

# Data Prep

## Open Libraries

```
library("ggplot2", lib.loc="/Library/Frameworks/R.framework/Versions/3.4/Resources/library")
library("graphics", lib.loc="/Library/Frameworks/R.framework/Versions/3.4/Resources/library")
library("gplots", lib.loc="/Library/Frameworks/R.framework/Versions/3.4/Resources/library")

##
## Attaching package: 'gplots'

## The following object is masked from 'package:stats':
##
##      lowess

library("dplyr")

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##      filter, lag

## The following objects are masked from 'package:base':
##
##      intersect, setdiff, setequal, union

library("lattice", lib.loc="/Library/Frameworks/R.framework/Versions/3.4/Resources/library")
library("data.table", lib.loc="/Library/Frameworks/R.framework/Versions/3.4/Resources/library")

##
## Attaching package: 'data.table'

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

library("datasets")
library("readxl")
library("stats")
library("caret")
library("VIM")

## Loading required package: colorspace

## Loading required package: grid

## VIM is ready to use.
## Since version 4.0.0 the GUI is in its own package VIMGUI.
##
##      Please use the package to use the new (and old) GUI.

## Suggestions and bug-reports can be submitted at: https://github.com/alexkowa/VIM/issues

##
## Attaching package: 'VIM'
```

```

## The following object is masked from 'package:datasets':
##
##     sleep
library("dummies")

## dummies-1.5.6 provided by Decision Patterns

Import file for analysis

library(readxl)
AdmittedStudentsData <- read_excel("~/Dropbox/Practicum II/RFiles/AdmittedStudentsData.xlsx")

Rename Data Set

dataSet <- AdmittedStudentsData

Transform data set into data frame

dfDataSet <- as.data.frame(dataSet)
head(dfDataSet)

##      CWID Enrolling Sex Expel First.Gen Challenge Tag Pathway Tag
## 1 10820721      N    M     N      N              N          N
## 2 10826961      N    M     N      N              N          N
## 3 10695445      N    M     N      N              N          N
## 4 10810931      N    M     N      N              N          N
## 5 10738055      N    M     N      N              N          N
## 6 10804656      N    M     N      N              N          N
##   Boettcher.Semi Boettcher.Final Daniels.Semi Daniels.Final Harvey.App
## 1              N              N              N              N          N
## 2              N              N              N              N          N
## 3              N              N              N              N          N
## 4              N              N              N              N          N
## 5              N              N              N              N          N
## 6              N              N              N              N          N
##   Harvey.Final FC.App FC.Final Thorson.App Thorson.Admit Summet.App
## 1              N      N      N      N              N          N
## 2              N      N      N      N              N          N
## 3              N      N      N      N              N          N
## 4              N      N      N      N              N          N
## 5              N      N      N      N              N          N
## 6              N      N      N      N              N          N
##   Summet.Participant Mines.Medal SPS Veteran Legacy Athlete State
## 1              N      N      N      N      N      N      CO
## 2              N      N      N      N      N      N      Other
## 3              N      N      N      N      N      N      Other
## 4              N      N      N      N      N      N      CO
## 5              N      N      N      N      N      N      Other
## 6              N      N      N      N      N      N      CO
##   Citizenship      Ethnicity      Major.App
## 1 U.S. Citizen      Asian      Civil Engineering
## 2 U.S. Citizen      White Mechanical Engineering
## 3 U.S. Citizen      White Mechanical Engineering
## 4 U.S. Citizen      White Mechanical Engineering
## 5 U.S. Citizen Black or African American Mechanical Engineering
## 6 U.S. Citizen      White      Undecided
##   First Contact First Visit Sport App.Created.Days Age HS.GPA

```

```
## 1      ACT      None None      339 20 3.884000
## 2      ACT Campus Tour None      339 24 3.476000
## 3      GPA Form      None None      339 31 4.000000
## 4 Campus Visit Campus Visit None      339 35 3.162000
## 5 Royall Search      None None      335 35 3.897436
## 6 Campus Visit Campus Visit None      335 23 3.932000
## SATR.Converted Review.OutsideActivity Review.Leadership Review.WorkExp
## 1      1370      3      2      <NA>
## 2      1400      3      1      2
## 3      1400      1      0      0
## 4      1460      3      0      1
## 5      1370      1      1      0
## 6      1540      2      2      0
## Review.WorkEthic Review.ExpDiversity Review.DesireAttend Review.Affinity
## 1      <NA>      3      <NA>      <NA>
## 2      3      2      2      2
## 3      0      0      0      1
## 4      0      1      2      0
## 5      <NA>      1      <NA>      <NA>
## 6      2      1      3      2
## Review.InnovEntrep Review.Teamwork Review.OverallFit Logins.60Days
## 1      <NA>      3      7      0
## 2      0      <NA>      8      0
## 3      0      0      7      0
## 4      0      1      8      0
## 5      <NA>      <NA>      8      0
## 6      0      2      7      0
## EventCount.All EventCount.Admitted EventCount.Campus
## 1      0      0      0
## 2      1      0      1
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
```

Remove ID

```
dfDataSet <-dfDataSet[-(1)]
```

Summary

```
summary(dfDataSet)
```

```
## Enrolling      Sex      Expel
## Length:6235      Length:6235      Length:6235
## Class :character      Class :character      Class :character
## Mode :character      Mode :character      Mode :character
##
##
##
## First.Gen      Challenge Tag      Pathway Tag
## Length:6235      Length:6235      Length:6235
## Class :character      Class :character      Class :character
## Mode :character      Mode :character      Mode :character
##
```

```

##
##
##
## Boettcher.Semi      Boettcher.Final      Daniels.Semi
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## Daniels.Final       Harvey.App             Harvey.Final
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## FC.App              FC.Final              Thorson.App
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## Thorson.Admit       Summet.App            Summet.Participant
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## Mines.Medal         SPS                   Veteran
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## Legacy              Athlete               State
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character
## Mode :character     Mode :character      Mode :character
##
##
##
##
## Citizenship         Ethnicity             Major.App
## Length:6235         Length:6235           Length:6235
## Class :character    Class :character      Class :character

```

```

## Mode :character Mode :character Mode :character
##
##
##
## First Contact      First Visit      Sport
## Length:6235      Length:6235      Length:6235
## Class :character  Class :character  Class :character
## Mode :character   Mode :character   Mode :character
##
##
##
## App.Created.Days   Age              HS.GPA           SATR.Converted
## Min. : 69.0 Min. :18.00 Min. :1.556 Min. : 920
## 1st Qu.: 278.0 1st Qu.:23.00 1st Qu.:3.708 1st Qu.:1340
## Median : 300.0 Median :28.00 Median :3.882 Median :1400
## Mean : 300.1 Mean :27.83 Mean :3.814 Mean :1395
## 3rd Qu.: 328.0 3rd Qu.:32.00 3rd Qu.:3.980 3rd Qu.:1460
## Max. :42967.0 Max. :70.00 Max. :4.000 Max. :1600
##              NA's :386 NA's :488
## Review.OutsideActivity Review.Leadership Review.WorkExp
## Length:6235      Length:6235      Length:6235
## Class :character  Class :character  Class :character
## Mode :character   Mode :character   Mode :character
##
##
##
## Review.WorkEthic   Review.ExpDiversity Review.DesireAttend
## Length:6235      Length:6235      Length:6235
## Class :character  Class :character  Class :character
## Mode :character   Mode :character   Mode :character
##
##
##
## Review.Affinity     Review.InnovEntrep Review.Teamwork
## Length:6235      Length:6235      Length:6235
## Class :character  Class :character  Class :character
## Mode :character   Mode :character   Mode :character
##
##
##
## Review.OverallFit Logins.60Days      EventCount.All      EventCount.Admitted
## Length:6235      Min. : 0.000 Min. :0.0000 Min. :0.0000
## Class :character  1st Qu.: 0.000 1st Qu.:0.0000 1st Qu.:0.0000
## Mode :character   Median : 0.000 Median :0.0000 Median :0.0000
##                  Mean : 0.017 Mean :0.4933 Mean :0.2719
##                  3rd Qu.: 0.000 3rd Qu.:1.0000 3rd Qu.:0.0000
##                  Max. :21.000 Max. :6.0000 Max. :4.0000
##
## EventCount.Campus

```

```
## Min.      :0.0000
## 1st Qu.:0.0000
## Median :0.0000
## Mean      :0.4529
## 3rd Qu.:1.0000
## Max.      :6.0000
##
```

Structure of the data

```
str(dfDataSet)
```

```
## 'data.frame': 6235 obs. of 48 variables:
## $ Enrolling      : chr  "N" "N" "N" "N" ...
## $ Sex            : chr  "M" "M" "M" "M" ...
## $ Expel          : chr  "N" "N" "N" "N" ...
## $ First.Gen      : chr  "N" "N" "N" "N" ...
## $ Challenge Tag  : chr  "N" "N" "N" "N" ...
## $ Pathway Tag    : chr  "N" "N" "N" "N" ...
## $ Boettcher.Semi : chr  "N" "N" "N" "N" ...
## $ Boettcher.Final : chr  "N" "N" "N" "N" ...
## $ Daniels.Semi   : chr  "N" "N" "N" "N" ...
## $ Daniels.Final  : chr  "N" "N" "N" "N" ...
## $ Harvey.App     : chr  "N" "N" "N" "N" ...
## $ Harvey.Final   : chr  "N" "N" "N" "N" ...
## $ FC.App         : chr  "N" "N" "N" "N" ...
## $ FC.Final       : chr  "N" "N" "N" "N" ...
## $ Thorson.App    : chr  "N" "N" "N" "N" ...
## $ Thorson.Admit  : chr  "N" "N" "N" "N" ...
## $ Summet.App     : chr  "N" "N" "N" "N" ...
## $ Summet.Participant : chr  "N" "N" "N" "N" ...
## $ Mines.Medal    : chr  "N" "N" "N" "N" ...
## $ SPS            : chr  "N" "N" "N" "N" ...
## $ Veteran        : chr  "N" "N" "N" "N" ...
## $ Legacy         : chr  "N" "N" "N" "N" ...
## $ Athlete        : chr  "N" "N" "N" "N" ...
## $ State          : chr  "CO" "Other" "Other" "CO" ...
## $ Citizenship    : chr  "U.S. Citizen" "U.S. Citizen" "U.S. Citizen" "U.S. Citizen" ...
## $ Ethnicity      : chr  "Asian" "White" "White" "White" ...
## $ Major.App      : chr  "Civil Engineering" "Mechanical Engineering" "Mechanical Engineering" ...
## $ First Contact  : chr  "ACT" "ACT" "GPA Form" "Campus Visit" ...
## $ First Visit    : chr  "None" "Campus Tour" "None" "Campus Visit" ...
## $ Sport          : chr  "None" "None" "None" "None" ...
## $ App.Created.Days : num  339 339 339 339 335 335 333 333 333 333 ...
## $ Age            : num  20 24 31 35 35 23 33 18 19 19 ...
## $ HS.GPA         : num  3.88 3.48 4 3.16 3.9 ...
## $ SATR.Converted : num  1370 1400 1400 1460 1370 1540 1190 NA 1430 1350 ...
## $ Review.OutsideActivity: chr  "3" "3" "1" "3" ...
## $ Review.Leadership : chr  "2" "1" "0" "0" ...
## $ Review.WorkExp   : chr  NA "2" "0" "1" ...
## $ Review.WorkEthic : chr  NA "3" "0" "0" ...
## $ Review.ExpDiversity : chr  "3" "2" "0" "1" ...
## $ Review.DesireAttend : chr  NA "2" "0" "2" ...
## $ Review.Affinity  : chr  NA "2" "1" "0" ...
## $ Review.InnovEntrep : chr  NA "0" "0" "0" ...
```

```
## $ Review.Teamwork      : chr  "3" NA "0" "1" ...
## $ Review.OverallFit    : chr  "7" "8" "7" "8" ...
## $ Logins.60Days        : num  0 0 0 0 0 0 0 0 0 0 ...
## $ EventCount.All       : num  0 1 0 0 0 0 0 0 0 2 ...
## $ EventCount.Admitted  : num  0 0 0 0 0 0 0 0 0 2 ...
## $ EventCount.Campus    : num  0 1 0 0 0 0 0 0 0 2 ...
```

```
head(dfDataSet)
```

```
## Enrolling Sex Expel First.Gen Challenge Tag Pathway Tag Boettcher.Semi
## 1          N   M    N          N          N          N          N
## 2          N   M    N          N          N          N          N
## 3          N   M    N          N          N          N          N
## 4          N   M    N          N          N          N          N
## 5          N   M    N          N          N          N          N
## 6          N   M    N          N          N          N          N
## Boettcher.Final Daniels.Semi Daniels.Final Harvey.App Harvey.Final
## 1          N          N          N          N          N
## 2          N          N          N          N          N
## 3          N          N          N          N          N
## 4          N          N          N          N          N
## 5          N          N          N          N          N
## 6          N          N          N          N          N
## FC.App FC.Final Thorson.App Thorson.Admit Summet.App Summet.Participant
## 1          N          N          N          N          N
## 2          N          N          N          N          N
## 3          N          N          N          N          N
## 4          N          N          N          N          N
## 5          N          N          N          N          N
## 6          N          N          N          N          N
## Mines.Medal SPS Veteran Legacy Athlete State Citizenship
## 1          N   N          N   N          N   CO U.S. Citizen
## 2          N   N          N   N          N   Other U.S. Citizen
## 3          N   N          N   N          N   Other U.S. Citizen
## 4          N   N          N   N          N   CO U.S. Citizen
## 5          N   N          N   N          N   Other U.S. Citizen
## 6          N   N          N   N          N   CO U.S. Citizen
## Ethnicity Major.App First Contact
## 1          Asian      Civil Engineering      ACT
## 2          White Mechanical Engineering      ACT
## 3          White Mechanical Engineering      GPA Form
## 4          White Mechanical Engineering      Campus Visit
## 5 Black or African American Mechanical Engineering Royall Search
## 6          White      Undecided      Campus Visit
## First Visit Sport App.Created.Days Age HS.GPA SATR.Converted
## 1          None   None          339 20 3.884000      1370
## 2 Campus Tour   None          339 24 3.476000      1400
## 3          None   None          339 31 4.000000      1400
## 4 Campus Visit   None          339 35 3.162000      1460
## 5          None   None          335 35 3.897436      1370
## 6 Campus Visit   None          335 23 3.932000      1540
## Review.OutsideActivity Review.Leadership Review.WorkExp Review.WorkEthic
## 1          3          2          <NA>          <NA>
## 2          3          1          2          3
## 3          1          0          0          0
```

```
## 4          3          0          1          0
## 5          1          1          0        <NA>
## 6          2          2          0          2
##   Review.ExpDiversity Review.DesireAttend Review.Affinity
## 1          3        <NA>        <NA>
## 2          2          2          2
## 3          0          0          1
## 4          1          2          0
## 5          1        <NA>        <NA>
## 6          1          3          2
##   Review.InnovEntrep Review.Teamwork Review.OverallFit Logins.60Days
## 1        <NA>          3          7          0
## 2          0        <NA>          8          0
## 3          0          0          7          0
## 4          0          1          8          0
## 5        <NA>        <NA>          8          0
## 6          0          2          7          0
##   EventCount.All EventCount.Admitted EventCount.Campus
## 1          0          0          0
## 2          1          0          1
## 3          0          0          0
## 4          0          0          0
## 5          0          0          0
## 6          0          0          0
```

