                    0        3
## 115347                   4        3
## 109045                   1        3
## 77977                    2        3
## 79393                    2        3
## 67220                    0        3
## 130868                   0        3
## 129222                   0        3
## 124144                   2        3
## 90027                    0        3
## 53521                    0        3
## 107534                   0        3
## 122838                   0        3
## 102517                   2        3
## 17073                    0        3
## 11494                    0        3
## 110583                   3        3
## 67522                    0        3
## 142576                   0        3
## 15221                    0        3
```

```
## 90523                    0        3
## 67044                    0        3
## 100182                   1        3
## 140550                   0        3
## 139253                   2        3
## 68139                    2        3
## 117266                   0        3
## 39789                    0        3
## 109736                   0        3
## 108901                   0        3
## 51511                    2        3
## 131551                   0        3
## 14655                    0        3
## 139534                   0        3
## 33230                    0        3
## 103671                   0        3
## 98113                    0        3
## 89753                    0        3
## 43759                    2        3
## 53590                    1        3
## 121763                   0        3
## 97252                    0        3
## 120072                   0        3
## 80695                    1        3
## 71457                    0        3
## 69787                    0        3
## 30021                    0        3
## 61780                    2        3
## 134575                   1        3
## 69416                    0        3
## 108905                   2        3
## 15851                    0        3
## 62720                    0        3
## 6869                     0        3
## 78029                    0        3
## 55464                    0        3
## 109478                   0        3
## 107252                   0        3
## 131060                   3        3
## 113256                   0        3
## 39873                    3        3
## 38702                    3        3
## 69894                    4        3
## 55440                    2        3
## 10193                    3        3
## 79147                    3        3
## 55110                    3        3
## 4727                     0        3
## 148985                   0        3
## 46201                    0        3
## 55636                    0        3
## 98195                    0        3
## 47617                    0        3
## 96196                    3        3
```

```
## 52250                    3        3
## 144704                   0        3
## 139148                   0        3
## 21861                    1        3
## 115432                   0        3
## 104033                   0        3
## 17860                    0        3
## 72388                    0        3
## 18887                    0        3
## 78980                    0        3
## 125591                   1        3
## 144770                   0        3
## 19078                    1        3
## 2499                     0        3
## 100937                   0        3
## 1552                     0        3
## 79091                    0        3
## 30878                    0        3
## 74084                    0        3
## 4829                     0        3
## 38781                    0        3
## 138533                   3        3
## 106467                   0        3
## 114813                   0        3
## 6750                     0        3
## 125435                   0        3
## 130898                   0        3
## 68111                    0        3
## 91274                    2        3
## 108179                   1        3
## 19542                    2        3
## 12564                    0        3
## 76809                    2        3
## 10058                    2        3
## 76262                    1        3
## 124354                   0        3
## 132122                   1        3
## 103078                   0        3
## 148667                   0        3
## 40353                    0        3
## 37570                    0        3
## 119499                   3        3
## 138016                   0        3
## 98116                    0        3
## 11958                    1        3
## 6374                     3        3
## 115056                   0        3
## 99567                    0        3
## 92451                    3        3
## 81013                    0        3
## 61358                    1        3
## 4276                     2        3
## 79022                    0        3
## 125547                   0        3
```

```
## 20489                    0        3
## 43186                    3        3
## 52732                    0        3
## 109230                   1        3
## 135033                   0        3
## 62749                    1        3
## 122225                   1        3
## 19209                    0        3
## 53382                    0        3
## 106272                   0        3
## 79468                    0        3
## 46444                    1        3
## 64191                    1        3
## 146049                   0        3
## 82114                    0        3
## 7796                     1        3
## 39915                    1        3
## 99359                    0        3
## 83912                    0        3
## 6056                     0        3
## 134364                   3        3
## 104825                   0        3
## 72569                    3        3
## 110041                   0        3
## 117588                   0        3
## 130078                   1        3
## 3308                     0        3
## 5881                     2        3
## 101426                   1        3
## 88810                    0        3
## 120150                   0        3
## 92694                    3        3
## 86750                    0        3
## 112330                   2        3
## 49286                    0        3
## 30295                    2        3
## 67827                    3        3
## 12424                    0        3
## 30635                    0        3
## 24988                    0        3
## 89915                    0        3
## 18234                    0        3
## 78502                    1        3
## 110480                   2        3
## 73303                    2        3
## 18715                    0        3
## 120286                   0        3
## 4270                     0        3
## 90716                    3        3
## 31277                    0        3
## 131724                   3        3
## 47622                    0        3
## 7940                     2        3
## 3779                     0        3
```

```
## 87547                    1        3
## 29971                    0        3
## 109760                   0        3
## 19350                    0        3
## 134571                   2        3
## 25991                    0        3
## 37687                    0        3
## 134951                   0        3
## 22979                    0        3
## 122583                   1        3
## 25628                    0        3
## 2259                     0        3
## 140855                   0        3
## 102182                   0        3
## 9835                     0        3
## 28460                    0        3
## 64828                    1        3
## 102836                   1        3
## 83942                    3        3
## 39893                    2        3
## 145905                   0        3
## 149047                   0        3
## 59580                    1        3
## 123210                   1        3
## 22023                    0        3
## 25241                    0        3
## 27705                    0        3
## 74857                    1        3
## 45131                    0        3
## 27185                    0        3
## 46345                    0        3
## 76294                    4        3
## 40481                    0        3
## 117333                   2        3
## 147891                   0        3
## 20878                    1        3
## 119574                   0        3
## 132906                   0        3
## 144147                   0        3
## 109238                   2        3
## 88606                    0        3
## 53640                    1        3
## 20382                    0        3
## 49200                    2        3
## 19203                    2        3
## 3697                     2        3
## 115017                   0        3
## 138718                   2        3
## 19133                    2        3
## 7050                     1        3
## 109528                   0        3
## 67678                    1        3
## 57938                    2        3
## 83126                    0        3
```

```
## 35217                    2        3
## 46638                    0        3
## 116233                   0        3
## 110549                   0        3
## 52286                    3        3
## 11580                    1        3
## 105401                   2        3
## 100401                   2        3
## 63967                    1        3
## 73603                    1        3
## 138842                   0        3
## 45505                    0        3
## 111731                   1        3
## 31373                    1        3
## 13301                    2        3
## 3219                     0        3
## 39001                    1        3
## 145576                   0        3
## 126912                   0        3
## 111136                   0        3
## 40888                    0        3
## 52103                    3        3
## 9319                     0        3
## 141075                   0        3
## 80860                    0        3
## 132264                   1        3
## 73850                    3        3
## 140439                   1        3
## 143924                   4        3
## 29827                    0        3
## 40561                    2        3
## 73167                    3        3
## 102892                   0        3
## 37610                    0        3
## 122238                   0        3
## 8836                     0        3
## 18042                    0        3
## 38810                    2        3
## 110738                   0        3
## 125818                   0        3
## 146585                   0        3
## 84456                    0        3
## 20665                    0        3
## 97755                    2        3
## 63136                    3        3
## 23843                    1        3
## 136491                   3        3
## 32176                    0        3
## 83767                    0        3
## 49119                    0        3
## 45552                    1        3
## 57166                    4        3
## 60465                    0        3
## 141213                   0        3
```

```
## 145631                    4        3
## 142511                    0        3
## 11861                     1        3
## 52209                     0        3
## 147588                    0        3
## 125921                    3        3
## 133480                    1        3
## 36557                     0        3
## 61731                     1        3
## 110678                    0        3
## 82919                     0        3
## 86587                     3        3
## 100103                    2        3
## 105662                    1        3
## 25203                     0        3
## 30                        0        3
## 51679                     0        3
## 19161                     2        3
## 5823                      0        3
## 134419                    1        3
## 36095                     0        3
## 104015                    2        3
## 128011                    0        3
## 65911                     3        3
## 62726                     1        3
## 1458                      0        3
## 36320                     0        3
## 87739                     0        3
## 47328                     0        3
## 9641                      0        3
## 92625                     4        3
## 91093                     0        3
## 58609                     0        3
## 34600                     2        3
## 90354                     1        3
## 64254                     0        3
## 107474                    3        3
## 137390                    0        3
## 48646                     0        3
## 26090                     0        3
## 8226                      0        3
## 23273                     2        3
## 80140                     4        3
## 52922                     0        3
## 81278                     0        3
## 132895                    0        3
## 73898                     0        3
## 46745                     0        3
## 27756                     0        3
## 80940                     1        3
## 100868                    1        3
## 13836                     3        3
## 46930                     1        3
## 16560                     0        3
```

```
## 122308                    1        3
## 140576                    1        3
## 143935                    0        3
## 141918                    0        3
## 133766                    0        3
## 88974                     2        3
## 40730                     1        3
## 123055                    0        3
## 21021                     1        3
## 25100                     3        3
## 22872                     0        3
## 96186                     1        3
## 98415                     2        3
## 90628                     1        3
## 90955                     1        3
## 95241                     0        3
## 143869                    0        3
## 82309                     0        3
## 135332                    1        3
## 135604                    2        3
## 108025                    0        3
## 59663                     3        3
## 18515                     1        3
## 105826                    0        3
## 36951                     0        3
## 109217                    4        3
## 136086                    1        3
## 67230                     0        3
## 62333                     3        3
## 116892                    2        3
## 15338                     3        3
## 83532                     0        3
## 29163                     0        3
## 46098                     2        3
## 130025                    8        3
## 99372                     0        3
## 29495                     2        3
## 109393                    2        3
## 66566                     2        3
## 46646                     1        3
## 134901                    3        3
## 2735                      0        3
## 105575                    2        3
## 47892                     0        3
## 20319                     2        3
## 137379                    0        3
## 31844                     1        3
## 97788                     0        3
## 95220                     3        3
## 107340                    1        3
## 49243                     2        3
## 140283                    5        3
## 132347                    3        3
## 42100                     0        3
```