## Transform Variable's type to the appropriate data type

```
dfDataSet[1:30] <- lapply(dfDataSet[1:30], as.factor)
dfDataSet[35:44] <- lapply(dfDataSet[35:44], as.numeric)
str(dfDataSet)
```

```
## 'data.frame':    6235 obs. of  48 variables:
## $ Enrolling      : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 2 ...
## $ Sex            : Factor w/ 2 levels "F","M": 2 2 2 2 2 2 1 2 1 1 ...
## $ Expel          : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 2 1 1 1 ...
## $ First.Gen      : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 2 1 1 1 ...
## $ Challenge Tag   : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Pathway Tag     : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Semi  : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Final : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Semi    : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Final   : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.App      : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.Final    : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ FC.App          : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ FC.Final        : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Thorson.App     : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Thorson.Admit   : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Summet.App      : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Summet.Participant : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Mines.Medal     : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ SPS             : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Veteran         : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
```



```
## $ Legacy : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Athlete : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ State : Factor w/ 2 levels "CO","Other": 1 2 2 1 2 1 2 2 2 2 ...
## $ Citizenship : Factor w/ 6 levels "Foreign National/International",...: 4 4 4 4 4 4 1 4 4 4
## $ Ethnicity : Factor w/ 10 levels "American Indian or Alaska Native",...: 2 10 10 10 3 10 10 10 10 10
## $ Major.App : Factor w/ 21 levels "Applied Mathematics & Statistics - Computational & A...: 1 1 1 1 1 1 1 1 1 1 ...
## $ First Contact : Factor w/ 17 levels "ACT","Application",...: 1 1 8 4 15 4 16 15 4 4 ...
## $ First Visit : Factor w/ 12 levels "Campus Tour",...: 10 1 10 2 10 2 10 10 2 2 ...
## $ Sport : Factor w/ 14 levels "Men's Varsity Baseball",...: 7 7 7 7 7 7 7 7 7 7 ...
## $ App.Created.Days : num 339 339 339 339 335 335 333 333 333 333 ...
## $ Age : num 20 24 31 35 35 23 33 18 19 19 ...
## $ HS.GPA : num 3.88 3.48 4 3.16 3.9 ...
## $ SATR.Converted : num 1370 1400 1400 1460 1370 1540 1190 NA 1430 1350 ...
## $ Review.OutsideActivity: num 3 3 1 3 1 2 3 2 2 3 ...
## $ Review.Leadership : num 2 1 0 0 1 2 3 0 1 3 ...
## $ Review.WorkExp : num NA 2 0 1 0 0 0 1 0 3 ...
## $ Review.WorkEthic : num NA 3 0 0 NA 2 NA 1 2 3 ...
## $ Review.ExpDiversity : num 3 2 0 1 1 1 3 1 2 2 ...
## $ Review.DesireAttend : num NA 2 0 2 NA 3 NA 1 3 3 ...
## $ Review.Affinity : num NA 2 1 0 NA 2 NA 1 2 3 ...
## $ Review.InnovEntrep : num NA 0 0 0 NA 0 NA 0 1 3 ...
## $ Review.Teamwork : num 3 NA 0 1 NA 2 NA NA 2 NA ...
## $ Review.OverallFit : num 7 8 7 8 8 7 5 6 8 10 ...
## $ Logins.60Days : num 0 0 0 0 0 0 0 0 0 0 ...
## $ EventCount.All : num 0 1 0 0 0 0 0 0 0 2 ...
## $ EventCount.Admitted : num 0 0 0 0 0 0 0 0 0 2 ...
## $ EventCount.Campus : num 0 1 0 0 0 0 0 0 0 2 ...
```

```
summary(dfDataSet)
```

```
## Enrolling Sex      Expel      First.Gen Challenge Tag Pathway Tag
## N:4919      F:2046      N:6158      N:5677      N:6109      N:6235
## Y:1316      M:4189      Y: 77      Y: 558      Y: 126
##
##
##
##
## Boettcher.Semi Boettcher.Final Daniels.Semi Daniels.Final Harvey.App
## N:6137      N:6210      N:6162      N:6210      N:5675
## Y: 98      Y: 25      Y: 73      Y: 25      Y: 560
##
##
##
##
## Harvey.Final FC.App      FC.Final Thorson.App Thorson.Admit Summet.App
## N:6188      N:6148      N:6235      N:5972      N:6080      N:6235
## Y: 47      Y: 87      Y: 263      Y: 155
##
##
##
##
## Summet.Participant Mines.Medal SPS      Veteran Legacy Athlete
```

```

## N:6214          N:6232          N:6193          N:5808          N:5778          N:6072
## Y: 21           Y: 3            Y: 42          Y: 427          Y: 457          Y: 163
##
##
##
##
## State                               Citizenship
## CO :1887 Foreign National/International : 210
## Other:4348 International : 10
## Missing : 12
## U.S. Citizen :5905
## U.S. Permanent Resident/Green Card Holder: 85
## Undocumented/DACA : 13
##
## Ethnicity
## White :4760
## Asian : 623
## Hispanic or Latino : 322
## NotDeclared : 295
## Black or African American : 107
## American Indian or Alaska Native: 81
## (Other) : 47
##
## Major.App
## Mechanical Engineering :1489
## Computer Science : 628
## Chemical Engineering : 541
## Chemical Engineering - Biological Engineering Specialty: 502
## Undecided : 501
## Electrical Engineering : 435
## (Other) :2139
##
## First Contact First Visit
## Royall Search:2477 None :3698
## FUF : 963 Campus Visit : 942
## Application : 950 Campus Tour : 537
## Campus Visit : 782 Preview Mines In Your City: 241
## ACT : 589 Discover Mines : 209
## SAT : 151 Launch : 198
## (Other) : 323 (Other) : 410
##
## Sport App.Created.Days Age
## None :5753 Min. : 69.0 Min. :18.00
## Men's Varsity Football : 85 1st Qu.: 278.0 1st Qu.:23.00
## Men's Varsity Wrestling : 15 Median : 300.0 Median :28.00
## Varsity Track/Field : 15 Mean : 300.1 Mean :27.83
## Men's Varsity Basketball: 9 3rd Qu.: 328.0 3rd Qu.:32.00
## (Other) : 39 Max. :42967.0 Max. :70.00
## NA's : 319
##
## HS.GPA SATR.Converted Review.OutsideActivity Review.Leadership
## Min. :1.556 Min. : 920 Min. :0.000 Min. :0.000
## 1st Qu.:3.708 1st Qu.:1340 1st Qu.:2.000 1st Qu.:0.000
## Median :3.882 Median :1400 Median :3.000 Median :1.000
## Mean :3.814 Mean :1395 Mean :2.399 Mean :1.345
## 3rd Qu.:3.980 3rd Qu.:1460 3rd Qu.:3.000 3rd Qu.:2.000
## Max. :4.000 Max. :1600 Max. :3.000 Max. :3.000

```

```
## NA's :386 NA's :488 NA's :204 NA's :204
## Review.WorkExp Review.WorkEthic Review.ExpDiversity Review.DesireAttend
## Min. :0.000 Min. :0.000 Min. :0.000 Min. :0.000
## 1st Qu.:1.000 1st Qu.:2.000 1st Qu.:2.000 1st Qu.:1.000
## Median :1.000 Median :3.000 Median :2.000 Median :2.000
## Mean :1.298 Mean :2.402 Mean :2.223 Mean :1.684
## 3rd Qu.:2.000 3rd Qu.:3.000 3rd Qu.:3.000 3rd Qu.:3.000
## Max. :3.000 Max. :3.000 Max. :3.000 Max. :3.000
## NA's :767 NA's :1311 NA's :204 NA's :1311
## Review.Affinity Review.InnovEntrep Review.Teamwork Review.OverallFit
## Min. :0.0 Min. :0.0000 Min. :0.000 Min. : 0.000
## 1st Qu.:1.0 1st Qu.:0.0000 1st Qu.:1.000 1st Qu.: 7.000
## Median :2.0 Median :0.0000 Median :2.000 Median : 8.000
## Mean :1.5 Mean :0.6564 Mean :1.972 Mean : 7.728
## 3rd Qu.:2.0 3rd Qu.:1.0000 3rd Qu.:3.000 3rd Qu.: 9.000
## Max. :3.0 Max. :3.0000 Max. :3.000 Max. :10.000
## NA's :1311 NA's :1311 NA's :202 NA's :33
## Logins.60Days EventCount.All EventCount.Admitted EventCount.Campus
## Min. : 0.000 Min. :0.0000 Min. :0.0000 Min. :0.0000
## 1st Qu.: 0.000 1st Qu.:0.0000 1st Qu.:0.0000 1st Qu.:0.0000
## Median : 0.000 Median :0.0000 Median :0.0000 Median :0.0000
## Mean : 0.017 Mean :0.4933 Mean :0.2719 Mean :0.4529
## 3rd Qu.: 0.000 3rd Qu.:1.0000 3rd Qu.:0.0000 3rd Qu.:1.0000
## Max. :21.000 Max. :6.0000 Max. :4.0000 Max. :6.0000
##
```

Create a table from the dataframe.

```
tbDataSet <- data.table(dfDataSet)
tbDataSet
```

```
## Enrolling Sex Expel First.Gen Challenge Tag Pathway Tag
## 1: N M N N N N
## 2: N M N N N N
## 3: N M N N N N
## 4: N M N N N N
## 5: N M N N N N
## ---
## 6231: Y M N N N N
## 6232: Y M N N N N
## 6233: Y M Y N N N
## 6234: N M N N N N
## 6235: N M N N N N
## Boettcher.Semi Boettcher.Final Daniels.Semi Daniels.Final Harvey.App
## 1: N N N N N
## 2: N N N N N
## 3: N N N N N
## 4: N N N N N
## 5: N N N N N
## ---
## 6231: N N N N N
## 6232: N N N N N
## 6233: N N N N N
## 6234: N N N N N
## 6235: N N N N N
```