```
## 124542                    1        3
## 142307                    0        3
## 635                       1        3
## 20979                     2        3
## 57693                     1        3
## 116691                    0        3
## 18243                     0        3
## 37733                     0        3
## 104707                    0        3
## 44576                     1        3
## 402                       2        3
## 129316                    1        3
## 11196                     2        3
## 23560                     0        3
## 134411                    1        3
## 2748                      3        3
## 47204                     3        3
## 100517                    2        3
## 78135                     1        3
## 76402                     0        3
## 119579                    0        3
## 40958                     0        3
## 59428                     2        3
## 45824                     0        3
## 122220                    3        3
## 48164                     5        3
## 92733                     0        3
## 30824                     0        3
## 144809                    2        3
## 57762                     3        3
## 43015                     0        3
## 134399                    0        3
## 135324                    0        3
## 106944                    2        3
## 35877                     1        3
## 79673                     1        3
## 75068                     1        3
## 96021                     5        3
## 36087                     0        3
## 20163                     0        3
## 97068                     0        3
## 78088                     0        3
## 49928                     0        3
## 140255                    2        3
## 44922                     1        3
## 110621                    0        3
## 122490                    3        3
## 31165                     3        3
## 145684                    0        3
## 113131                    0        3
## 110014                    0        3
## 147310                    0        3
## 1848                      0        3
## 144224                    1        3
```

```
## 108903                  0       3
## 45642                   0       3
## 94594                   1       3
## 81187                   1       3
## 78075                   0       3
## 107718                  1       3
## 123180                  2       3
## 91698                   1       3
```

```
nrow(Sample3)
```

```
## [1] 3823
```

```
Sample5 <- Cluster5[sample(nrow(Cluster5), nrow(Cluster5)/(nrow(Majority) - Special_Small_Clusters) * n
nrow(Sample5)
```

```
## [1] 1117
```

```
balanced_dataset.1 <- rbind(cs_train_min[-which(names(cs_train_min) == "X")],Cluster1[-which(names(Clus
head(balanced_dataset.1)
```

```
##        SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 17360                 1                           0.66672086  50
## 90565                 1                           0.94196675  59
## 146254                1                           0.99999990  28
## 102792                1                           1.02589064  30
## 49072                 1                           0.65871090  43
## 142766                1                           0.08758682  37
##        NumberOfTime30.59DaysPastDueNotWorse  DebtRatio MonthlyIncome
## 17360                                     0 0.10303558         18381
## 90565                                     1 0.16531402          8008
## 146254                                   98 0.00000000          1664
## 102792                                    1 0.23480463          2763
## 49072                                     0 0.08972058          3900
## 142766                                    0 0.37049259         16666
##        NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 17360                               10                       0
## 90565                                6                       5
## 146254                               0                      98
## 102792                               9                       0
## 49072                                4                       2
## 142766                              22                       0
##        NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 17360                             1                                    1
## 90565                             0                                    0
## 146254                            0                                   98
## 102792                            0                                    2
## 49072                             0                                    1
## 142766                            3                                    0
##        NumberOfDependents
## 17360                   1
## 90565                   0
## 146254                  0
## 102792                  3
## 49072                   2
## 142766                  0
```

```r
nrow(balanced_dataset.1)
```

```
## [1] 10045
```

```r
balanced_x <- data.matrix(balanced_dataset.1[,-1])
balanced_y <- data.matrix(balanced_dataset.1[,1])
```

```r
Minority <- cs_train_min[,-which(names(cs_train_min) == "X")]
kmeans_model_train_minority <- kmeans(Minority, centers = 5)
kmeans_model_train_minority$centers
```

```
##   SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines      age
## 1                1                            3.0460536 44.18669
## 2                1                            3.9472824 48.66770
## 3                1                            0.3757828 62.00000
## 4                1                            0.5243205 45.52381
## 5                1                            0.5747007 50.53819
##   NumberOfTime30.59DaysPastDueNotWorse   DebtRatio MonthlyIncome
## 1                            2.2734194 45.78957515      3199.691
## 2                            1.3074534  0.44067173      7530.187
## 3                            0.0000000  0.02271191    250000.000
## 4                            0.8571429  0.16647645     55664.190
## 5                            1.0798611  0.50577270     15951.382
##   NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 1                         6.88911               2.0648792
## 2                        10.10745               0.7211180
## 3                        15.00000               0.0000000
## 4                        14.61905               0.5238095
## 5                        13.15625               0.4027778
##   NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 1                    0.6765972                            1.7457795
## 2                    1.4540373                            0.6136646
## 3                    2.0000000                            0.0000000
## 4                    4.6666667                            0.0952381
## 5                    2.6319444                            0.3472222
##   NumberOfDependents
## 1          0.9483615
## 2          1.2012422
## 3          0.0000000
## 4          1.0476190
## 5          1.3368056
```

```r
kmeans_model_train_minority$size
```

```
## [1] 3021 1610    1   21  288
```

```r
testing_data <- data.frame(test.x,test.y)
kmeans_model_test  <- kmeans(testing_data, centers = 5) #testing to see if test data has similar cluste
kmeans_model_test$centers #Clusters are grouped as (1,2), (3,5) and (4) for Response Variables.
```

```
##   RevolvingUtilizationOfUnsecuredLines      age
## 1                            3.3340523 50.35998
## 2                            0.2950418 54.23077
## 3                            0.1501357 60.16667
## 4                            7.2909033 52.99487
## 5                           27.6093312 54.01161
```

```
##   NumberOfTime30.59DaysPastDueNotWorse    DebtRatio MonthlyIncome
## 1                           0.4511763 38.266839034      3910.045
## 2                           0.3974359  0.077906671     96138.115
## 3                           0.3333333  0.002840504   1103530.500
## 4                           0.2605648  0.309173812      9940.086
## 5                           0.2585139  0.234410533     25034.900
##   NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 1                        7.916175              0.29827306
## 2                       10.666667              0.08974359
## 3                       11.666667              0.00000000
## 4                       10.209088              0.06744563
## 5                       11.632353              0.03715170
##   NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 1                    0.8020238                          0.26264883
## 2                    2.3333333                          0.08974359
## 3                    1.3333333                          0.00000000
## 4                    1.4717300                          0.06452451
## 5                    2.0890093                          0.05263158
##   NumberOfDependents     test.y
## 1           0.718358 0.08213362
## 2           1.243590 0.05128205
## 3           0.500000 0.00000000
## 4           1.074132 0.04985394
## 5           1.330495 0.05495356
```

4. Applying Different Methods (with and without Balanced Data)

- Logistic regression (compare the different link functions)
- look maybe merge Lasso with logistic regression
- RF

```
AIC_unbalanced <- 1:4
AIC_balanced <- 1:4
names(AIC_unbalanced)[1] <- "PCA"
names(AIC_unbalanced)[2] <- "Regular GLM"
names(AIC_unbalanced)[3] <- "Ridge"
names(AIC_unbalanced)[4] <- "Lasso"

names(AIC_balanced)[1] <- "PCA"
names(AIC_balanced)[2] <- "Regular GLM"
names(AIC_balanced)[3] <- "Ridge"
names(AIC_balanced)[4] <- "Lasso"
```

Method 1: PCA

1-a) PCA with Unbalanced Data

PCA using all 22 variables

```
pca_including_dummy_variables <- prcomp(na.omit(Jimmys_Bad_Variables[,-c(which(names(Jimmys_Bad_Variabl
```

```
summary(pca_including_dummy_variables) #First PC has like 99.66% of variance
```

```
## Importance of components:
##                              PC1      PC2      PC3   PC4   PC5   PC6   PC7
```

```
## Standard deviation     1.420e+04 426.3224 2.96e+02 14.49 5.925 5.059 1.586
## Proportion of Variance 9.987e-01   0.0009 4.30e-04  0.00 0.000 0.000 0.000
## Cumulative Proportion  9.987e-01   0.9996 1.00e+00  1.00 1.000 1.000 1.000
##                          PC8   PC9  PC10     PC11     PC12     PC13     PC14
## Standard deviation     1.027 0.565 0.346 0.007445 0.005265 0.003723 0.003722
## Proportion of Variance 0.000 0.000 0.000 0.000000 0.000000 0.000000 0.000000
## Cumulative Proportion  1.000 1.000 1.000 1.000000 1.000000 1.000000 1.000000
##                             PC15      PC16      PC17      PC18      PC19
## Standard deviation     3.59e-15 1.287e-17 9.127e-18 3.089e-20 3.354e-23
## Proportion of Variance 0.00e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
## Cumulative Proportion  1.00e+00 1.000e+00 1.000e+00 1.000e+00 1.000e+00
##                              PC20
## Standard deviation     2.404e-37
## Proportion of Variance 0.000e+00
## Cumulative Proportion  1.000e+00
```

```
pca_including_dummy_variables$rotation[,1] #I think it really likes Monthly Income as it's close to 1.
```

```
## RevolvingUtilizationOfUnsecuredLines                                  age
##                          1.663543e-04                         3.754805e-05
## NumberOfTime30.59DaysPastDueNotWorse                             DebtRatio
##                         -2.494353e-06                        -9.026497e-04
##                         MonthlyIncome      NumberOfOpenCreditLinesAndLoans
##                          9.999996e-01                         3.387604e-05
##              NumberOfTimes90DaysLate         NumberRealEstateLoansOrLines
##                         -2.982336e-06                         1.014049e-05
## NumberOfTime60.89DaysPastDueNotWorse                   NumberOfDependents
##                         -2.547678e-06                         5.400872e-06
##                         HighRevolving             Many_LessThan2MonthsLate
##                          0.000000e+00                         3.594719e-10
##                         HighDebtRatio                                 Rich
##                         -2.774522e-11                        -2.774522e-11
##                     Many_CurrentLoans          Many_AtLeastThreeMonthsLate
##                          3.130335e-09                        -2.774522e-11
##                       Many_HouseLoans            Many_TwoToThreeMonthsLate
##                         -3.198419e-10                        -2.774522e-11
##                NA_Dependents_are_Mean                       Many_Dependents
##                          5.400872e-06                        -3.198419e-10
```