##	Harvey.Final	FC.App	FC.Final	Thorson.App	Thorson.Admit	Summet.App	
##	1:	N	N	N	N	N	N
##	2:	N	N	N	N	N	N
##	3:	N	N	N	N	N	N
##	4:	N	N	N	N	N	N
##	5:	N	N	N	N	N	N
##	---						
##	6231:	N	N	N	N	N	N
##	6232:	N	N	N	N	N	N
##	6233:	N	N	N	N	N	N
##	6234:	N	N	N	N	N	N
##	6235:	N	N	N	N	N	N
##	Summet.Participant	Mines.Medal	SPS	Veteran	Legacy	Athlete	State
##	1:	N	N	N	N	N	CO
##	2:	N	N	N	N	N	Other
##	3:	N	N	N	N	N	Other
##	4:	N	N	N	N	N	CO
##	5:	N	N	N	N	N	Other
##	---						
##	6231:	N	N	N	N	N	CO
##	6232:	N	N	N	N	N	CO
##	6233:	N	N	N	N	N	CO
##	6234:	N	N	N	N	N	CO
##	6235:	N	N	N	N	N	Other
##	Citizenship						
##	1: U.S. Citizen						
##	2: U.S. Citizen						
##	3: U.S. Citizen						
##	4: U.S. Citizen						
##	5: U.S. Citizen	Black or African	American				
##	---						
##	6231: U.S. Citizen			White			
##	6232: U.S. Citizen			White			
##	6233: U.S. Citizen			White			
##	6234: U.S. Citizen			White			
##	6235: U.S. Citizen			White			
##	Major.App	First Contact					
##	1:	Civil Engineering		ACT			
##	2:	Mechanical Engineering		ACT			
##	3:	Mechanical Engineering		GPA Form			
##	4:	Mechanical Engineering		Campus Visit			
##	5:	Mechanical Engineering		Royall Search			
##	---						
##	6231:	Geological Engineering		Application			
##	6232:	Mechanical Engineering		Application			
##	6233:	Computer Science		Application			
##	6234:	Computer Science		Application			
##	6235:	Metallurgical & Materials Engineering		Application			
##	First Visit	Sport	App.Created.Days	Age	HS.GPA		
##	1:	None	None	339	20	3.884000	
##	2:	Campus Tour	None	339	24	3.476000	
##	3:	None	None	339	31	4.000000	
##	4:	Campus Visit	None	339	35	3.162000	
##	5:	None	None	335	35	3.897436	

```

## ---
## 6231: Preview Mines In Your City    NA           87  29 2.534000
## 6232: Preview Mines In Your City    NA           81  62      NA
## 6233:                               None  None      80  30 3.340000
## 6234:                               Campus Tour    NA           69  27      NA
## 6235:                               None    NA      42967  32      NA
##      SATR.Converted Review.OutsideActivity Review.Leadership
## 1:           1370                3                2
## 2:           1400                3                1
## 3:           1400                1                0
## 4:           1460                3                0
## 5:           1370                1                1
## ---
## 6231:           NA                NA                NA
## 6232:           NA                2                2
## 6233:          1540                2                2
## 6234:           NA                2                2
## 6235:           NA                3                2
##      Review.WorkExp Review.WorkEthic Review.ExpDiversity
## 1:           NA                NA                3
## 2:            2                3                2
## 3:            0                0                0
## 4:            1                0                1
## 5:            0                NA                1
## ---
## 6231:            1                3                NA
## 6232:            2                3                2
## 6233:            1                2                2
## 6234:            1                NA                1
## 6235:            2                NA                3
##      Review.DesireAttend Review.Affinity Review.InnovEntrep
## 1:           NA                NA                NA
## 2:            2                2                0
## 3:            0                1                0
## 4:            2                0                0
## 5:           NA                NA                NA
## ---
## 6231:            3                3                0
## 6232:            2                3                2
## 6233:            2                2                1
## 6234:           NA                NA                NA
## 6235:           NA                NA                NA
##      Review.Teamwork Review.OverallFit Logins.60Days EventCount.All
## 1:            3                7                0                0
## 2:           NA                8                0                1
## 3:            0                7                0                0
## 4:            1                8                0                0
## 5:           NA                8                0                0
## ---
## 6231:            0                8                0                1
## 6232:            2                8                0                1
## 6233:            3                8                0                0
## 6234:            2                8                0                2
## 6235:            0                8                0                0

```

```
##      EventCount.Admitted EventCount.Campus
##    1:                   0                   0
##    2:                   0                   1
##    3:                   0                   0
##    4:                   0                   0
##    5:                   0                   0
##   ---
## 6231:                   0                   0
## 6232:                   0                   0
## 6233:                   0                   0
## 6234:                   0                   1
## 6235:                   0                   0
```

```
tb <- table(dfDataSet$Enrolling)
tb
```

```
##
##      N      Y
## 4919 1316
```

Create table with percentages of total

```
tb.prop <- dfDataSet$Enrolling %>%
  table() %>%
  prop.table() %>% {. * 100} %>%
  round(2)
```

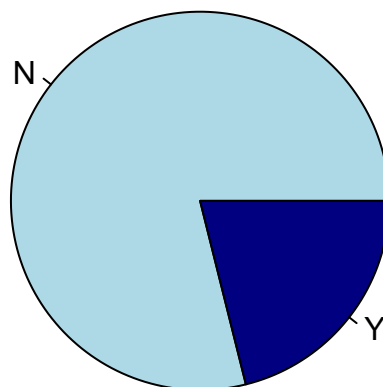
```
tb.prop
```

```
## .
##      N      Y
## 78.89 21.11
```

Create a Pie chart

```
pie(tb, main = "Percentage of Enrolled Students from Accepted Students", col = c("Light Blue", "Navy Blue"))
```

## Percentage of Enrolled Students from Accepted Students



Create a Bar chart

```
barplot(tb, col = "navy blue", ylim =c(0,5000) , main = "Number of Enrolled Students from Accepted Stud
```

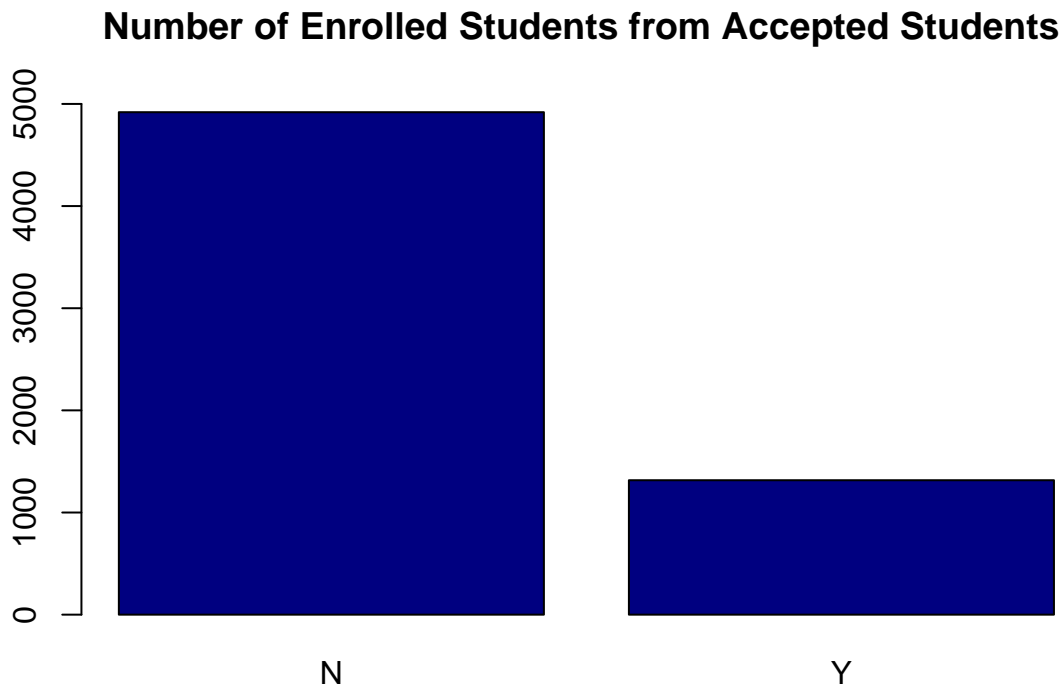
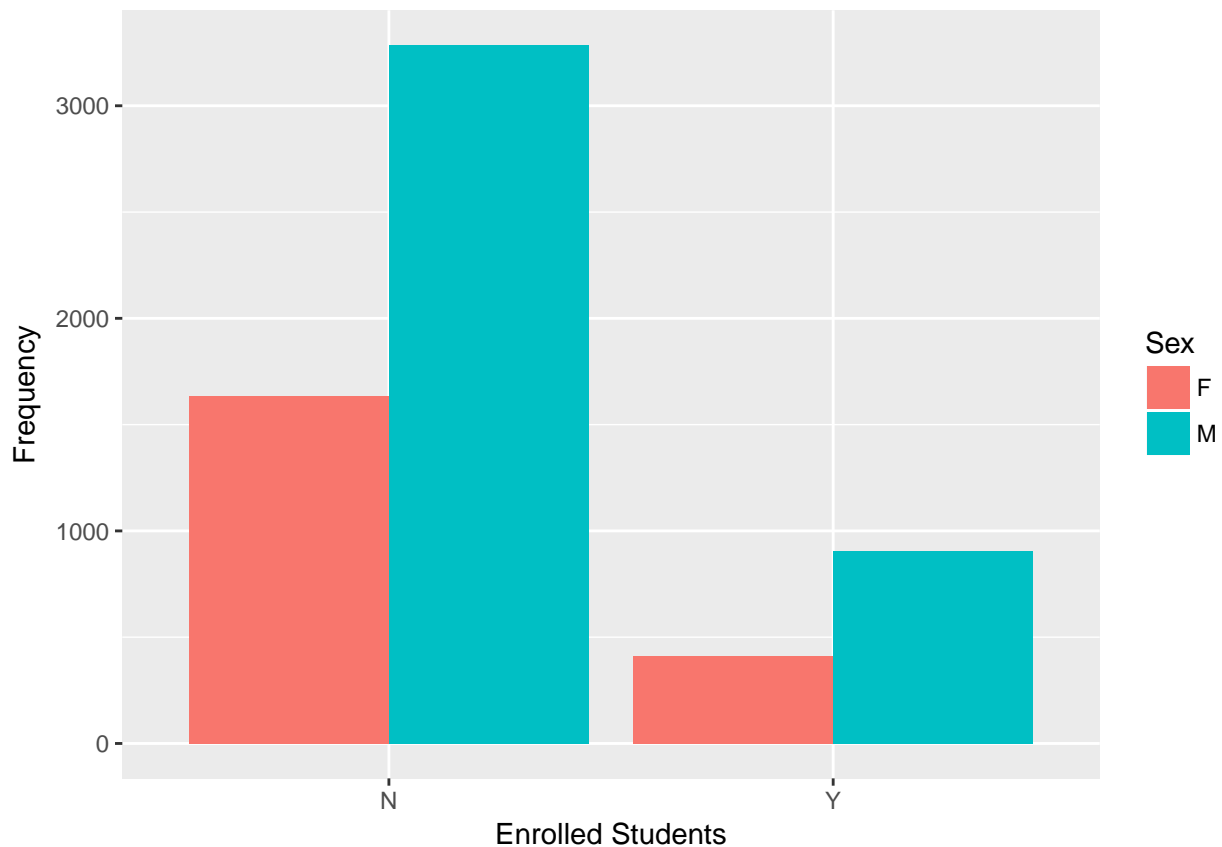


chart for for students enrolled and gender of students.

```
ggplot(dfDataSet) +  
  geom_bar(aes(x = factor(Enrolling), fill = Sex), position = 'dodge') +  
  xlab('Enrolled Students') + ylab('Frequency')
```