```
glm_pca_including_dummy_variables <- glm(train.y ~ pca_including_dummy_variables$x[,1], family = "binomi
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(glm_pca_including_dummy_variables)
```

```
##
## Call:
## glm(formula = train.y ~ pca_including_dummy_variables$x[, 1],
##     family = "binomial")
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -0.4302  -0.3975  -0.3784  -0.3507   5.2302
##
## Coefficients:
##                                          Estimate Std. Error z value Pr(>|z|)
```

```
## (Intercept)                          -2.638e+00  1.522e-02 -173.29   <2e-16 ***
## pca_including_dummy_variables$x[, 1] -4.536e-05  3.798e-06  -11.94   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 36033  on 72160  degrees of freedom
## Residual deviance: 35857  on 72159  degrees of freedom
## AIC: 35861
##
## Number of Fisher Scoring iterations: 6
```

PCA using original 10 variables

```
pca_original_data <- prcomp(train.x)
```

```
summary(pca_original_data) #PC1 has 99.66% variance explained
```

```
## Importance of components:
##                             PC1      PC2      PC3   PC4   PC5   PC6   PC7
## Standard deviation     1.420e+04 426.3224 2.96e+02 14.49 5.925 5.058 1.144
## Proportion of Variance 9.987e-01   0.0009 4.30e-04  0.00 0.000 0.000 0.000
## Cumulative Proportion  9.987e-01   0.9996 1.00e+00  1.00 1.000 1.000 1.000
##                          PC8   PC9  PC10
## Standard deviation     1.007 0.565 0.346
## Proportion of Variance 0.000 0.000 0.000
## Cumulative Proportion  1.000 1.000 1.000
```

```
pca_original_data$rotation[,1] #It also really likes MonthlyIncome and not anything else
```

```
## RevolvingUtilizationOfUnsecuredLines                                  age
##                         1.663543e-04                         3.754805e-05
## NumberOfTime30.59DaysPastDueNotWorse                             DebtRatio
##                        -2.494353e-06                        -9.026497e-04
##                        MonthlyIncome      NumberOfOpenCreditLinesAndLoans
##                         9.999996e-01                         3.387604e-05
##               NumberOfTimes90DaysLate         NumberRealEstateLoansOrLines
##                        -2.982336e-06                         1.014049e-05
## NumberOfTime60.89DaysPastDueNotWorse                    NumberOfDependents
##                        -2.547678e-06                         5.400872e-06
```

```
glm_pca_original_data <- glm(train.y ~ pca_original_data$x[,1], family = "binomial")
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(glm_pca_original_data)
```

```
##
## Call:
## glm(formula = train.y ~ pca_original_data$x[, 1], family = "binomial")
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -0.4302  -0.3975  -0.3784  -0.3507   5.2302
##
```

```
## Coefficients:
##                            Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -2.638e+00  1.522e-02 -173.29   <2e-16 ***
## pca_original_data$x[, 1] -4.536e-05  3.798e-06  -11.94   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 36033  on 72160  degrees of freedom
## Residual deviance: 35857  on 72159  degrees of freedom
## AIC: 35861
##
## Number of Fisher Scoring iterations: 6
```

```
AIC_unbalanced[1] <- glm_pca_original_data$aic
```

PCA Using Dummy variables

```
pca_dummy <- prcomp(Just_Bad_Variables[,-c(which(names(Just_Bad_Variables) == "SeriousDlqin2yrs"), which
```

```
summary(pca_dummy) #PC 1 is 100%?
```

```
## Importance of components:
##                           PC1      PC2      PC3      PC4      PC5       PC6
## Standard deviation     14.46 0.007445 0.005265 0.003723 0.003723 7.281e-16
## Proportion of Variance  1.00 0.000000 0.000000 0.000000 0.000000 0.000e+00
## Cumulative Proportion   1.00 1.000000 1.000000 1.000000 1.000000 1.000e+00
##                              PC7       PC8       PC9      PC10
## Standard deviation     6.661e-16 1.404e-19 8.404e-23 1.584e-35
## Proportion of Variance 0.000e+00 0.000e+00 0.000e+00 0.000e+00
## Cumulative Proportion  1.000e+00 1.000e+00 1.000e+00 1.000e+00
```

```
pca_dummy$rotation[,1] #Age is significant
```

```
##                          age               HighRevolving
##                1.000000e+00                0.000000e+00
##    Many_LessThan2MonthsLate               HighDebtRatio
##                1.108186e-06               -2.834080e-07
##                        Rich           Many_CurrentLoans
##               -2.834080e-07                5.117887e-07
## Many_AtLeastThreeMonthsLate             Many_HouseLoans
##               -2.834080e-07               -1.012338e-06
##   Many_TwoToThreeMonthsLate             Many_Dependents
##               -2.834080e-07               -1.012338e-06
```

```
glm_pca_dummy <- glm(train.y ~ pca_dummy$x[,1], family = "binomial")
summary(glm_pca_dummy)
```

```
##
## Call:
## glm(formula = train.y ~ pca_dummy$x[, 1], family = "binomial")
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -0.7208  -0.4135  -0.3553  -0.3049   2.8707
```

```
##
## Coefficients:
##                   Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -2.681737   0.015742 -170.36   <2e-16 ***
## pca_dummy$x[, 1] -0.028603   0.001092  -26.19   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 36033  on 72160  degrees of freedom
## Residual deviance: 35308  on 72159  degrees of freedom
## AIC: 35312
##
## Number of Fisher Scoring iterations: 5
```

1 b) PCA with Balanced Data

```r
pca_balanced <- prcomp(balanced_dataset.1[,-which(names(balanced_dataset.1) == "SeriousDlqin2yrs")])
summary(pca_balanced) #99.98% Variance is explained by PC1
```

```
## Importance of components:
##                              PC1       PC2       PC3   PC4   PC5   PC6   PC7
## Standard deviation     3.625e+04 520.00821 435.91150 13.82 11.52 5.317 1.248
## Proportion of Variance 9.997e-01   0.00021   0.00014  0.00  0.00 0.000 0.000
## Cumulative Proportion  9.997e-01   0.99986   1.00000  1.00  1.00 1.000 1.000
##                          PC8   PC9  PC10
## Standard deviation     1.159 0.903 0.627
## Proportion of Variance 0.000 0.000 0.000
## Cumulative Proportion  1.000 1.000 1.000
```

```r
pca_balanced$rotation[,1]
```

```
## RevolvingUtilizationOfUnsecuredLines                                  age
##                          1.070390e-04                         1.358236e-05
## NumberOfTime30.59DaysPastDueNotWorse                             DebtRatio
##                         -2.634321e-06                        -1.573957e-04
##                         MonthlyIncome      NumberOfOpenCreditLinesAndLoans
##                          1.000000e+00                         9.098638e-06
##               NumberOfTimes90DaysLate         NumberRealEstateLoansOrLines
##                         -2.675902e-06                         2.790161e-06
## NumberOfTime60.89DaysPastDueNotWorse                    NumberOfDependents
##                         -2.291266e-06                         1.294679e-06
```

```r
glm_pca_balanced <- glm(balanced_dataset.1$SeriousDlqin2yrs ~ pca_balanced$x[,1], family = "binomial")
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```r
summary(glm_pca_balanced)
```

```
##
## Call:
## glm(formula = balanced_dataset.1$SeriousDlqin2yrs ~ pca_balanced$x[,
##     1], family = "binomial")
##
## Deviance Residuals:
```

```
##     Min       1Q   Median       3Q      Max
## -1.2896  -1.1847  -0.3043   1.1506   4.6412
##
## Coefficients:
##                       Estimate Std. Error z value Pr(>|z|)
## (Intercept)         -9.622e-02  2.158e-02  -4.459 8.22e-06 ***
## pca_balanced$x[, 1] -4.412e-05  3.746e-06 -11.779  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 13923  on 10044  degrees of freedom
## Residual deviance: 13655  on 10043  degrees of freedom
## AIC: 13659
##
## Number of Fisher Scoring iterations: 6
```

```
AIC_balanced[1] <- glm_pca_balanced$aic
```

Method 2: Using GLM Original Predictors vs Extreme Binned Predictors + MonthlyIncome

We compared GLM original Predictors with extreme binned predictors using unbalanced data and see better performance in original numeric predictors.

We now try to improve the model using balanced data.

2 a) GLM Original Predictors with Unbalanced Data

```
## Orignial Predictors

model <- glm(Jimmys_Bad_Variables$SeriousDlqin2yrs ~ ., family = "binomial", data = subset(Jimmys_Bad_Va
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
#To Change family link use family = quasi(variance = "mu^3", link = "log") change quasi
summary(model)
```

```
##
## Call:
## glm(formula = Jimmys_Bad_Variables$SeriousDlqin2yrs ~ ., family = "binomial",
##     data = subset(Jimmys_Bad_Variables, select = RevolvingUtilizationOfUnsecuredLines:NumberOfDepende
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.9318  -0.3956  -0.3264  -0.2654   5.2661
##
## Coefficients:
##                                      Estimate Std. Error z value Pr(>|z|)
## (Intercept)                         -1.562e+00  6.016e-02 -25.957  < 2e-16 ***
## RevolvingUtilizationOfUnsecuredLines -8.778e-05  1.123e-04  -0.782    0.434
## age                                 -2.411e-02  1.203e-03 -20.045  < 2e-16 ***
## NumberOfTime30.59DaysPastDueNotWorse  4.991e-01  1.537e-02  32.464  < 2e-16 ***
## DebtRatio                           -7.277e-05  5.259e-05  -1.384    0.166
## MonthlyIncome                       -4.383e-05  4.296e-06 -10.202  < 2e-16 ***
## NumberOfOpenCreditLinesAndLoans     -1.905e-03  3.508e-03  -0.543    0.587
```

```
## NumberOfTimes90DaysLate               4.205e-01  2.195e-02  19.154  < 2e-16 ***
## NumberRealEstateLoansOrLines          8.801e-02  1.403e-02   6.272 3.57e-10 ***
## NumberOfTime60.89DaysPastDueNotWorse -8.845e-01  2.524e-02 -35.043  < 2e-16 ***
## NumberOfDependents                    1.061e-01  1.250e-02   8.493  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 36033  on 72160  degrees of freedom
## Residual deviance: 33374  on 72150  degrees of freedom
## AIC: 33396
##
## Number of Fisher Scoring iterations: 6
```

```
plot(model, which = 1) #Outliers skew residuals plot
```

```
## Recode the model Orignial Predictors
model <- glm(cs_train$SeriousDlqin2yrs ~ ., family = "binomial", data = train.x)
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
AIC_unbalanced[2] <- model$aic
```

```
# Run AIC on the model
model_AIC <- stepAIC(model)
```

```
## Start:  AIC=33396.05
```

```
## cs_train$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecuredLines +
##     age + NumberOfTime30.59DaysPastDueNotWorse + DebtRatio +
##     MonthlyIncome + NumberOfOpenCreditLinesAndLoans + NumberOfTimes90DaysLate +
##     NumberRealEstateLoansOrLines + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

##                                        Df Deviance   AIC
## - NumberOfOpenCreditLinesAndLoans       1    33374 33394
## - RevolvingUtilizationOfUnsecuredLines  1    33375 33395
## <none>                                       33374 33396
## - DebtRatio                             1    33376 33396
## - NumberRealEstateLoansOrLines          1    33412 33432
## - NumberOfDependents                    1    33444 33464
## - MonthlyIncome                         1    33504 33524
## - NumberOfTimes90DaysLate               1    33738 33758
## - age                                   1    33796 33816
## - NumberOfTime30.59DaysPastDueNotWorse  1    34316 34336
## - NumberOfTime60.89DaysPastDueNotWorse  1    34539 34559

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

##
## Step:  AIC=33394.35
## cs_train$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecuredLines +
##     age + NumberOfTime30.59DaysPastDueNotWorse + DebtRatio +
##     MonthlyIncome + NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
##     NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
##                                        Df Deviance   AIC
## - RevolvingUtilizationOfUnsecuredLines  1    33375 33393
## <none>                                       33374 33394
## - DebtRatio                             1    33377 33395
## - NumberRealEstateLoansOrLines          1    33415 33433
## - NumberOfDependents                    1    33444 33462
## - MonthlyIncome                         1    33508 33526
## - NumberOfTimes90DaysLate               1    33744 33762
## - age                                   1    33816 33834
## - NumberOfTime30.59DaysPastDueNotWorse  1    34323 34341
## - NumberOfTime60.89DaysPastDueNotWorse  1    34540 34558
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
##
## Step:  AIC=33393.21
## cs_train$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse +
##     DebtRatio + MonthlyIncome + NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
##     NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
##                                        Df Deviance   AIC
## <none>                                       33375 33393
## - DebtRatio                             1    33378 33394
## - NumberRealEstateLoansOrLines          1    33416 33432
## - NumberOfDependents                    1    33445 33461
## - MonthlyIncome                         1    33509 33525
## - NumberOfTimes90DaysLate               1    33745 33761
## - age                                   1    33816 33832
## - NumberOfTime30.59DaysPastDueNotWorse  1    34324 34340
## - NumberOfTime60.89DaysPastDueNotWorse  1    34541 34557
```

```
model_AIC
```

```
##
## Call:  glm(formula = cs_train$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse +
##     DebtRatio + MonthlyIncome + NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
##     NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents,
```

```
##     family = "binomial", data = train.x)
##
## Coefficients:
##                          (Intercept)                                   age
##                           -1.567e+00                            -2.422e-02
## NumberOfTime30.59DaysPastDueNotWorse                           DebtRatio
##                            4.981e-01                            -7.371e-05
##                        MonthlyIncome               NumberOfTimes90DaysLate
##                           -4.418e-05                             4.219e-01
##         NumberRealEstateLoansOrLines  NumberOfTime60.89DaysPastDueNotWorse
##                            8.517e-02                            -8.849e-01
##                   NumberOfDependents
##                            1.061e-01
##
## Degrees of Freedom: 72160 Total (i.e. Null);  72152 Residual
## Null Deviance:       36030
## Residual Deviance: 33380     AIC: 33390
```

2 b) GLM Extreme Binned Predictors with Unbalanced Data

```
model2 <- glm(Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome + Jimmys_Bad_Variables[,13] + Jimmys
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
model2
```

```
##
## Call:  glm(formula = Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome +
##     Jimmys_Bad_Variables[, 13] + Jimmys_Bad_Variables[, 14] +
##     Jimmys_Bad_Variables[, 15] + Jimmys_Bad_Variables[, 16] +
##     Jimmys_Bad_Variables[, 17] + Jimmys_Bad_Variables[, 18] +
##     Jimmys_Bad_Variables[, 19] + Jimmys_Bad_Variables[, 20] +
##     Jimmys_Bad_Variables[, 22], family = "binomial", data = Jimmys_Bad_Variables)
##
## Coefficients:
##                (Intercept)               MonthlyIncome
##                 -2.336e+00                  -4.536e-05
## Jimmys_Bad_Variables[, 13]  Jimmys_Bad_Variables[, 14]
##                         NA                  -7.691e+00
## Jimmys_Bad_Variables[, 15]  Jimmys_Bad_Variables[, 16]
##                 -7.946e+00                          NA
## Jimmys_Bad_Variables[, 17]  Jimmys_Bad_Variables[, 18]
##                 -5.862e+00                          NA
## Jimmys_Bad_Variables[, 19]  Jimmys_Bad_Variables[, 20]
##                 -8.139e+00                          NA
## Jimmys_Bad_Variables[, 22]
##                         NA
##
## Degrees of Freedom: 72160 Total (i.e. Null);  72155 Residual
## Null Deviance:       36030
## Residual Deviance: 35860     AIC: 35870
```

```
model2$rank # equals 7 which is how many variables are not NA
```

```
## [1] 6
```

```r
#Certain Dummy Variables are a  Singular Matrix Meaning that some of our variables can be constructed u
#Not Sure what to do, but I'll remove these variables in the meantime
```

2 c) GLM Original Predictors Using Balanced Data

```r
model_balanced <- glm(balanced_dataset.1$SeriousDlqin2yrs ~ ., data = balanced_dataset.1)
summary(model_balanced)
```

```
##
## Call:
## glm(formula = balanced_dataset.1$SeriousDlqin2yrs ~ ., data = balanced_dataset.1)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.2672  -0.4510  -0.2253   0.4675   1.9283
##
## Coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          7.414e-01  1.935e-02  38.322  < 2e-16 ***
## RevolvingUtilizationOfUnsecuredLines -6.955e-06  9.127e-06  -0.762    0.446
## age                                  -6.129e-03  3.626e-04 -16.902  < 2e-16 ***
## NumberOfTime30.59DaysPastDueNotWorse  8.424e-02  4.481e-03  18.800  < 2e-16 ***
## DebtRatio                            6.081e-06  1.090e-05   0.558    0.577
## MonthlyIncome                        -7.979e-07  1.315e-07  -6.068 1.34e-09 ***
## NumberOfOpenCreditLinesAndLoans      -1.151e-03  1.010e-03  -1.140    0.254
## NumberOfTimes90DaysLate              4.436e-02  5.254e-03   8.443  < 2e-16 ***
## NumberRealEstateLoansOrLines         6.004e-03  3.859e-03   1.556    0.120
## NumberOfTime60.89DaysPastDueNotWorse -1.217e-01  6.108e-03 -19.917  < 2e-16 ***
## NumberOfDependents                   1.844e-02  4.020e-03   4.588 4.53e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.2261911)
##
##     Null deviance: 2510.6  on 10044  degrees of freedom
## Residual deviance: 2269.6  on 10034  degrees of freedom
## AIC: 13589
##
## Number of Fisher Scoring iterations: 2
```

```r
AIC_balanced[2] <- model_balanced$aic
```

```r
stepAIC(model_balanced) #remove Debt Ratio and NumberOfOpenCreditLinesAndLoans
```

```
## Start:  AIC=13588.83
## balanced_dataset.1$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecuredLines +
##     age + NumberOfTime30.59DaysPastDueNotWorse + DebtRatio +
##     MonthlyIncome + NumberOfOpenCreditLinesAndLoans + NumberOfTimes90DaysLate +
##     NumberRealEstateLoansOrLines + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents
##
##                                        Df Deviance   AIC
## - DebtRatio                             1   2269.7 13587
## - RevolvingUtilizationOfUnsecuredLines  1   2269.7 13587
```