Create a bar-



## NA Imputation using kNN

```
dfDataSetKNN <- kNN(dfDataSet)
dfDataSetKNN <- subset(dfDataSetKNN, select = Enrolling:EventCount.Campus)
summary(dfDataSetKNN)
```

```
## Enrolling Sex      Expel    First.Gen Challenge Tag Pathway Tag
## N:4919    F:2046    N:6158    N:5677    N:6109      N:6235
## Y:1316    M:4189    Y: 77    Y: 558    Y: 126
##
##
##
##
## Boettcher.Semi Boettcher.Final Daniels.Semi Daniels.Final Harvey.App
## N:6137          N:6210          N:6162          N:6210          N:5675
## Y: 98          Y: 25          Y: 73          Y: 25          Y: 560
##
##
##
##
## Harvey.Final FC.App    FC.Final Thorson.App Thorson.Admit Summet.App
## N:6188          N:6148    N:6235    N:5972    N:6080    N:6235
## Y: 47          Y: 87          Y: 263    Y: 155
```



```

##
##
##
##
## Summet.Participant Mines.Medal SPS      Veteran Legacy  Athlete
## N:6214             N:6232      N:6193   N:5808   N:5778   N:6072
## Y: 21              Y: 3        Y: 42    Y: 427   Y: 457   Y: 163
##
##
##
##
## State                               Citizenship
## CO :1887   Foreign National/International : 210
## Other:4348 International                : 10
##           Missing                      : 12
##           U.S. Citizen                  :5905
##           U.S. Permanent Resident/Green Card Holder: 85
##           Undocumented/DACA             : 13
##
##           Ethnicity
## White :4760
## Asian : 623
## Hispanic or Latino : 322
## NotDeclared : 295
## Black or African American : 107
## American Indian or Alaska Native: 81
## (Other) : 47
##
##           Major.App
## Mechanical Engineering :1489
## Computer Science : 628
## Chemical Engineering : 541
## Chemical Engineering - Biological Engineering Specialty: 502
## Undecided : 501
## Electrical Engineering : 435
## (Other) :2139
##           First Contact           First Visit
## Royall Search:2477   None :3698
## FUF : 963   Campus Visit : 942
## Application : 950   Campus Tour : 537
## Campus Visit : 782   Preview Mines In Your City: 241
## ACT : 589   Discover Mines : 209
## SAT : 151   Launch : 198
## (Other) : 323   (Other) : 410
##           Sport      App.Created.Days      Age
## None :6072   Min. : 69.0   Min. :18.00
## Men's Varsity Football : 85   1st Qu.: 278.0   1st Qu.:23.00
## Men's Varsity Wrestling : 15   Median : 300.0   Median :28.00
## Varsity Track/Field : 15   Mean : 300.1   Mean :27.83
## Men's Varsity Basketball : 9   3rd Qu.: 328.0   3rd Qu.:32.00
## Women's Varsity Basketball: 7   Max. :42967.0   Max. :70.00
## (Other) : 32
##           HS.GPA      SATR.Convert Review.OutsideActivity Review.Leadership

```

```
## Min. :1.556 Min. : 920 Min. :0.0 Min. :0.000
## 1st Qu.:3.700 1st Qu.:1340 1st Qu.:2.0 1st Qu.:0.000
## Median :3.871 Median :1400 Median :3.0 Median :1.000
## Mean :3.806 Mean :1394 Mean :2.4 Mean :1.342
## 3rd Qu.:3.979 3rd Qu.:1460 3rd Qu.:3.0 3rd Qu.:2.000
## Max. :4.000 Max. :1600 Max. :3.0 Max. :3.000
##
## Review.WorkExp Review.WorkEthic Review.ExpDiversity Review.DesireAttend
## Min. :0.0 Min. :0.000 Min. :0.000 Min. :0.000
## 1st Qu.:1.0 1st Qu.:2.000 1st Qu.:2.000 1st Qu.:1.000
## Median :1.0 Median :3.000 Median :2.000 Median :2.000
## Mean :1.3 Mean :2.426 Mean :2.222 Mean :1.778
## 3rd Qu.:2.0 3rd Qu.:3.000 3rd Qu.:3.000 3rd Qu.:3.000
## Max. :3.0 Max. :3.000 Max. :3.000 Max. :3.000
##
## Review.Affinity Review.InnovEntrep Review.Teamwork Review.OverallFit
## Min. :0.000 Min. :0.0000 Min. :0.000 Min. : 0.000
## 1st Qu.:1.000 1st Qu.:0.0000 1st Qu.:1.000 1st Qu.: 7.000
## Median :2.000 Median :0.0000 Median :2.000 Median : 8.000
## Mean :1.596 Mean :0.6468 Mean :1.975 Mean : 7.732
## 3rd Qu.:2.000 3rd Qu.:1.0000 3rd Qu.:3.000 3rd Qu.: 9.000
## Max. :3.000 Max. :3.0000 Max. :3.000 Max. :10.000
##
## Logins.60Days EventCount.All EventCount.Admitted EventCount.Campus
## Min. : 0.000 Min. :0.0000 Min. :0.0000 Min. :0.0000
## 1st Qu.: 0.000 1st Qu.:0.0000 1st Qu.:0.0000 1st Qu.:0.0000
## Median : 0.000 Median :0.0000 Median :0.0000 Median :0.0000
## Mean : 0.017 Mean :0.4933 Mean :0.2719 Mean :0.4529
## 3rd Qu.: 0.000 3rd Qu.:1.0000 3rd Qu.:0.0000 3rd Qu.:1.0000
## Max. :21.000 Max. :6.0000 Max. :4.0000 Max. :6.0000
##
```

```
str(dfDataSetKNN)
```

```
## 'data.frame': 6235 obs. of 48 variables:
## $ Enrolling : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 2 ...
## $ Sex : Factor w/ 2 levels "F","M": 2 2 2 2 2 2 1 2 1 1 ...
## $ Expel : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 2 1 1 1 ...
## $ First.Gen : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 2 1 1 1 ...
## $ Challenge Tag : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Pathway Tag : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Semi : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Final : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Semi : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Final : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.App : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.Final : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ FC.App : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ FC.Final : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Thorson.App : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Thorson.Admit : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Summet.App : Factor w/ 1 level "N": 1 1 1 1 1 1 1 1 1 1 ...
## $ Summet.Participant : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ Mines.Medal : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
## $ SPS : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 1 ...
```

```
## $ Veteran      : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 ...
## $ Legacy       : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 ...
## $ Athlete      : Factor w/ 2 levels "N","Y": 1 1 1 1 1 1 1 1 1 ...
## $ State        : Factor w/ 2 levels "CO","Other": 1 2 2 1 2 1 2 2 2 ...
## $ Citizenship  : Factor w/ 6 levels "Foreign National/International",...: 4 4 4 4 4 4 1 4 4
## $ Ethnicity    : Factor w/ 10 levels "American Indian or Alaska Native",...: 2 10 10 10 3 1
## $ Major.App    : Factor w/ 21 levels "Applied Mathematics & Statistics - Computational & A
## $ First Contact : Factor w/ 17 levels "ACT","Application",...: 1 1 8 4 15 4 16 15 4 4 ...
## $ First Visit  : Factor w/ 12 levels "Campus Tour",...: 10 1 10 2 10 2 10 10 2 2 ...
## $ Sport        : Factor w/ 14 levels "Men's Varsity Baseball",...: 7 7 7 7 7 7 7 7 7 ...
## $ App.Created.Days : num 339 339 339 339 335 335 333 333 333 333 ...
## $ Age          : num 20 24 31 35 35 23 33 18 19 19 ...
## $ HS.GPA       : num 3.88 3.48 4 3.16 3.9 ...
## $ SATR.Converted : num 1370 1400 1400 1460 1370 1540 1190 1370 1430 1350 ...
## $ Review.OutsideActivity: num 3 3 1 3 1 2 3 2 2 3 ...
## $ Review.Leadership : num 2 1 0 0 1 2 3 0 1 3 ...
## $ Review.WorkExp    : num 2 2 0 1 0 0 0 1 0 3 ...
## $ Review.WorkEthic  : num 3 3 0 0 2 2 2 1 2 3 ...
## $ Review.ExpDiversity : num 3 2 0 1 1 1 3 1 2 2 ...
## $ Review.DesireAttend : num 2 2 0 2 1 3 3 1 3 3 ...
## $ Review.Affinity    : num 2 2 1 0 1 2 3 1 2 3 ...
## $ Review.InnovEntrep : num 1 0 0 0 0 0 1 0 1 3 ...
## $ Review.Teamwork    : num 3 2 0 1 1 2 3 3 2 3 ...
## $ Review.OverallFit  : num 7 8 7 8 8 7 5 6 8 10 ...
## $ Logins.60Days      : num 0 0 0 0 0 0 0 0 0 0 ...
## $ EventCount.All     : num 0 1 0 0 0 0 0 0 0 2 ...
## $ EventCount.Admitted : num 0 0 0 0 0 0 0 0 0 2 ...
## $ EventCount.Campus  : num 0 1 0 0 0 0 0 0 0 2 ...
```

## Create Dummies

```
dfwithDummies <- dummy.data.frame(dfDataSetKNN[2:30], sep = ".")
names(dfwithDummies)
```

```
## [1] "Sex.F"
## [2] "Sex.M"
## [3] "Expel.N"
## [4] "Expel.Y"
## [5] "First.Gen.N"
## [6] "First.Gen.Y"
## [7] "Challenge Tag.N"
## [8] "Challenge Tag.Y"
## [9] "Boettcher.Semi.N"
## [10] "Boettcher.Semi.Y"
## [11] "Boettcher.Final.N"
## [12] "Boettcher.Final.Y"
## [13] "Daniels.Semi.N"
## [14] "Daniels.Semi.Y"
## [15] "Daniels.Final.N"
## [16] "Daniels.Final.Y"
## [17] "Harvey.App.N"
## [18] "Harvey.App.Y"
## [19] "Harvey.Final.N"
```

```

## [20] "Harvey.Final.Y"
## [21] "FC.App.N"
## [22] "FC.App.Y"
## [23] "Thorson.App.N"
## [24] "Thorson.App.Y"
## [25] "Thorson.Admit.N"
## [26] "Thorson.Admit.Y"
## [27] "Summet.Participant.N"
## [28] "Summet.Participant.Y"
## [29] "Mines.Medal.N"
## [30] "Mines.Medal.Y"
## [31] "SPS.N"
## [32] "SPS.Y"
## [33] "Veteran.N"
## [34] "Veteran.Y"
## [35] "Legacy.N"
## [36] "Legacy.Y"
## [37] "Athlete.N"
## [38] "Athlete.Y"
## [39] "State.CO"
## [40] "State.Other"
## [41] "Citizenship.Foreign National/International"
## [42] "Citizenship.International"
## [43] "Citizenship.Missing"
## [44] "Citizenship.U.S. Citizen"
## [45] "Citizenship.U.S. Permanent Resident/Green Card Holder"
## [46] "Citizenship.Undocumented/DACA"
## [47] "Ethnicity.American Indian or Alaska Native"
## [48] "Ethnicity.Asian"
## [49] "Ethnicity.Black or African American"
## [50] "Ethnicity.Hispanic or Latino"
## [51] "Ethnicity.Missing"
## [52] "Ethnicity.Multiracial"
## [53] "Ethnicity.Native Hawaiian or Other Pacific Islander"
## [54] "Ethnicity.NotDeclared"
## [55] "Ethnicity.Unknown"
## [56] "Ethnicity.White"
## [57] "Major.App.Applied Mathematics & Statistics - Computational & Applied Mathematics"
## [58] "Major.App.Applied Mathematics & Statistics - Statistics"
## [59] "Major.App.Chemical Engineering"
## [60] "Major.App.Chemical Engineering - Biological Engineering Specialty"
## [61] "Major.App.Chemistry"
## [62] "Major.App.Chemistry - Biochemistry Specialty"
## [63] "Major.App.Chemistry - Environmental Chemistry Specialty"
## [64] "Major.App.Civil Engineering"
## [65] "Major.App.Computer Science"
## [66] "Major.App.Economics"
## [67] "Major.App.Electrical Engineering"
## [68] "Major.App.Engineering Physics"
## [69] "Major.App.Environmental Engineering"
## [70] "Major.App.Geological Engineering"
## [71] "Major.App.Geophysical Engineering"
## [72] "Major.App.Mechanical Engineering"
## [73] "Major.App.Metallurgical & Materials Engineering"

```

```
## [74] "Major.App.Mining Engineering"
## [75] "Major.App.Missing"
## [76] "Major.App.Petroleum Engineering"
## [77] "Major.App.Undecided"
## [78] "First Contact.ACT"
## [79] "First Contact.Application"
## [80] "First Contact.Athlete Form"
## [81] "First Contact.Campus Visit"
## [82] "First Contact.College Fair"
## [83] "First Contact.FUF"
## [84] "First Contact.Girls Lead the Way"
## [85] "First Contact.GPA Form"
## [86] "First Contact.Inquiry Form"
## [87] "First Contact.Mailing"
## [88] "First Contact.Materials"
## [89] "First Contact.MEP"
## [90] "First Contact.Phone"
## [91] "First Contact.Preview Mines"
## [92] "First Contact.Royall Search"
## [93] "First Contact.SAT"
## [94] "First Contact.TOEFL"
## [95] "First Visit.Campus Tour"
## [96] "First Visit.Campus Visit"
## [97] "First Visit.Class Shadow"
## [98] "First Visit.Discover Mines"
## [99] "First Visit.Discovery Mines in Your City"
## [100] "First Visit.Girls Lead the Way"
## [101] "First Visit.Launch"
## [102] "First Visit.Making The Connection"
## [103] "First Visit.Meet Me at Mines"
## [104] "First Visit.None"
## [105] "First Visit.Preview Mines"
## [106] "First Visit.Preview Mines In Your City"
## [107] "Sport.Men's Varsity Baseball"
## [108] "Sport.Men's Varsity Basketball"
## [109] "Sport.Men's Varsity Football"
## [110] "Sport.Men's Varsity Golf"
## [111] "Sport.Men's Varsity Soccer"
## [112] "Sport.Men's Varsity Wrestling"
## [113] "Sport.None"
## [114] "Sport.Varsity Swimming/Diving"
## [115] "Sport.Varsity Track/Field"
## [116] "Sport.Varsity XCountry"
## [117] "Sport.Women's Varsity Basketball"
## [118] "Sport.Women's Varsity Soccer"
## [119] "Sport.Women's Varsity Softball"
## [120] "Sport.Women's Varsity Volleyball"
```

```
summary(dfwithDummies)
```