```
## - NumberOfOpenCreditLinesAndLoans       1   2269.9 13588
## <none>                                      2269.6 13589
## - NumberRealEstateLoansOrLines          1   2270.2 13589
## - NumberOfDependents                    1   2274.4 13608
## - MonthlyIncome                         1   2277.9 13624
## - NumberOfTimes90DaysLate               1   2285.7 13658
## - age                                   1   2334.2 13869
## - NumberOfTime30.59DaysPastDueNotWorse  1   2349.6 13935
## - NumberOfTime60.89DaysPastDueNotWorse  1   2359.3 13976
##
## Step:  AIC=13587.14
## balanced_dataset.1$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecuredLines +
##     age + NumberOfTime30.59DaysPastDueNotWorse + MonthlyIncome +
##     NumberOfOpenCreditLinesAndLoans + NumberOfTimes90DaysLate +
##     NumberRealEstateLoansOrLines + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents
##
##                                         Df Deviance   AIC
## - RevolvingUtilizationOfUnsecuredLines  1   2269.8 13586
## - NumberOfOpenCreditLinesAndLoans       1   2270.0 13586
## <none>                                      2269.7 13587
## - NumberRealEstateLoansOrLines          1   2270.2 13588
## - NumberOfDependents                    1   2274.4 13606
## - MonthlyIncome                         1   2278.0 13622
## - NumberOfTimes90DaysLate               1   2285.8 13656
## - age                                   1   2334.2 13867
## - NumberOfTime30.59DaysPastDueNotWorse  1   2349.6 13933
## - NumberOfTime60.89DaysPastDueNotWorse  1   2359.4 13975
##
## Step:  AIC=13585.72
## balanced_dataset.1$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse +
##     MonthlyIncome + NumberOfOpenCreditLinesAndLoans + NumberOfTimes90DaysLate +
##     NumberRealEstateLoansOrLines + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents
##
##                                         Df Deviance   AIC
## - NumberOfOpenCreditLinesAndLoans       1   2270.1 13585
## <none>                                      2269.8 13586
## - NumberRealEstateLoansOrLines          1   2270.4 13586
## - NumberOfDependents                    1   2274.6 13605
## - MonthlyIncome                         1   2278.2 13621
## - NumberOfTimes90DaysLate               1   2285.9 13655
## - age                                   1   2334.4 13865
## - NumberOfTime30.59DaysPastDueNotWorse  1   2349.8 13932
## - NumberOfTime60.89DaysPastDueNotWorse  1   2359.6 13974
##
## Step:  AIC=13585.02
## balanced_dataset.1$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse +
##     MonthlyIncome + NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
##     NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents
##
##                                         Df Deviance   AIC
## - NumberRealEstateLoansOrLines          1   2270.4 13584
## <none>                                      2270.1 13585
```

```
## - NumberOfDependents                    1   2274.9 13604
## - MonthlyIncome                         1   2278.6 13620
## - NumberOfTimes90DaysLate               1   2287.1 13658
## - age                                   1   2338.7 13882
## - NumberOfTime30.59DaysPastDueNotWorse  1   2350.0 13930
## - NumberOfTime60.89DaysPastDueNotWorse  1   2360.1 13974
##
## Step:  AIC=13584.44
## balanced_dataset.1$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse +
##     MonthlyIncome + NumberOfTimes90DaysLate + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents
##
##                                         Df Deviance   AIC
## <none>                                       2270.4 13584
## - NumberOfDependents                    1   2275.4 13604
## - MonthlyIncome                         1   2278.7 13619
## - NumberOfTimes90DaysLate               1   2287.1 13656
## - age                                   1   2338.9 13881
## - NumberOfTime30.59DaysPastDueNotWorse  1   2351.7 13936
## - NumberOfTime60.89DaysPastDueNotWorse  1   2360.3 13972
```

```
##
## Call:  glm(formula = balanced_dataset.1$SeriousDlqin2yrs ~ age + NumberOfTime30.59DaysPastDueNotWorse
##     MonthlyIncome + NumberOfTimes90DaysLate + NumberOfTime60.89DaysPastDueNotWorse +
##     NumberOfDependents, data = balanced_dataset.1)
##
## Coefficients:
##                          (Intercept)                                   age
##                            7.387e-01                            -6.150e-03
## NumberOfTime30.59DaysPastDueNotWorse                         MonthlyIncome
##                            8.414e-02                            -7.935e-07
##              NumberOfTimes90DaysLate  NumberOfTime60.89DaysPastDueNotWorse
##                            4.456e-02                            -1.217e-01
##                   NumberOfDependents
##                            1.883e-02
##
## Degrees of Freedom: 10044 Total (i.e. Null);  10038 Residual
## Null Deviance:       2511
## Residual Deviance: 2270  AIC: 13580
```

```
model_balanced_final <- glm(formula = balanced_dataset.1$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecu
    age + NumberOfTime30.59DaysPastDueNotWorse + MonthlyIncome +
    NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
    NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents,
    data = balanced_dataset.1)
summary(model_balanced_final)
```

```
##
## Call:
## glm(formula = balanced_dataset.1$SeriousDlqin2yrs ~ RevolvingUtilizationOfUnsecuredLines +
##     age + NumberOfTime30.59DaysPastDueNotWorse + MonthlyIncome +
##     NumberOfTimes90DaysLate + NumberRealEstateLoansOrLines +
##     NumberOfTime60.89DaysPastDueNotWorse + NumberOfDependents,
##     data = balanced_dataset.1)
##
```

```
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.2685  -0.4509  -0.2253   0.4661   1.9416
##
## Coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          7.374e-01  1.904e-02  38.737  < 2e-16 ***
## RevolvingUtilizationOfUnsecuredLines -6.892e-06  9.126e-06  -0.755    0.450
## age                                  -6.203e-03  3.561e-04 -17.417  < 2e-16 ***
## NumberOfTime30.59DaysPastDueNotWorse  8.367e-02  4.453e-03  18.789  < 2e-16 ***
## MonthlyIncome                        -8.029e-07  1.314e-07  -6.109 1.04e-09 ***
## NumberOfTimes90DaysLate               4.517e-02  5.210e-03   8.669  < 2e-16 ***
## NumberRealEstateLoansOrLines          4.168e-03  3.483e-03   1.197    0.231
## NumberOfTime60.89DaysPastDueNotWorse -1.218e-01  6.107e-03 -19.947  < 2e-16 ***
## NumberOfDependents                    1.842e-02  4.019e-03   4.582 4.66e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.2261825)
##
##     Null deviance: 2510.6  on 10044  degrees of freedom
## Residual deviance: 2270.0  on 10036  degrees of freedom
## AIC: 13586
##
## Number of Fisher Scoring iterations: 2
```

```
model3 <- glm(Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome + Jimmys_Bad_Variables[,15] + Jimmys
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
model3
```

```
##
## Call:  glm(formula = Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome +
##     Jimmys_Bad_Variables[, 15] + Jimmys_Bad_Variables[, 16] +
##     Jimmys_Bad_Variables[, 17] + Jimmys_Bad_Variables[, 18] +
##     Jimmys_Bad_Variables[, 19], family = "binomial", data = Jimmys_Bad_Variables)
##
## Coefficients:
##                (Intercept)               MonthlyIncome
##                 -2.336e+00                  -4.536e-05
## Jimmys_Bad_Variables[, 15]  Jimmys_Bad_Variables[, 16]
##                 -7.946e+00                          NA
## Jimmys_Bad_Variables[, 17]  Jimmys_Bad_Variables[, 18]
##                 -5.862e+00                          NA
## Jimmys_Bad_Variables[, 19]
##                 -8.139e+00
##
## Degrees of Freedom: 72160 Total (i.e. Null);  72156 Residual
## Null Deviance:       36030
## Residual Deviance: 35860     AIC: 35870
```

```
model4 <- glm(Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome + Jimmys_Bad_Variables[,15] + Jimmys
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```r
model4
```

```
##
## Call:  glm(formula = Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome +
##     Jimmys_Bad_Variables[, 15] + Jimmys_Bad_Variables[, 16] +
##     Jimmys_Bad_Variables[, 17] + Jimmys_Bad_Variables[, 18] +
##     Jimmys_Bad_Variables[, 19], family = binomial(link = "probit"),
##     data = Jimmys_Bad_Variables)
##
## Coefficients:
##                (Intercept)               MonthlyIncome
##                 -1.385e+00                  -1.658e-05
## Jimmys_Bad_Variables[, 15]  Jimmys_Bad_Variables[, 16]
##                 -2.677e+00                          NA
## Jimmys_Bad_Variables[, 17]  Jimmys_Bad_Variables[, 18]
##                 -1.915e+00                          NA
## Jimmys_Bad_Variables[, 19]
##                 -2.748e+00
##
## Degrees of Freedom: 72160 Total (i.e. Null);  72156 Residual
## Null Deviance:       36030
## Residual Deviance: 35890     AIC: 35900
```

```r
model5 <- glm(Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome + Jimmys_Bad_Variables[,15] + Jimmys
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```r
model5
```

```
##
## Call:  glm(formula = Jimmys_Bad_Variables$SeriousDlqin2yrs ~ MonthlyIncome +
##     Jimmys_Bad_Variables[, 15] + Jimmys_Bad_Variables[, 16] +
##     Jimmys_Bad_Variables[, 17] + Jimmys_Bad_Variables[, 18] +
##     Jimmys_Bad_Variables[, 19], family = binomial(link = "cloglog"),
##     data = Jimmys_Bad_Variables)
##
## Coefficients:
##                (Intercept)               MonthlyIncome
##                 -2.3775977                  -0.0000445
## Jimmys_Bad_Variables[, 15]  Jimmys_Bad_Variables[, 16]
##                 -7.8205053                          NA
## Jimmys_Bad_Variables[, 17]  Jimmys_Bad_Variables[, 18]
##                 -5.7758409                          NA
## Jimmys_Bad_Variables[, 19]
##                 -8.0096201
##
## Degrees of Freedom: 72160 Total (i.e. Null);  72156 Residual
## Null Deviance:       36030
## Residual Deviance: 35850     AIC: 35860
```

```r
anova(model,model2,model3,model4,model5) #model 2 is the one with NA values
```

```
## Warning in anova.glmlist(c(list(object), dotargs), dispersion = dispersion, :
## c("models with response 'c(\"Jimmys_Bad_Variables$SeriousDlqin2yrs\",
## \"Jimmys_Bad_Variables$SeriousDlqin2yrs\", ' removed because response differs
## from model 1", "models with response '\"Jimmys_Bad_Variables$SeriousDlqin2yrs\",
```

```
## \"Jimmys_Bad_Variables$SeriousDlqin2yrs\"' removed because response differs from
## model 1", "models with response ')' removed because response differs from model
## 1")