##	Sex.F	Sex.M	Expel.N	Expel.Y
##	Min. :0.0000	Min. :0.0000	Min. :0.0000	Min. :0.00000
##	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:1.0000	1st Qu.:0.00000
##	Median :0.0000	Median :1.0000	Median :1.0000	Median :0.00000
##	Mean :0.3281	Mean :0.6719	Mean :0.9877	Mean :0.01235

##	3rd Qu.:1.0000	3rd Qu.:1.0000	3rd Qu.:1.0000	3rd Qu.:0.00000
##	Max. :1.0000	Max. :1.0000	Max. :1.0000	Max. :1.00000
##	First.Gen.N	First.Gen.Y	Challenge Tag.N	Challenge Tag.Y
##	Min. :0.0000	Min. :0.00000	Min. :0.0000	Min. :0.00000
##	1st Qu.:1.0000	1st Qu.:0.00000	1st Qu.:1.0000	1st Qu.:0.00000
##	Median :1.0000	Median :0.00000	Median :1.0000	Median :0.00000
##	Mean :0.9105	Mean :0.08949	Mean :0.9798	Mean :0.02021
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:1.0000	3rd Qu.:0.00000
##	Max. :1.0000	Max. :1.00000	Max. :1.0000	Max. :1.00000
##	Boettcher.Semi.N	Boettcher.Semi.Y	Boettcher.Final.N	Boettcher.Final.Y
##	Min. :0.0000	Min. :0.00000	Min. :0.000	Min. :0.00000
##	1st Qu.:1.0000	1st Qu.:0.00000	1st Qu.:1.000	1st Qu.:0.00000
##	Median :1.0000	Median :0.00000	Median :1.000	Median :0.00000
##	Mean :0.9843	Mean :0.01572	Mean :0.996	Mean :0.00401
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:1.000	3rd Qu.:0.00000
##	Max. :1.0000	Max. :1.00000	Max. :1.000	Max. :1.00000
##	Daniels.Semi.N	Daniels.Semi.Y	Daniels.Final.N	Daniels.Final.Y
##	Min. :0.0000	Min. :0.00000	Min. :0.000	Min. :0.00000
##	1st Qu.:1.0000	1st Qu.:0.00000	1st Qu.:1.000	1st Qu.:0.00000
##	Median :1.0000	Median :0.00000	Median :1.000	Median :0.00000
##	Mean :0.9883	Mean :0.01171	Mean :0.996	Mean :0.00401
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:1.000	3rd Qu.:0.00000
##	Max. :1.0000	Max. :1.00000	Max. :1.000	Max. :1.00000
##	Harvey.App.N	Harvey.App.Y	Harvey.Final.N	Harvey.Final.Y
##	Min. :0.0000	Min. :0.00000	Min. :0.0000	Min. :0.000000
##	1st Qu.:1.0000	1st Qu.:0.00000	1st Qu.:1.0000	1st Qu.:0.000000
##	Median :1.0000	Median :0.00000	Median :1.0000	Median :0.000000
##	Mean :0.9102	Mean :0.08982	Mean :0.9925	Mean :0.007538
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:1.0000	3rd Qu.:0.000000
##	Max. :1.0000	Max. :1.00000	Max. :1.0000	Max. :1.000000
##	FC.App.N	FC.App.Y	Thorson.App.N	Thorson.App.Y
##	Min. :0.000	Min. :0.00000	Min. :0.0000	Min. :0.00000
##	1st Qu.:1.000	1st Qu.:0.00000	1st Qu.:1.0000	1st Qu.:0.00000
##	Median :1.000	Median :0.00000	Median :1.0000	Median :0.00000
##	Mean :0.986	Mean :0.01395	Mean :0.9578	Mean :0.04218
##	3rd Qu.:1.000	3rd Qu.:0.00000	3rd Qu.:1.0000	3rd Qu.:0.00000
##	Max. :1.000	Max. :1.00000	Max. :1.0000	Max. :1.00000
##	Thorson.Admit.N	Thorson.Admit.Y	Summet.Participant.N	
##	Min. :0.0000	Min. :0.00000	Min. :0.0000	
##	1st Qu.:1.0000	1st Qu.:0.00000	1st Qu.:1.0000	
##	Median :1.0000	Median :0.00000	Median :1.0000	
##	Mean :0.9751	Mean :0.02486	Mean :0.9966	
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:1.0000	
##	Max. :1.0000	Max. :1.00000	Max. :1.0000	
##	Summet.Participant.Y	Mines.Medal.N	Mines.Medal.Y	
##	Min. :0.000000	Min. :0.0000	Min. :0.0000000	
##	1st Qu.:0.000000	1st Qu.:1.0000	1st Qu.:0.0000000	
##	Median :0.000000	Median :1.0000	Median :0.0000000	
##	Mean :0.003368	Mean :0.9995	Mean :0.0004812	
##	3rd Qu.:0.000000	3rd Qu.:1.0000	3rd Qu.:0.0000000	
##	Max. :1.000000	Max. :1.0000	Max. :1.0000000	
##	SPS.N	SPS.Y	Veteran.N	Veteran.Y
##	Min. :0.0000	Min. :0.000000	Min. :0.0000	Min. :0.00000
##	1st Qu.:1.0000	1st Qu.:0.000000	1st Qu.:1.0000	1st Qu.:0.00000

```

## Median :1.0000 Median :0.000000 Median :1.0000 Median :0.00000
## Mean :0.9933 Mean :0.006736 Mean :0.9315 Mean :0.06848
## 3rd Qu.:1.0000 3rd Qu.:0.000000 3rd Qu.:1.0000 3rd Qu.:0.00000
## Max. :1.0000 Max. :1.000000 Max. :1.0000 Max. :1.00000
## Legacy.N Legacy.Y Athlete.N Athlete.Y
## Min. :0.0000 Min. :0.0000 Min. :0.0000 Min. :0.00000
## 1st Qu.:1.0000 1st Qu.:0.0000 1st Qu.:1.0000 1st Qu.:0.00000
## Median :1.0000 Median :0.0000 Median :1.0000 Median :0.00000
## Mean :0.9267 Mean :0.0733 Mean :0.9739 Mean :0.02614
## 3rd Qu.:1.0000 3rd Qu.:0.0000 3rd Qu.:1.0000 3rd Qu.:0.00000
## Max. :1.0000 Max. :1.0000 Max. :1.0000 Max. :1.00000
## State.CO State.Other
## Min. :0.0000 Min. :0.0000
## 1st Qu.:0.0000 1st Qu.:0.0000
## Median :0.0000 Median :1.0000
## Mean :0.3026 Mean :0.6974
## 3rd Qu.:1.0000 3rd Qu.:1.0000
## Max. :1.0000 Max. :1.0000
## Citizenship.Foreign National/International Citizenship.International
## Min. :0.00000 Min. :0.000000
## 1st Qu.:0.00000 1st Qu.:0.000000
## Median :0.00000 Median :0.000000
## Mean :0.03368 Mean :0.001604
## 3rd Qu.:0.00000 3rd Qu.:0.000000
## Max. :1.00000 Max. :1.000000
## Citizenship.Missing Citizenship.U.S. Citizen
## Min. :0.000000 Min. :0.0000
## 1st Qu.:0.000000 1st Qu.:1.0000
## Median :0.000000 Median :1.0000
## Mean :0.001925 Mean :0.9471
## 3rd Qu.:0.000000 3rd Qu.:1.0000
## Max. :1.000000 Max. :1.0000
## Citizenship.U.S. Permanent Resident/Green Card Holder
## Min. :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean :0.01363
## 3rd Qu.:0.00000
## Max. :1.00000
## Citizenship.Undocumented/DACA Ethnicity.American Indian or Alaska Native
## Min. :0.000000 Min. :0.00000
## 1st Qu.:0.000000 1st Qu.:0.00000
## Median :0.000000 Median :0.00000
## Mean :0.002085 Mean :0.01299
## 3rd Qu.:0.000000 3rd Qu.:0.00000
## Max. :1.000000 Max. :1.00000
## Ethnicity.Asian Ethnicity.Black or African American
## Min. :0.00000 Min. :0.00000
## 1st Qu.:0.00000 1st Qu.:0.00000
## Median :0.00000 Median :0.00000
## Mean :0.09992 Mean :0.01716
## 3rd Qu.:0.00000 3rd Qu.:0.00000
## Max. :1.00000 Max. :1.00000
## Ethnicity.Hispanic or Latino Ethnicity.Missing Ethnicity.Multiracial

```

```

## Min.      :0.00000      Min.      :0.000000      Min.      :0.0000000
## 1st Qu.:0.00000      1st Qu.:0.000000      1st Qu.:0.0000000
## Median :0.00000      Median :0.000000      Median :0.0000000
## Mean    :0.05164      Mean    :0.003368      Mean    :0.0001604
## 3rd Qu.:0.00000      3rd Qu.:0.000000      3rd Qu.:0.0000000
## Max.    :1.00000      Max.    :1.000000      Max.    :1.0000000
## Ethnicity.Native Hawaiian or Other Pacific Islander Ethnicity.NotDeclared
## Min.      :0.000000      Min.      :0.00000
## 1st Qu.:0.000000      1st Qu.:0.00000
## Median :0.000000      Median :0.00000
## Mean    :0.003689      Mean    :0.04731
## 3rd Qu.:0.000000      3rd Qu.:0.00000
## Max.    :1.000000      Max.    :1.00000
## Ethnicity.Unknown Ethnicity.White
## Min.      :0.0000000      Min.      :0.0000
## 1st Qu.:0.0000000      1st Qu.:1.0000
## Median :0.0000000      Median :1.0000
## Mean    :0.0003208      Mean    :0.7634
## 3rd Qu.:0.0000000      3rd Qu.:1.0000
## Max.    :1.0000000      Max.    :1.0000
## Major.App.Applied Mathematics & Statistics - Computational & Applied Mathematics
## Min.      :0.0000
## 1st Qu.:0.0000
## Median :0.0000
## Mean    :0.0247
## 3rd Qu.:0.0000
## Max.    :1.0000
## Major.App.Applied Mathematics & Statistics - Statistics
## Min.      :0.000000
## 1st Qu.:0.000000
## Median :0.000000
## Mean    :0.007698
## 3rd Qu.:0.000000
## Max.    :1.000000
## Major.App.Chemical Engineering
## Min.      :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean    :0.08677
## 3rd Qu.:0.00000
## Max.    :1.00000
## Major.App.Chemical Engineering - Biological Engineering Specialty
## Min.      :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean    :0.08051
## 3rd Qu.:0.00000
## Max.    :1.00000
## Major.App.Chemistry Major.App.Chemistry - Biochemistry Specialty
## Min.      :0.00000      Min.      :0.0000
## 1st Qu.:0.00000      1st Qu.:0.0000
## Median :0.00000      Median :0.0000
## Mean    :0.01235      Mean    :0.0255
## 3rd Qu.:0.00000      3rd Qu.:0.0000