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred

## Analysis of Deviance Table
##
## Model: binomial, link: logit
##
## Response: cs_train$SeriousDlqin2yrs
##
## Terms added sequentially (first to last)
##
##
##                                      Df Deviance Resid. Df Resid. Dev
## NULL                                                 72160      36033
## RevolvingUtilizationOfUnsecuredLines  1     0.98     72159      36032
## age                                   1   725.52     72158      35306
## NumberOfTime30.59DaysPastDueNotWorse  1   338.11     72157      34968
## DebtRatio                             1     0.06     72156      34968
## MonthlyIncome                         1    75.45     72155      34892
## NumberOfOpenCreditLinesAndLoans       1    14.61     72154      34878
## NumberOfTimes90DaysLate               1   205.44     72153      34672
## NumberRealEstateLoansOrLines          1    39.50     72152      34633
## NumberOfTime60.89DaysPastDueNotWorse  1  1189.20     72151      33444
## NumberOfDependents                    1    69.70     72150      33374
```

```r
#model 1 is the best but we can check model 5 using our dummy variables
```

Method 3: Ridge

3 a) Ridge with Unbalanced Data

```r
x <- data.frame(training_dataset)
x <- na.omit(x) #Remember Monthly Income contains NA values
x_for_ridge <- data.matrix(x[,-1]) #Everything but Response Variable
ridge_model5 <- cv.glmnet(x_for_ridge,x[,1], alpha = 0, standardize = TRUE, nfolds = length(x))
ridge_model5
```

```
##
## Call:  cv.glmnet(x = x_for_ridge, y = x[, 1], nfolds = length(x), alpha = 0,      standardize = TRUE
##
## Measure: Mean-Squared Error
##
##     Lambda Index Measure    SE Nonzero
## min  275.9    25   87606 35789      10
## 1se 2573.2     1   87615 35791      10
```

```
Log.Likelihood <- ridge_model5$glmnet.fit$nulldev - ridge_model5$glmnet.fit$nulldev * (1- ridge_model5$g
k <- ridge_model5$glmnet.fit$df[which(ridge_model5$glmnet.fit$lambda == ridge_model5$lambda.min)]
n <- ridge_model5$glmnet.fit$nobs
AICc <- -Log.Likelihood + 2 * k + 2 * k * (k+1)/(n-k-1)
AIC_unbalanced[3] <- AICc
```

3 b) Ridge with Balanced Data

```
x_for_ridge_balanced <- data.matrix(balanced_dataset.1[,-1])
ridge_model_balanced <- cv.glmnet(x_for_ridge_balanced,balanced_dataset.1[,1], alpha = 0, standardize =
ridge_model_balanced
```

```
##
## Call:  cv.glmnet(x = x_for_ridge_balanced, y = balanced_dataset.1[,      1], nfolds = length(balance
##
## Measure: Mean-Squared Error
##
##      Lambda Index Measure       SE Nonzero
## min 0.00953   100  0.2339 0.003373      10
## 1se 0.03193    87  0.2371 0.003105      10
```

```
Log.Likelihood <- ridge_model_balanced$glmnet.fit$nulldev - ridge_model_balanced$glmnet.fit$nulldev * (
k <- ridge_model_balanced$glmnet.fit$df[which(ridge_model_balanced$glmnet.fit$lambda == ridge_model_bala
n <- ridge_model_balanced$glmnet.fit$nobs
AICc <- -Log.Likelihood + 2 * k + 2 * k * (k+1)/(n-k-1)
AIC_balanced[3] <- AICc
```

Method 4: Lasso

4 a) Lasso with Unbalanced Data

```
lasso_model5 <- cv.glmnet(x_for_ridge,x[,1], alpha = 1, standardize = TRUE, nfolds = length(x))
lasso_model5
```

```
##
## Call:  cv.glmnet(x = x_for_ridge, y = x[, 1], nfolds = length(x), alpha = 1,      standardize = TRUE
##
## Measure: Mean-Squared Error
##
##     Lambda Index Measure    SE Nonzero
## min 0.3323    23   87592 33077       6
## 1se 2.5732     1   87615 33082       0
```

```
Log.Likelihood <- lasso_model5$glmnet.fit$nulldev - lasso_model5$glmnet.fit$nulldev * (1- lasso_model5$g
k <- lasso_model5$glmnet.fit$df[which(lasso_model5$glmnet.fit$lambda == lasso_model5$lambda.min)]
n <- lasso_model5$glmnet.fit$nobs
AICc <- -Log.Likelihood + 2 * k + 2 * k * (k+1)/(n-k-1)
AICc
```

```
## [1] -2142095
```

```
AIC_unbalanced[4] <- AICc
```

4 b) Lasso with Balanced Data

```
lasso_model_balanced <- cv.glmnet(x_for_ridge_balanced,balanced_dataset.1[,1], alpha = 1, standardize =
lasso_model_balanced
```

```
##
## Call:  cv.glmnet(x = x_for_ridge_balanced, y = balanced_dataset.1[,      1], nfolds = length(balance
##
## Measure: Mean-Squared Error
##
##       Lambda Index Measure       SE Nonzero
## min 0.000170    69  0.2294 0.003206      10
## 1se 0.003345    37  0.2324 0.002600       8
```

```
Log.Likelihood <- lasso_model_balanced$glmnet.fit$nulldev - lasso_model_balanced$glmnet.fit$nulldev * (
k <- lasso_model_balanced$glmnet.fit$df[which(lasso_model_balanced$glmnet.fit$lambda == lasso_model_bala
n <- lasso_model_balanced$glmnet.fit$nobs
AICc <- -2 * Log.Likelihood + 2 * k + 2 * k * (k+1)/(n-k-1)
AICc
```

```
## [1] -461.6335
```

```
AIC_balanced[4] <- AICc
```

Method 4: Random Forest

4 a) Random Forest with Unbalanced Data

```
# Fits Random Forest
model.rf = randomForest(y = as.factor(train.y), x=train.x, xtest=test.x, ytest=as.factor(test.y), mtry =

model.rf # Output shows confusion matrix for both train and test
```

```
##
## Call:
##  randomForest(x = train.x, y = as.factor(train.y), xtest = test.x,      ytest = as.factor(test.y), m
##                Type of random forest: classification
##                      Number of trees: 500
## No. of variables tried at each split: 3
##
##         OOB estimate of  error rate: 6.61%
## Confusion matrix:
##       0   1 class.error
## 0 66601 619 0.009208569
## 1  4150 791 0.839910949
##                 Test set error rate: 6.7%
## Confusion matrix:
##       0   1 class.error
## 0 44304 388 0.008681643
## 1  2837 579 0.830503513
```

```
# Random Forest Output
var.imp = data.frame(importance(model.rf, type=2))
var.imp$Variables = row.names(var.imp)
varimp = var.imp[order(var.imp$MeanDecreaseGini,decreasing = T),]
par(mar = c(7.5,3,2,2))
```

```
giniplot = barplot(t(varimp[-2]/sum(varimp[-2])),las=2,cex.names=1, main="Gini Impurity Index Plot")
```

4 b) Random Forest with Balanced Data

```
model_balanced.rf <- randomForest(y = as.factor(balanced_dataset.1$SeriousDlqin2yrs), x=balanced_x, xtes
, na.action = na.omit)

model_balanced.rf # Output shows confusion matrix for both train and test
```

```
##
## Call:
##  randomForest(x = balanced_x, y = as.factor(balanced_dataset.1$SeriousDlqin2yrs),      xtest = test.
##                Type of random forest: classification
##                      Number of trees: 500
## No. of variables tried at each split: 3
##
##         OOB estimate of  error rate: 22.95%
## Confusion matrix:
##      0    1 class.error
## 0 4062 1042   0.2041536
## 1 1263 3678   0.2556163
##                 Test set error rate: 21.46%
## Confusion matrix:
##       0    1 class.error
## 0 35223 9469   0.2118724
```

```
## 1   854 2562   0.2500000
```

```r
# Random Forest Output
var_balanced.imp = data.frame(importance(model_balanced.rf, type=2))
var_balanced.imp$Variables = row.names(var_balanced.imp)
var_balancedimp = var_balanced.imp[order(var_balanced.imp$MeanDecreaseGini,decreasing = T),]
par(mar = c(7.5,3,2,2))
giniplot = barplot(t(var_balancedimp[-2]/sum(var_balancedimp[-2])),las=2,cex.names=1, main="Gini Impuri
```

```r
Tree <- (getTree(model_balanced.rf, k = 1, labelVar =  TRUE))
head(Tree)
```

```
##   left daughter right daughter                          split var split point
## 1             2              3 RevolvingUtilizationOfUnsecuredLines   0.4778472
## 2             4              5              NumberOfTimes90DaysLate   0.5000000
## 3             6              7 RevolvingUtilizationOfUnsecuredLines   0.9028845
## 4             8              9                            DebtRatio   0.3846390
## 5            10             11      NumberOfOpenCreditLinesAndLoans  23.5000000
## 6            12             13 NumberOfTime30.59DaysPastDueNotWorse   0.5000000
##   status prediction
## 1      1       <NA>
## 2      1       <NA>
## 3      1       <NA>
## 4      1       <NA>
## 5      1       <NA>
## 6      1       <NA>
```

5. Evaluating Model/Comparing results

- mmp plots to see if model fits the data, as well as the pearson Chi-square test
- checking for outliers and influential points
- Some measure of pesudo R-square and accuracy of the model
- Use confusion matrix, ROC/AUC curve, AIC to evaluate the different models

5-1 Evaluation on Final Model using Training Data

```
## Set model as final model
model.final <- model

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newdata=train.x, type="response")
head(train_preds[is.na(train_preds)])
```

```
## named numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]

pred_compare = prediction(train_preds, train.y)
plot(performance(pred_compare, "acc"))
```