```



```

## Max.      :1.00000      Max.      :1.0000
## Major.App.Chemistry - Environmental Chemistry Specialty
## Min.      :0.000000
## 1st Qu.:0.000000
## Median :0.000000
## Mean     :0.003368
## 3rd Qu.:0.000000
## Max.      :1.000000
## Major.App.Civil Engineering Major.App.Computer Science
## Min.      :0.00000      Min.      :0.0000
## 1st Qu.:0.00000      1st Qu.:0.0000
## Median :0.00000      Median :0.0000
## Mean     :0.06287      Mean     :0.1007
## 3rd Qu.:0.00000      3rd Qu.:0.0000
## Max.      :1.00000      Max.      :1.0000
## Major.App.Economics Major.App.Electrical Engineering
## Min.      :0.00000      Min.      :0.00000
## 1st Qu.:0.00000      1st Qu.:0.00000
## Median :0.00000      Median :0.00000
## Mean     :0.01299      Mean     :0.06977
## 3rd Qu.:0.00000      3rd Qu.:0.00000
## Max.      :1.00000      Max.      :1.00000
## Major.App.Engineering Physics Major.App.Environmental Engineering
## Min.      :0.00000      Min.      :0.00000
## 1st Qu.:0.00000      1st Qu.:0.00000
## Median :0.00000      Median :0.00000
## Mean     :0.04683      Mean     :0.05437
## 3rd Qu.:0.00000      3rd Qu.:0.00000
## Max.      :1.00000      Max.      :1.00000
## Major.App.Geological Engineering Major.App.Geophysical Engineering
## Min.      :0.0000      Min.      :0.000000
## 1st Qu.:0.0000      1st Qu.:0.000000
## Median :0.0000      Median :0.000000
## Mean     :0.0162      Mean     :0.005453
## 3rd Qu.:0.0000      3rd Qu.:0.000000
## Max.      :1.0000      Max.      :1.000000
## Major.App.Mechanical Engineering
## Min.      :0.0000
## 1st Qu.:0.0000
## Median :0.0000
## Mean     :0.2388
## 3rd Qu.:0.0000
## Max.      :1.0000
## Major.App.Metallurgical & Materials Engineering
## Min.      :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean     :0.01973
## 3rd Qu.:0.00000
## Max.      :1.00000
## Major.App.Mining Engineering Major.App.Missing
## Min.      :0.000000      Min.      :0.000000
## 1st Qu.:0.000000      1st Qu.:0.000000
## Median :0.000000      Median :0.000000

```

```

## Mean :0.009784          Mean :0.003208
## 3rd Qu.:0.000000        3rd Qu.:0.000000
## Max. :1.000000          Max. :1.000000
## Major.App.Petroleum Engineering Major.App.Undecided First Contact.ACT
## Min. :0.00000          Min. :0.00000          Min. :0.00000
## 1st Qu.:0.00000        1st Qu.:0.00000        1st Qu.:0.00000
## Median :0.00000        Median :0.00000        Median :0.00000
## Mean :0.03801          Mean :0.08035          Mean :0.09447
## 3rd Qu.:0.00000        3rd Qu.:0.00000        3rd Qu.:0.00000
## Max. :1.00000          Max. :1.00000          Max. :1.00000
## First Contact.Application First Contact.Athlete Form
## Min. :0.0000          Min. :0.000000
## 1st Qu.:0.0000        1st Qu.:0.000000
## Median :0.0000        Median :0.000000
## Mean :0.1524          Mean :0.006897
## 3rd Qu.:0.0000        3rd Qu.:0.000000
## Max. :1.0000          Max. :1.000000
## First Contact.Campus Visit First Contact.College Fair First Contact.FUF
## Min. :0.0000          Min. :0.000000          Min. :0.0000
## 1st Qu.:0.0000        1st Qu.:0.000000          1st Qu.:0.0000
## Median :0.0000        Median :0.000000          Median :0.0000
## Mean :0.1254          Mean :0.003368          Mean :0.1545
## 3rd Qu.:0.0000        3rd Qu.:0.000000          3rd Qu.:0.0000
## Max. :1.0000          Max. :1.000000          Max. :1.0000
## First Contact.Girls Lead the Way First Contact.GPA Form
## Min. :0.000000        Min. :0.000000
## 1st Qu.:0.000000        1st Qu.:0.000000
## Median :0.000000        Median :0.000000
## Mean :0.001443          Mean :0.003368
## 3rd Qu.:0.000000        3rd Qu.:0.000000
## Max. :1.000000        Max. :1.000000
## First Contact.Inquiry Form First Contact.Mailing First Contact.Materials
## Min. :0.00000          Min. :0.000000          Min. :0.000000
## 1st Qu.:0.00000        1st Qu.:0.000000          1st Qu.:0.000000
## Median :0.00000        Median :0.000000          Median :0.000000
## Mean :0.01588          Mean :0.0004812          Mean :0.003368
## 3rd Qu.:0.00000        3rd Qu.:0.000000          3rd Qu.:0.000000
## Max. :1.00000          Max. :1.000000          Max. :1.000000
## First Contact.MEP First Contact.Phone First Contact.Preview Mines
## Min. :0.000000        Min. :0.000000          Min. :0.00000
## 1st Qu.:0.000000        1st Qu.:0.000000          1st Qu.:0.00000
## Median :0.000000        Median :0.000000          Median :0.00000
## Mean :0.002727          Mean :0.0001604          Mean :0.01395
## 3rd Qu.:0.000000        3rd Qu.:0.000000          3rd Qu.:0.00000
## Max. :1.000000        Max. :1.000000          Max. :1.00000
## First Contact.Royall Search First Contact.SAT First Contact.TOEFL
## Min. :0.0000          Min. :0.00000          Min. :0.0000000
## 1st Qu.:0.0000        1st Qu.:0.00000          1st Qu.:0.0000000
## Median :0.0000        Median :0.00000          Median :0.0000000
## Mean :0.3973          Mean :0.02422          Mean :0.0001604
## 3rd Qu.:1.0000        3rd Qu.:0.00000          3rd Qu.:0.0000000
## Max. :1.0000          Max. :1.00000          Max. :1.0000000
## First Visit.Campus Tour First Visit.Campus Visit First Visit.Class Shadow
## Min. :0.00000          Min. :0.0000          Min. :0.000000

```

## 1st Qu.:0.00000	1st Qu.:0.0000	1st Qu.:0.000000
## Median :0.00000	Median :0.0000	Median :0.000000
## Mean :0.08613	Mean :0.1511	Mean :0.004972
## 3rd Qu.:0.00000	3rd Qu.:0.0000	3rd Qu.:0.000000
## Max. :1.00000	Max. :1.0000	Max. :1.000000
## First Visit.Discover Mines First Visit.Discovery Mines in Your City		
## Min. :0.00000	Min. :0.000000	
## 1st Qu.:0.00000	1st Qu.:0.000000	
## Median :0.00000	Median :0.000000	
## Mean :0.03352	Mean :0.005453	
## 3rd Qu.:0.00000	3rd Qu.:0.000000	
## Max. :1.00000	Max. :1.000000	
## First Visit.Girls Lead the Way First Visit.Launch		
## Min. :0.000000	Min. :0.00000	
## 1st Qu.:0.000000	1st Qu.:0.00000	
## Median :0.000000	Median :0.00000	
## Mean :0.003528	Mean :0.03176	
## 3rd Qu.:0.000000	3rd Qu.:0.00000	
## Max. :1.000000	Max. :1.00000	
## First Visit.Making The Connection First Visit.Meet Me at Mines		
## Min. :0.0000	Min. :0.000000	
## 1st Qu.:0.0000	1st Qu.:0.000000	
## Median :0.0000	Median :0.000000	
## Mean :0.0154	Mean :0.005293	
## 3rd Qu.:0.0000	3rd Qu.:0.000000	
## Max. :1.0000	Max. :1.000000	
## First Visit.None First Visit.Preview Mines		
## Min. :0.0000	Min. :0.00000	
## 1st Qu.:0.0000	1st Qu.:0.00000	
## Median :1.0000	Median :0.00000	
## Mean :0.5931	Mean :0.03111	
## 3rd Qu.:1.0000	3rd Qu.:0.00000	
## Max. :1.0000	Max. :1.00000	
## First Visit.Preview Mines In Your City Sport.Men's Varsity Baseball		
## Min. :0.00000	Min. :0.0000000	
## 1st Qu.:0.00000	1st Qu.:0.0000000	
## Median :0.00000	Median :0.0000000	
## Mean :0.03865	Mean :0.0009623	
## 3rd Qu.:0.00000	3rd Qu.:0.0000000	
## Max. :1.00000	Max. :1.0000000	
## Sport.Men's Varsity Basketball Sport.Men's Varsity Football		
## Min. :0.000000	Min. :0.00000	
## 1st Qu.:0.000000	1st Qu.:0.00000	
## Median :0.000000	Median :0.00000	
## Mean :0.001443	Mean :0.01363	
## 3rd Qu.:0.000000	3rd Qu.:0.00000	
## Max. :1.000000	Max. :1.00000	
## Sport.Men's Varsity Golf Sport.Men's Varsity Soccer		
## Min. :0.0000000	Min. :0.0000000	
## 1st Qu.:0.0000000	1st Qu.:0.0000000	
## Median :0.0000000	Median :0.0000000	
## Mean :0.0004812	Mean :0.0009623	
## 3rd Qu.:0.0000000	3rd Qu.:0.0000000	
## Max. :1.0000000	Max. :1.0000000	

```
## Sport.Men's Varsity Wrestling Sport.None
## Min. :0.000000 Min. :0.0000
## 1st Qu.:0.000000 1st Qu.:1.0000
## Median :0.000000 Median :1.0000
## Mean :0.002406 Mean :0.9739
## 3rd Qu.:0.000000 3rd Qu.:1.0000
## Max. :1.000000 Max. :1.0000
## Sport.Varsity Swimming/Diving Sport.Varsity Track/Field
## Min. :0.0000000 Min. :0.000000
## 1st Qu.:0.0000000 1st Qu.:0.000000
## Median :0.0000000 Median :0.000000
## Mean :0.0001604 Mean :0.002406
## 3rd Qu.:0.0000000 3rd Qu.:0.000000
## Max. :1.0000000 Max. :1.000000
## Sport.Varsity XCountry Sport.Women's Varsity Basketball
## Min. :0.0000000 Min. :0.000000
## 1st Qu.:0.0000000 1st Qu.:0.000000
## Median :0.0000000 Median :0.000000
## Mean :0.0006415 Mean :0.001123
## 3rd Qu.:0.0000000 3rd Qu.:0.000000
## Max. :1.0000000 Max. :1.000000
## Sport.Women's Varsity Soccer Sport.Women's Varsity Softball
## Min. :0.0000000 Min. :0.000000
## 1st Qu.:0.0000000 1st Qu.:0.000000
## Median :0.0000000 Median :0.000000
## Mean :0.0006415 Mean :0.0004812
## 3rd Qu.:0.0000000 3rd Qu.:0.000000
## Max. :1.0000000 Max. :1.000000
## Sport.Women's Varsity Volleyball
## Min. :0.0000000
## 1st Qu.:0.0000000
## Median :0.0000000
## Mean :0.0008019
## 3rd Qu.:0.0000000
## Max. :1.0000000
```

```
str(dfwithDummies)
```

```
## 'data.frame': 6235 obs. of 120 variables:
```

```
## $ Sex.F : int 0 0 0 0 0 0
## $ Sex.M : int 1 1 1 1 1 1
## $ Expel.N : int 1 1 1 1 1 1
## $ Expel.Y : int 0 0 0 0 0 0
## $ First.Gen.N : int 1 1 1 1 1 1
## $ First.Gen.Y : int 0 0 0 0 0 0
## $ Challenge Tag.N : int 1 1 1 1 1 1
## $ Challenge Tag.Y : int 0 0 0 0 0 0
## $ Boettcher.Semi.N : int 1 1 1 1 1 1
## $ Boettcher.Semi.Y : int 0 0 0 0 0 0
## $ Boettcher.Final.N : int 1 1 1 1 1 1
## $ Boettcher.Final.Y : int 0 0 0 0 0 0
## $ Daniels.Semi.N : int 1 1 1 1 1 1
## $ Daniels.Semi.Y : int 0 0 0 0 0 0
## $ Daniels.Final.N : int 1 1 1 1 1 1
## $ Daniels.Final.Y : int 0 0 0 0 0 0
```

## \$ Harvey.App.N	: int	1	1	1	1	1	1	1
## \$ Harvey.App.Y	: int	0	0	0	0	0	0	0
## \$ Harvey.Final.N	: int	1	1	1	1	1	1	1
## \$ Harvey.Final.Y	: int	0	0	0	0	0	0	0
## \$ FC.App.N	: int	1	1	1	1	1	1	1
## \$ FC.App.Y	: int	0	0	0	0	0	0	0
## \$ Thorson.App.N	: int	1	1	1	1	1	1	1
## \$ Thorson.App.Y	: int	0	0	0	0	0	0	0
## \$ Thorson.Admit.N	: int	1	1	1	1	1	1	1
## \$ Thorson.Admit.Y	: int	0	0	0	0	0	0	0
## \$ Summet.Participant.N	: int	1	1	1	1	1	1	1
## \$ Summet.Participant.Y	: int	0	0	0	0	0	0	0
## \$ Mines.Medal.N	: int	1	1	1	1	1	1	1
## \$ Mines.Medal.Y	: int	0	0	0	0	0	0	0
## \$ SPS.N	: int	1	1	1	1	1	1	1
## \$ SPS.Y	: int	0	0	0	0	0	0	0
## \$ Veteran.N	: int	1	1	1	1	1	1	1
## \$ Veteran.Y	: int	0	0	0	0	0	0	0
## \$ Legacy.N	: int	1	1	1	1	1	1	1
## \$ Legacy.Y	: int	0	0	0	0	0	0	0
## \$ Athlete.N	: int	1	1	1	1	1	1	1
## \$ Athlete.Y	: int	0	0	0	0	0	0	0
## \$ State.CO	: int	1	0	0	1	0	1	0
## \$ State.Other	: int	0	1	1	0	1	0	1
## \$ Citizenship.Foreign National/International	: int	0	0	0	0	0	0	0
## \$ Citizenship.International	: int	0	0	0	0	0	0	0
## \$ Citizenship.Missing	: int	0	0	0	0	0	0	0
## \$ Citizenship.U.S. Citizen	: int	1	1	1	1	1	1	1
## \$ Citizenship.U.S. Permanent Resident/Green Card Holder	: int	0	0	0	0	0	0	0
## \$ Citizenship.Undocumented/DACA	: int	0	0	0	0	0	0	0
## \$ Ethnicity.American Indian or Alaska Native	: int	0	0	0	0	0	0	0
## \$ Ethnicity.Asian	: int	1	0	0	0	0	0	0
## \$ Ethnicity.Black or African American	: int	0	0	0	0	1	0	0
## \$ Ethnicity.Hispanic or Latino	: int	0	0	0	0	0	0	0
## \$ Ethnicity.Missing	: int	0	0	0	0	0	0	0
## \$ Ethnicity.Multiracial	: int	0	0	0	0	0	0	0
## \$ Ethnicity.Native Hawaiian or Other Pacific Islander	: int	0	0	0	0	0	0	0
## \$ Ethnicity.NotDeclared	: int	0	0	0	0	0	0	0
## \$ Ethnicity.Unknown	: int	0	0	0	0	0	0	0
## \$ Ethnicity.White	: int	0	1	1	1	0	0	0
## \$ Major.App.Applied Mathematics & Statistics - Computational & Applied Mathematics	: int	0	0	0	0	0	0	0
## \$ Major.App.Applied Mathematics & Statistics - Statistics	: int	0	0	0	0	0	0	0
## \$ Major.App.Chemical Engineering	: int	0	0	0	0	0	0	0
## \$ Major.App.Chemical Engineering - Biological Engineering Specialty	: int	0	0	0	0	0	0	0
## \$ Major.App.Chemistry	: int	0	0	0	0	0	0	0
## \$ Major.App.Chemistry - Biochemistry Specialty	: int	0	0	0	0	0	0	0
## \$ Major.App.Chemistry - Environmental Chemistry Specialty	: int	0	0	0	0	0	0	0
## \$ Major.App.Civil Engineering	: int	1	0	0	0	0	0	0
## \$ Major.App.Computer Science	: int	0	0	0	0	0	0	0
## \$ Major.App.Economics	: int	0	0	0	0	0	0	0
## \$ Major.App.Electrical Engineering	: int	0	0	0	0	0	0	0
## \$ Major.App.Engineering Physics	: int	0	0	0	0	0	0	0
## \$ Major.App.Environmental Engineering	: int	0	0	0	0	0	0	0
## \$ Major.App.Geological Engineering	: int	0	0	0	0	0	0	0

```

## $ Major.App.Geophysical Engineering : int 0 0 0 0 0 0
## $ Major.App.Mechanical Engineering : int 0 1 1 1 1 0
## $ Major.App.Metallurgical & Materials Engineering : int 0 0 0 0 0 0
## $ Major.App.Mining Engineering : int 0 0 0 0 0 0
## $ Major.App.Missing : int 0 0 0 0 0 0
## $ Major.App.Petroleum Engineering : int 0 0 0 0 0 0
## $ Major.App.Undecided : int 0 0 0 0 0 0
## $ First Contact.ACT : int 1 1 0 0 0 0
## $ First Contact.Application : int 0 0 0 0 0 0
## $ First Contact.Athlete Form : int 0 0 0 0 0 0
## $ First Contact.Campus Visit : int 0 0 0 1 0 0
## $ First Contact.College Fair : int 0 0 0 0 0 0
## $ First Contact.FUF : int 0 0 0 0 0 0
## $ First Contact.Girls Lead the Way : int 0 0 0 0 0 0
## $ First Contact.GPA Form : int 0 0 1 0 0 0
## $ First Contact.Inquiry Form : int 0 0 0 0 0 0
## $ First Contact.Mailing : int 0 0 0 0 0 0
## $ First Contact.Materials : int 0 0 0 0 0 0
## $ First Contact.MEP : int 0 0 0 0 0 0
## $ First Contact.Phone : int 0 0 0 0 0 0
## $ First Contact.Preview Mines : int 0 0 0 0 0 0
## $ First Contact.Royall Search : int 0 0 0 0 1 0
## $ First Contact.SAT : int 0 0 0 0 0 0
## $ First Contact.TOEFL : int 0 0 0 0 0 0
## $ First Visit.Campus Tour : int 0 1 0 0 0 0
## $ First Visit.Campus Visit : int 0 0 0 1 0 0
## $ First Visit.Class Shadow : int 0 0 0 0 0 0
## $ First Visit.Discover Mines : int 0 0 0 0 0 0
## $ First Visit.Discovery Mines in Your City : int 0 0 0 0 0 0
## [list output truncated]
## - attr(*, "dummies")=List of 26
## ..$ Sex : int 1 2
## ..$ Expel : int 3 4
## ..$ First.Gen : int 5 6
## ..$ Challenge Tag : int 7 8
## ..$ Boettcher.Semi : int 9 10
## ..$ Boettcher.Final : int 11 12
## ..$ Daniels.Semi : int 13 14
## ..$ Daniels.Final : int 15 16
## ..$ Harvey.App : int 17 18
## ..$ Harvey.Final : int 19 20
## ..$ FC.App : int 21 22
## ..$ Thorson.App : int 23 24
## ..$ Thorson.Admit : int 25 26
## ..$ Summet.Participant: int 27 28
## ..$ Mines.Medal : int 29 30
## ..$ SPS : int 31 32
## ..$ Veteran : int 33 34
## ..$ Legacy : int 35 36
## ..$ Athlete : int 37 38
## ..$ State : int 39 40
## ..$ Citizenship : int 41 42 43 44 45 46
## ..$ Ethnicity : int 47 48 49 50 51 52 53 54 55 56
## ..$ Major.App : int 57 58 59 60 61 62 63 64 65 66 ...

```

```
## ..$ First Contact      : int  78 79 80 81 82 83 84 85 86 87 ...
## ..$ First Visit       : int  95 96 97 98 99 100 101 102 103 104 ...
## ..$ Sport             : int 107 108 109 110 111 112 113 114 115 116 ...
```

```
dfJustNum <- dfDataSetKNN[31:48]
str(dfJustNum)
```

```
## 'data.frame':  6235 obs. of  18 variables:
## $ App.Created.Days      : num  339 339 339 339 335 335 333 333 333 333 ...
## $ Age                  : num   20 24 31 35 35 23 33 18 19 19 ...
## $ HS.GPA                : num   3.88 3.48 4 3.16 3.9 ...
## $ SATR.Converted       : num 1370 1400 1400 1460 1370 1540 1190 1370 1430 1350 ...
## $ Review.OutsideActivity: num   3 3 1 3 1 2 3 2 2 3 ...
## $ Review.Leadership     : num   2 1 0 0 1 2 3 0 1 3 ...
## $ Review.WorkExp        : num   2 2 0 1 0 0 0 1 0 3 ...
## $ Review.WorkEthic      : num   3 3 0 0 2 2 2 1 2 3 ...
## $ Review.ExpDiversity   : num   3 2 0 1 1 1 3 1 2 2 ...
## $ Review.DesireAttend   : num   2 2 0 2 1 3 3 1 3 3 ...
## $ Review.Affinity       : num   2 2 1 0 1 2 3 1 2 3 ...
## $ Review.InnovEntrep    : num   1 0 0 0 0 0 1 0 1 3 ...
## $ Review.Teamwork       : num   3 2 0 1 1 2 3 3 2 3 ...
## $ Review.OverallFit     : num   7 8 7 8 8 7 5 6 8 10 ...
## $ Logins.60Days         : num   0 0 0 0 0 0 0 0 0 0 ...
## $ EventCount.All        : num   0 1 0 0 0 0 0 0 0 2 ...
## $ EventCount.Admitted   : num   0 0 0 0 0 0 0 0 0 2 ...
## $ EventCount.Campus     : num   0 1 0 0 0 0 0 0 0 2 ...
```

```
dfNumAndDummies <- cbind(dfwithDummies, dfJustNum)
str(dfNumAndDummies)
```

```
## 'data.frame':  6235 obs. of  138 variables:
## $ Sex.F                : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Sex.M                : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Expel.N              : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Expel.Y              : int  0 0 0 0 0 0 0 0 0 0 ...
## $ First.Gen.N          : int  1 1 1 1 1 1 1 1 1 1 ...
## $ First.Gen.Y          : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Challenge.Tag.N      : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Challenge.Tag.Y      : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Boettcher.Semi.N     : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Semi.Y     : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Boettcher.Final.N    : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Boettcher.Final.Y    : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Daniels.Semi.N       : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Semi.Y       : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Daniels.Final.N      : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Daniels.Final.Y      : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Harvey.App.N         : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.App.Y         : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Harvey.Final.N       : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Harvey.Final.Y       : int  0 0 0 0 0 0 0 0 0 0 ...
## $ FC.App.N             : int  1 1 1 1 1 1 1 1 1 1 ...
## $ FC.App.Y             : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Thorson.App.N        : int  1 1 1 1 1 1 1 1 1 1 ...
## $ Thorson.App.Y        : int  0 0 0 0 0 0 0 0 0 0 ...
## $ Thorson.Admit.N      : int  1 1 1 1 1 1 1 1 1 1 ...
```

## \$ Thorson.Admit.Y	: int	0	0	0	0	0	0
## \$ Summet.Participant.N	: int	1	1	1	1	1	1
## \$ Summet.Participant.Y	: int	0	0	0	0	0	0
## \$ Mines.Medal.N	: int	1	1	1	1	1	1
## \$ Mines.Medal.Y	: int	0	0	0	0	0	0
## \$ SPS.N	: int	1	1	1	1	1	1
## \$ SPS.Y	: int	0	0	0	0	0	0
## \$ Veteran.N	: int	1	1	1	1	1	1
## \$ Veteran.Y	: int	0	0	0	0	0	0
## \$ Legacy.N	: int	1	1	1	1	1	1
## \$ Legacy.Y	: int	0	0	0	0	0	0
## \$ Athlete.N	: int	1	1	1	1	1	1
## \$ Athlete.Y	: int	0	0	0	0	0	0
## \$ State.CO	: int	1	0	0	1	0	1
## \$ State.Other	: int	0	1	1	0	1	0
## \$ Citizenship.Foreign National/International	: int	0	0	0	0	0	0
## \$ Citizenship.International	: int	0	0	0	0	0	0
## \$ Citizenship.Missing	: int	0	0	0	0	0	0
## \$ Citizenship.U.S. Citizen	: int	1	1	1	1	1	1
## \$ Citizenship.U.S. Permanent Resident/Green Card Holder	: int	0	0	0	0	0	0
## \$ Citizenship.Undocumented/DACA	: int	0	0	0	0	0	0
## \$ Ethnicity.American Indian or Alaska Native	: int	0	0	0	0	0	0
## \$ Ethnicity.Asian	: int	1	0	0	0	0	0
## \$ Ethnicity.Black or African American	: int	0	0	0	0	1	0
## \$ Ethnicity.Hispanic or Latino	: int	0	0	0	0	0	0
## \$ Ethnicity.Missing	: int	0	0	0	0	0	0
## \$ Ethnicity.Multiracial	: int	0	0	0	0	0	0
## \$ Ethnicity.Native Hawaiian or Other Pacific Islander	: int	0	0	0	0	0	0
## \$ Ethnicity.NotDeclared	: int	0	0	0	0	0	0
## \$ Ethnicity.Unknown	: int	0	0	0	0	0	0
## \$ Ethnicity.White	: int	0	1	1	1	0	1
## \$ Major.App.Applied Mathematics & Statistics - Computational & Applied Mathematics	: int	0	0	0	0	0	0
## \$ Major.App.Applied Mathematics & Statistics - Statistics	: int	0	0	0	0	0	0
## \$ Major.App.Chemical Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Chemical Engineering - Biological Engineering Specialty	: int	0	0	0	0	0	0
## \$ Major.App.Chemistry	: int	0	0	0	0	0	0
## \$ Major.App.Chemistry - Biochemistry Specialty	: int	0	0	0	0	0	0
## \$ Major.App.Chemistry - Environmental Chemistry Specialty	: int	0	0	0	0	0	0
## \$ Major.App.Civil Engineering	: int	1	0	0	0	0	0
## \$ Major.App.Computer Science	: int	0	0	0	0	0	0
## \$ Major.App.Economics	: int	0	0	0	0	0	0
## \$ Major.App.Electrical Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Engineering Physics	: int	0	0	0	0	0	0
## \$ Major.App.Environmental Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Geological Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Geophysical Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Mechanical Engineering	: int	0	1	1	1	1	0
## \$ Major.App.Metallurgical & Materials Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Mining Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Missing	: int	0	0	0	0	0	0
## \$ Major.App.Petroleum Engineering	: int	0	0	0	0	0	0
## \$ Major.App.Undecided	: int	0	0	0	0	0	0
## \$ First Contact.ACT	: int	1	1	0	0	0	0
## \$ First Contact.Application	: int	0	0	0	0	0	0



```
## $ First Contact.Athlete Form : int 0 0 0 0 0 0
## $ First Contact.Campus Visit : int 0 0 0 1 0 1
## $ First Contact.College Fair : int 0 0 0 0 0 0
## $ First Contact.FUF : int 0 0 0 0 0 0
## $ First Contact.Girls Lead the Way : int 0 0 0 0 0 0
## $ First Contact.GPA Form : int 0 0 1 0 0 1
## $ First Contact.Inquiry Form : int 0 0 0 0 0 0
## $ First Contact.Mailing : int 0 0 0 0 0 0
## $ First Contact.Materials : int 0 0 0 0 0 0
## $ First Contact.MEP : int 0 0 0 0 0 0
## $ First Contact.Phone : int 0 0 0 0 0 0
## $ First Contact.Preview Mines : int 0 0 0 0 0 0
## $ First Contact.Royall Search : int 0 0 0 0 1 0
## $ First Contact.SAT : int 0 0 0 0 0 0
## $ First Contact.TOEFL : int 0 0 0 0 0 0
## $ First Visit.Campus Tour : int 0 1 0 0 0 0
## $ First Visit.Campus Visit : int 0 0 0 1 0 1
## $ First Visit.Class Shadow : int 0 0 0 0 0 0
## $ First Visit.Discover Mines : int 0 0 0 0 0 0
## $ First Visit.Discovery Mines in Your City : int 0 0 0 0 0 0
## [list output truncated]
```