```
table(train.y, train_preds>0.2) # accurary on train
```

```
##
```

```
## train.y FALSE  TRUE
##       0 66148  1072
##       1  4161   780
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```r
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final)

cs_train_m <- mutate(cs_train, predprob=predict(model.final, type="response"))  # cal p^_i
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
##   `ntile(linpred, 1000)`     y    ppred count
##                    <int> <int>    <dbl> <int>
## 1                      1     8 0.000387    73
## 2                      2    13 0.00251     73
## 3                      3    22 0.00485     73
## 4                      4    14 0.00717     73
## 5                      5    12 0.00920     73
## 6                      6    15 0.0105      73
```

```r
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```r
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))

ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
c(hlstat, nrow(hldf))
```

```
## [1] 7509.678 1000.000
```

```
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

```
## [1] 0
```

AUC

5-3 Model Performance with Test Data

```
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newdata=test.x, type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```
table(test.y, result_m2>0.2)
```

```
##
## test.y FALSE  TRUE
##      0 44063   629
##      1  2853   563
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.6931242
```

GLM Model with Balanced Dataset

```
## Set model as final model
model.final <- model_balanced

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newdata=train.x, type="response")
head(train_preds[is.na(train_preds)])
```

```
## named numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]

pred_compare = prediction(train_preds, train.y)
plot(performance(pred_compare, "acc"))
```

```
table(train.y, train_preds>0.66) # accurary on train
```

```
##
## train.y FALSE  TRUE
##       0 65474  1746
##       1  3990   951
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final)

cs_train_m <- mutate(balanced_dataset.1, predprob=predict(model.final, type="response"))  # cal p^_i
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
##   `ntile(linpred, 1000)`     y   ppred count
##                    <int> <int>   <dbl> <int>
## 1                      1     5 -0.356     11
## 2                      2     9 -0.0201    11
## 3                      3     9  0.0429    11
## 4                      4     9  0.0854    11
```

```
## 5                        5     9  0.115     11
## 6                        6     6  0.138     11
```

```
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))
```

```
## Warning in sqrt(ppred * (1 - ppred)/count): NaNs produced
```

```
ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
## Warning: Removed 11 rows containing missing values (geom_segment).
```

```
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
c(hlstat, nrow(hldf))
```

```
## [1] 1074.56 1000.00
```

```r
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

```
## [1] 0.04584838
```

AUC

5-3 Model Performance with Test Data

```r
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newdata=test.x, type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```r
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```r
table(test.y, result_m2>0.2)
```

```
##
## test.y FALSE  TRUE
##      0   398 44294
##      1    58  3358
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.6890155
```

###Ridge Model Unbiased Dataset

```
## Set model as final model
model.final <- ridge_model5

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newx=as.matrix(train.x), type="response")
head(train_preds[is.na(train_preds)])
```

```
## numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]

pred_compare = prediction(train_preds, train.y)
```

```r
plot(performance(pred_compare, "acc"))
```

```r
table(train.y, train_preds>0.2) # accurary on train
```

```
##
## train.y  TRUE
##       0 67220
##       1  4941
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```r
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final, newx = as.matrix(train.x), type = "response")

cs_train_m <- mutate(cs_train, predprob=predict(model.final, newx = as.matrix(train.x), type="response")
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
##   `ntile(linpred, 1000)`     y ppred count
##                    <int> <int> <dbl> <int>
## 1                      1     6  6.33    73
## 2                      2     6  6.33    73
```

```
## 3                      3     4  6.33    73
## 4                      4     3  6.33    73
## 5                      5     8  6.33    73
## 6                      6     3  6.33    73
```

```
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))
```

```
## Warning in sqrt(ppred * (1 - ppred)/count): NaNs produced
```

```
ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
## Warning: Removed 1000 rows containing missing values (geom_segment).
```

```
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
c(hlstat, nrow(hldf))
```

```
## [1] -83847.4   1000.0
```

```r
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

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

AUC

5-3 Model Performance with Test Data

```r
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newx= as.matrix(test.x), type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```r
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```r
table(test.y, result_m2>0.2)
```

```
##
## test.y  TRUE
##      0 44692
```

```
##      1  3416
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.5
```

Ridge Model with Balanced Dataset

```
## Set model as final model
model.final <- ridge_model_balanced

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newx=as.matrix(train.x), type="response")
head(train_preds[is.na(train_preds)])
```

```
## numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]
```

```
pred_compare = prediction(train_preds, train.y)
plot(performance(pred_compare, "acc"))
```

```
table(train.y, train_preds>0.66) # accurary on train
```

```
##
## train.y FALSE  TRUE
##       0 67048   172
##       1  4835   106
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final, newx = as.matrix(train.x), type = "response")

cs_train_m <- mutate(cs_train, predprob=predict(model.final, newx = as.matrix(train.x), type="response")
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
##   `ntile(linpred, 1000)`     y ppred count
##                    <int> <int> <dbl> <int>
```

```
## 1                        1     3 0.136    73
## 2                        2     1 0.203    73
## 3                        3     1 0.212    73
## 4                        4     1 0.218    73
## 5                        5     0 0.223    73
## 6                        6     3 0.227    73
```

```
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))
```

```
## Warning in sqrt(ppred * (1 - ppred)/count): NaNs produced
```

```
ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
## Warning: Removed 1 rows containing missing values (geom_segment).
```

```
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
```

```
c(hlstat, nrow(hldf))
```

```
## [1] 48963.4  1000.0
```

```
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

```
## [1] 0
```

AUC

5-3 Model Performance with Test Data

```
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newx= as.matrix(test.x), type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```
table(test.y, result_m2>0.2)
```

```
##
```

```
## test.y FALSE  TRUE
##      0    47 44645
##      1     2  3414
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.6593516
```

###Lasso Model Unbiased Dataset

```
## Set model as final model
model.final <- lasso_model5

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newx=as.matrix(train.x), type="response")
head(train_preds[is.na(train_preds)])
```

```
## numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]

pred_compare = prediction(train_preds, train.y)
plot(performance(pred_compare, "acc"))
```

```
table(train.y, train_preds>0.2) # accurary on train
```

```
##
## train.y  TRUE
##       0 67220
##       1  4941
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final, newx = as.matrix(train.x), type = "response")

cs_train_m <- mutate(cs_train, predprob=predict(model.final, newx = as.matrix(train.x), type="response")
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
```

```
##   `ntile(linpred, 1000)`     y ppred count
##                    <int> <int> <dbl> <int>
## 1                      1     6  6.33    73
## 2                      2     6  6.33    73
## 3                      3     4  6.33    73
## 4                      4     3  6.33    73
## 5                      5     8  6.33    73
## 6                      6     3  6.33    73
```

```
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))
```

```
## Warning in sqrt(ppred * (1 - ppred)/count): NaNs produced
```

```
ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
## Warning: Removed 1000 rows containing missing values (geom_segment).
```

```r
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
c(hlstat, nrow(hldf))
```

```
## [1] -83847.4   1000.0
```

```r
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

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

AUC

5-3 Model Performance with Test Data

```r
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newx= as.matrix(test.x), type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```r
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```
table(test.y, result_m2>0.2)
```

```
##
## test.y  TRUE
##      0 44692
##      1  3416
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.5
```

###Lasso Model Balanced Dataset

```
## Set model as final model
model.final <- lasso_model_balanced

## Evaluation on Final model using Training Data
train_preds = predict(model.final, newx=as.matrix(train.x), type="response")
head(train_preds[is.na(train_preds)])
```

```
## numeric(0)
```

```
#train.x[c(7,9),]
#train_preds[is.na(train_preds)]

pred_compare = prediction(train_preds, train.y)
plot(performance(pred_compare, "acc"))
```

```
table(train.y, train_preds>0.6) # accurary on train
```

```
##
## train.y FALSE  TRUE
##       0 62873  4347
##       1  3808  1133
```

5-3 Goodness of Fit using Hosmer-Lemeshow Test

a)

The p-value is 0, meaning that we want to reject the null hypothesis that the model is adequate.

```
# Goodness of Fit using Hosmer-Lemeshow Test
linpred=predict(model.final, newx = as.matrix(train.x), type = "response")

cs_train_m <- mutate(cs_train, predprob=predict(model.final, newx = as.matrix(train.x), type="response")
gdf <- group_by(cs_train_m, ntile(linpred, 1000)) # group up the data by eta_x into 100 groups
hldf <- summarise(gdf, y=sum(SeriousDlqin2yrs==1), ppred=mean(predprob), count=n())
head(hldf)
```

```
## # A tibble: 6 x 4
##   `ntile(linpred, 1000)`     y ppred count
##                    <int> <int> <dbl> <int>
## 1                      1     6 0.124    73
## 2                      2     5 0.188    73
## 3                      3     3 0.198    73
## 4                      4     0 0.205    73
## 5                      5     1 0.209    73
## 6                      6     4 0.213    73
```

```
# We adjust the size of the bins until there's only one group with less than 5
hldf[hldf$count<5,]
```

```
## # A tibble: 0 x 4
## # ... with 4 variables: ntile(linpred, 1000) <int>, y <int>, ppred <dbl>,
## #   count <int>
```

```
# Observed Proportion Confidence Interval vs Predicted Probability
hldf <- mutate(hldf, se.fit=sqrt(ppred*(1-ppred)/count))
```

```
## Warning in sqrt(ppred * (1 - ppred)/count): NaNs produced
```

```
ggplot(hldf,aes(x=ppred,y=y/count,ymin=y/count-2*se.fit, ymax=y/count+2*se.fit))+
  geom_point()+geom_linerange(color=grey(0.75))+
  geom_abline(intercept = 0,slope = 1)+
  xlab("Predicted Probability")+
  ylab("Observed Proportion")
```

```
## Warning: Removed 1 rows containing missing values (geom_segment).
```

```
# Hosmer-Lemeshow statistics
hlstat <- with(hldf, sum((y-count*ppred) ^2/(count * ppred * (1-ppred))))
c(hlstat, nrow(hldf))
```

```
## [1] 48107.41  1000.00
```

```
# The p-value is given by:
1-pchisq(hlstat, nrow(hldf)-2)
```

```
## [1] 0
```

AUC

5-3 Model Performance with Test Data

```
#Final Model(w/ interaction term ReugularMedicine * PhysicallyActive)
result_m2 = predict(model.final, newx= as.matrix(test.x), type="response")

head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```
pred_m2 = prediction(result_m2, test.y)


plot(performance(pred_m2, "acc")) #It seems like 0.52 cutoff has the highest accuracy
```

```
table(test.y, result_m2>0.2)
```

```
##
## test.y FALSE  TRUE
##      0   117 44575
##      1     2  3414
```

```
#Accuracy :
#Sensitivity :
#Specificity :
#The Specificity and accuracy improved a bit compared to the previous model without interaction term, s
plot(performance(pred_m2,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
#Now we calculate the area under the curve (AUC) and accuracy of the model given above (glmModel2)
auc_ROCR2 <- performance(pred_m2, measure = "auc")
auc_ROCR2@y.values[[1]]
```

```
## [1] 0.6752937
```

```
AIC_models <- data.frame(AIC_unbalanced,AIC_balanced)
AIC_models
```

```
##              AIC_unbalanced AIC_balanced
## PCA                35860.93   13658.5098
## Regular GLM        33396.05   13588.8303
## Ridge           -1505532.95    -175.3686
## Lasso           -2142094.89    -461.6335
```

```
#predict(kmeans_model_train, newdata=test.x, type="response")
prediction_result <- predict.glm(glm_pca_original_data, newdata = testing_data)
```

```
## Warning: 'newdata' had 48108 rows but variables found have 72161 rows
```

```
prediction_result <- prediction_result[1:length(test.y)]
head(test.y)
```

```
## [1] 0 0 0 0 0 0
```

```
prediction_pca = prediction(prediction_result, test.y)
plot(performance(prediction_pca, "acc"))
```

```
table(test.y, result_m2>0.2)
```

```
##
## test.y FALSE  TRUE
##      0   117 44575
##      1     2  3414
```

```
plot(performance(prediction_pca,"tpr","fpr"), colorize=T)
abline(0,1)
```

```
pca_auc_ROCR2 <- performance(prediction_pca, measure = "auc")
pca_auc_ROCR2@y.values[[1]]
```

```
## [1] 0.5073262
```

Maybe don't need session

(0) Ensemble Learning Used by Paper

- Lasso Ensemble Algorithm
- Aggregating base learner: Weighted base=learner

Not Sure if we use this!!

```
# Check how the model fits the data
# From model.final, we can calculate the difference in the two deviances from the summary(model): 987.2
#Number of regressors in the model: 813-802=11
pchisq(473.75,12)
```

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

```
#The area below 473.75 is one which means the area above it is almost zero. This means that our model h
print(paste("Pearson's X^2 =",round(sum(residuals(model.final,type="pearson")^2),3)))
```

```
## [1] "Pearson's X^2 = 0"
```

```
qchisq(0.95,802)
```

```
## [1] 868.9936
```

```
#781.61<868.99, so we fail to reject the null hypothesis and conclude that the logistic model fits the
```

```
sum(cs_train[,2])
```

```
## [1] 4941
```

```
sum(cs_test[,2])
```

```
## [1] 3416
```

Cluster Attempt

```
# Cluster Grouping Majority Data (Try to cluster data by age/monthly income)
set.seed(1) # for reproducibility

head(cs_train_maj)
```

```
##           X SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 30484 30484               0                           0.09474044  47
## 74216 74216               0                           0.05277307  68
## 54077 54077               0                           0.73665267  36
## 86784 86784               0                           0.02365700  36
## 14388 14388               0                           0.00581900  44
## 31442 31442               0                           0.11523783  40
##       NumberOfTime30.59DaysPastDueNotWorse  DebtRatio MonthlyIncome
## 30484                                    0 0.36842105          6250
## 74216                                    0 0.22759781         11884
## 54077                                    0 0.09445277          2000
## 86784                                    0 0.21710409          5600
## 14388                                    0 0.18525779          5100
## 31442                                    1 2.49168646          2946
##       NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 30484                               8                       0
## 74216                              13                       0
## 54077                               6                       0
## 86784                               9                       0
## 14388                              24                       0
## 31442                              17                       0
##       NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 30484                            1                                    0
## 74216                            2                                    0
## 54077                            0                                    0
## 86784                            1                                    0
## 14388                            1                                    0
## 31442                            3                                    0
##       NumberOfDependents
## 30484                  3
## 74216                  1
## 54077                  1
## 86784                  0
## 14388                  2
## 31442                  0
```

```r
# Test with smaller group based on monthly income range
cs_train_maj_g1 <- cs_train_maj[cs_train_maj$NA_Indicator==0,] # Filter out NA monthly income first
cs_train_maj_g1 <- cs_train_maj_g1[cs_train_maj_g1$MonthlyIncome<20000,]  #38035 obs
head(cs_train_maj_g1)
```

```
##  [1] X                                   SeriousDlqin2yrs
##  [3] RevolvingUtilizationOfUnsecuredLines age
##  [5] NumberOfTime30.59DaysPastDueNotWorse DebtRatio
##  [7] MonthlyIncome                       NumberOfOpenCreditLinesAndLoans
##  [9] NumberOfTimes90DaysLate             NumberRealEstateLoansOrLines
## [11] NumberOfTime60.89DaysPastDueNotWorse NumberOfDependents
## <0 rows> (or 0-length row.names)
```

```r
# Create a dat with the two predictors of interest
dat <- cs_train_maj_g1[,c(4,7)]  # Age and MonthlyIncome
head(dat)
```

```
## [1] age           MonthlyIncome
## <0 rows> (or 0-length row.names)
```

```r
n_maj <- nrow(dat) # get number of rows

# Initial assignments to three groups that will need to update
assignments <- factor(sample(c(1,2,3), n_maj, replace = TRUE))
#plot(dat, col=assignments, xlim = c(0,110), asp=1)
#plot(dat, col=assignments)
```

a) REMOVE SECTION - NOT APPLICABLE —Boostrapping Minority Data (cs_train_min_add) (1000 obs)

- Currently created 1000 additional data, can add more

```r
# Boostrapping Minority Data
set.seed(1) # for reproducibility
# set number of minority data to reproduce
n_add <- 1000

n_min <- nrow(cs_train_min)
n_min
```

```
## [1] 4941
```

```r
n_maj <- nrow(cs_train_maj)
index <- sample(n_min, n_add, replace = TRUE)
index_maj <- sample(n_maj, n_add, replace = TRUE)
#plot(density(index),  main="")  # show density curve of the index we randomized
hist(index, breaks = 100)
```

```
min(index)
```

```
## [1] 15
```

```
max(index)
```

```
## [1] 4939
```

```
length(index)
```

```
## [1] 1000
```

```
# We add the additional data for future analysis
cs_train_min_add <- cs_train_min[index,]
head(cs_train_min_add)
```

```
##             X SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 88154   88154                1                           0.03545848  33
## 64256   64256                1                           0.98335183  37
## 105760 105760                1                           1.46506986  37
## 137307 137307                1                           0.11727646  34
## 20062   20062                1                           0.67475736  53
## 47668   47668                1                           0.99989018  41
##        NumberOfTime30.59DaysPastDueNotWorse  DebtRatio MonthlyIncome
## 88154                                     3 0.29635182          2000
## 64256                                     2 0.32223968          7000
## 105760                                    0 0.21990439          2300
## 137307                                    0 0.08461026          1500
## 20062                                     0 2.16232772          3264
```

```
## 47668                                    0 0.07576094          4500
##        NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 88154                               10                       0
## 64256                                5                       0
## 105760                               5                       3
## 137307                               9                       0
## 20062                               21                       0
## 47668                                4                       0
##        NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 88154                             0                                     1
## 64256                             3                                     0
## 105760                            0                                     2
## 137307                            0                                     0
## 20062                             4                                     0
## 47668                             0                                     0
##        NumberOfDependents
## 88154                   0
## 64256                   1
## 105760                  2
## 137307                  4
## 20062                   0
## 47668                   0
```

```
cs_train_maj_add <- cs_train_maj[index_maj,]
head(cs_train_maj_add)
```

```
##             X SeriousDlqin2yrs RevolvingUtilizationOfUnsecuredLines age
## 39095   39095                0                             0.4191770  40
## 53178   53178                0                             0.1770347  54
## 134752 134752                0                             1.1369727  60
## 7328     7328                0                             0.1300842  48
## 101807 101807                0                             0.0317618  28
## 110064 110064                0                             0.0000000  83
##        NumberOfTime30.59DaysPastDueNotWorse   DebtRatio MonthlyIncome
## 39095                                    0   0.8230508          1474
## 53178                                    0   0.4121380          8666
## 134752                                   0   1.0512030          6483
## 7328                                     0   0.3726312         10500
## 101807                                   1 262.5000000             1
## 110064                                   0   0.0000000          5200
##        NumberOfOpenCreditLinesAndLoans NumberOfTimes90DaysLate
## 39095                                6                       1
## 53178                               11                       0
## 134752                              16                       0
## 7328                                10                       0
## 101807                              12                       0
## 110064                               1                       0
##        NumberRealEstateLoansOrLines NumberOfTime60.89DaysPastDueNotWorse
## 39095                             1                                     0
## 53178                             1                                     0
## 134752                            2                                     0
## 7328                              1                                     0
## 101807                            0                                     0
## 110064                            0                                     0
##        NumberOfDependents
```

```
## 39095                    2
## 53178                    2
## 134752                   0
## 7328                     1
## 101807                   2
## 110064                   0
```

```
nrow(cs_train_maj)
```

```
## [1] 67220
```

```
nrow(cs_train_maj_add)
```

```
## [1] 1000
```

5-2 Marginal Model Plots

Need to Update!!

```
# residual plots
#residualPlots(model.final)

# Marginial Model Plots
#library(car)
#mmp(model.final)
```

Maybe don't need session (END)