## Normalize Function

```
normalize <- function(x) {
  return ((x - min(x)) / (max(x) - min(x)))
}

dfNormData <- as.data.frame(lapply(dfNumAndDummies, normalize))
str(dfNormData)
```

```
## 'data.frame': 6235 obs. of 138 variables:
## $ Sex.F : num 0 0 0 0 0 0
## $ Sex.M : num 1 1 1 1 1 1
## $ Expel.N : num 1 1 1 1 1 1
## $ Expel.Y : num 0 0 0 0 0 0
## $ First.Gen.N : num 1 1 1 1 1 1
## $ First.Gen.Y : num 0 0 0 0 0 0
## $ Challenge.Tag.N : num 1 1 1 1 1 1
## $ Challenge.Tag.Y : num 0 0 0 0 0 0
## $ Boettcher.Semi.N : num 1 1 1 1 1 1
## $ Boettcher.Semi.Y : num 0 0 0 0 0 0
## $ Boettcher.Final.N : num 1 1 1 1 1 1
## $ Boettcher.Final.Y : num 0 0 0 0 0 0
## $ Daniels.Semi.N : num 1 1 1 1 1 1
## $ Daniels.Semi.Y : num 0 0 0 0 0 0
## $ Daniels.Final.N : num 1 1 1 1 1 1
## $ Daniels.Final.Y : num 0 0 0 0 0 0
## $ Harvey.App.N : num 1 1 1 1 1 1
## $ Harvey.App.Y : num 0 0 0 0 0 0
## $ Harvey.Final.N : num 1 1 1 1 1 1
## $ Harvey.Final.Y : num 0 0 0 0 0 0
## $ FC.App.N : num 1 1 1 1 1 1
```

## \$ FC.App.Y	: num	0	0	0	0	0	0
## \$ Thorson.App.N	: num	1	1	1	1	1	1
## \$ Thorson.App.Y	: num	0	0	0	0	0	0
## \$ Thorson.Admit.N	: num	1	1	1	1	1	1
## \$ Thorson.Admit.Y	: num	0	0	0	0	0	0
## \$ Summet.Participant.N	: num	1	1	1	1	1	1
## \$ Summet.Participant.Y	: num	0	0	0	0	0	0
## \$ Mines.Medal.N	: num	1	1	1	1	1	1
## \$ Mines.Medal.Y	: num	0	0	0	0	0	0
## \$ SPS.N	: num	1	1	1	1	1	1
## \$ SPS.Y	: num	0	0	0	0	0	0
## \$ Veteran.N	: num	1	1	1	1	1	1
## \$ Veteran.Y	: num	0	0	0	0	0	0
## \$ Legacy.N	: num	1	1	1	1	1	1
## \$ Legacy.Y	: num	0	0	0	0	0	0
## \$ Athlete.N	: num	1	1	1	1	1	1
## \$ Athlete.Y	: num	0	0	0	0	0	0
## \$ State.CO	: num	1	0	0	1	0	1
## \$ State.Other	: num	0	1	1	0	1	0
## \$ Citizenship.Foreign.National.International	: num	0	0	0	0	0	0
## \$ Citizenship.International	: num	0	0	0	0	0	0
## \$ Citizenship.Missing	: num	0	0	0	0	0	0
## \$ Citizenship.U.S..Citizen	: num	1	1	1	1	1	1
## \$ Citizenship.U.S..Permanent.Resident.Green.Card.Holder	: num	0	0	0	0	0	0
## \$ Citizenship.Undocumented.DACA	: num	0	0	0	0	0	0
## \$ Ethnicity.American.Indian.or.Alaska.Native	: num	0	0	0	0	0	0
## \$ Ethnicity.Asian	: num	1	0	0	0	0	0
## \$ Ethnicity.Black.or.African.American	: num	0	0	0	0	1	0
## \$ Ethnicity.Hispanic.or.Latino	: num	0	0	0	0	0	0
## \$ Ethnicity.Missing	: num	0	0	0	0	0	0
## \$ Ethnicity.Multiracial	: num	0	0	0	0	0	0
## \$ Ethnicity.Native.Hawaiian.or.Other.Pacific.Islander	: num	0	0	0	0	0	0
## \$ Ethnicity.NotDeclared	: num	0	0	0	0	0	0
## \$ Ethnicity.Unknown	: num	0	0	0	0	0	0
## \$ Ethnicity.White	: num	0	1	1	1	0	1
## \$ Major.App.Applied.Mathematics...Statistics...Computational...Applied.Mathematics	: num	0	0	0	0	0	0
## \$ Major.App.Applied.Mathematics...Statistics...Statistics	: num	0	0	0	0	0	0
## \$ Major.App.Chemical.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Chemical.Engineering...Biological.Engineering.Specialty	: num	0	0	0	0	0	0
## \$ Major.App.Chemistry	: num	0	0	0	0	0	0
## \$ Major.App.Chemistry...Biochemistry.Specialty	: num	0	0	0	0	0	0
## \$ Major.App.Chemistry...Environmental.Chemistry.Specialty	: num	0	0	0	0	0	0
## \$ Major.App.Civil.Engineering	: num	1	0	0	0	0	0
## \$ Major.App.Computer.Science	: num	0	0	0	0	0	0
## \$ Major.App.Economics	: num	0	0	0	0	0	0
## \$ Major.App.Electrical.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Engineering.Physics	: num	0	0	0	0	0	0
## \$ Major.App.Environmental.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Geological.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Geophysical.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Mechanical.Engineering	: num	0	1	1	1	1	0
## \$ Major.App.Metallurgical...Materials.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Mining.Engineering	: num	0	0	0	0	0	0
## \$ Major.App.Missing	: num	0	0	0	0	0	0

```
## $ Major.App.Petroleum.Engineering : num 0 0 0 0 0
## $ Major.App.Undecided : num 0 0 0 0 0
## $ First.Contact.ACT : num 1 1 0 0 0
## $ First.Contact.Application : num 0 0 0 0 0
## $ First.Contact.Athlete.Form : num 0 0 0 0 0
## $ First.Contact.Campus.Visit : num 0 0 0 1 0
## $ First.Contact.College.Fair : num 0 0 0 0 0
## $ First.Contact.FUF : num 0 0 0 0 0
## $ First.Contact.Girls.Lead.the.Way : num 0 0 0 0 0
## $ First.Contact.GPA.Form : num 0 0 1 0 0
## $ First.Contact.Inquiry.Form : num 0 0 0 0 0
## $ First.Contact.Mailing : num 0 0 0 0 0
## $ First.Contact.Materials : num 0 0 0 0 0
## $ First.Contact.MEP : num 0 0 0 0 0
## $ First.Contact.Phone : num 0 0 0 0 0
## $ First.Contact.Preview.Mines : num 0 0 0 0 0
## $ First.Contact.Royall.Search : num 0 0 0 0 1
## $ First.Contact.SAT : num 0 0 0 0 0
## $ First.Contact.TOEFL : num 0 0 0 0 0
## $ First.Visit.Campus.Tour : num 0 1 0 0 0
## $ First.Visit.Campus.Visit : num 0 0 0 1 0
## $ First.Visit.Class.Shadow : num 0 0 0 0 0
## $ First.Visit.Discover.Mines : num 0 0 0 0 0
## $ First.Visit.Discovery.Mines.in.Your.City : num 0 0 0 0 0
## [list output truncated]
```

```
summary(dfNormData)
```

```
##      Sex.F      Sex.M      Expel.N      Expel.Y
## Min.   :0.0000  Min.   :0.0000  Min.   :0.0000  Min.   :0.00000
## 1st Qu.:0.0000  1st Qu.:0.0000  1st Qu.:1.0000  1st Qu.:0.00000
## Median :0.0000  Median :1.0000  Median :1.0000  Median :0.00000
## Mean   :0.3281  Mean   :0.6719  Mean   :0.9877  Mean   :0.01235
## 3rd Qu.:1.0000  3rd Qu.:1.0000  3rd Qu.:1.0000  3rd Qu.:0.00000
## Max.   :1.0000  Max.   :1.0000  Max.   :1.0000  Max.   :1.00000
##      First.Gen.N      First.Gen.Y      Challenge.Tag.N      Challenge.Tag.Y
## Min.   :0.0000  Min.   :0.00000  Min.   :0.0000  Min.   :0.00000
## 1st Qu.:1.0000  1st Qu.:0.00000  1st Qu.:1.0000  1st Qu.:0.00000
## Median :1.0000  Median :0.00000  Median :1.0000  Median :0.00000
## Mean   :0.9105  Mean   :0.08949  Mean   :0.9798  Mean   :0.02021
## 3rd Qu.:1.0000  3rd Qu.:0.00000  3rd Qu.:1.0000  3rd Qu.:0.00000
## Max.   :1.0000  Max.   :1.00000  Max.   :1.0000  Max.   :1.00000
##      Boettcher.Semi.N      Boettcher.Semi.Y      Boettcher.Final.N      Boettcher.Final.Y
## Min.   :0.0000  Min.   :0.00000  Min.   :0.000  Min.   :0.00000
## 1st Qu.:1.0000  1st Qu.:0.00000  1st Qu.:1.000  1st Qu.:0.00000
## Median :1.0000  Median :0.00000  Median :1.000  Median :0.00000
## Mean   :0.9843  Mean   :0.01572  Mean   :0.996  Mean   :0.00401
## 3rd Qu.:1.0000  3rd Qu.:0.00000  3rd Qu.:1.000  3rd Qu.:0.00000
## Max.   :1.0000  Max.   :1.00000  Max.   :1.000  Max.   :1.00000
##      Daniels.Semi.N      Daniels.Semi.Y      Daniels.Final.N      Daniels.Final.Y
## Min.   :0.0000  Min.   :0.00000  Min.   :0.000  Min.   :0.00000
## 1st Qu.:1.0000  1st Qu.:0.00000  1st Qu.:1.000  1st Qu.:0.00000
## Median :1.0000  Median :0.00000  Median :1.000  Median :0.00000
## Mean   :0.9883  Mean   :0.01171  Mean   :0.996  Mean   :0.00401
## 3rd Qu.:1.0000  3rd Qu.:0.00000  3rd Qu.:1.000  3rd Qu.:0.00000
```

##	Max.	:1.0000	Max.	:1.00000	Max.	:1.000	Max.	:1.00000
##	Harvey.App.N		Harvey.App.Y		Harvey.Final.N		Harvey.Final.Y	
##	Min.	:0.0000	Min.	:0.00000	Min.	:0.0000	Min.	:0.000000
##	1st Qu.	:1.0000	1st Qu.	:0.00000	1st Qu.	:1.0000	1st Qu.	:0.000000
##	Median	:1.0000	Median	:0.00000	Median	:1.0000	Median	:0.000000
##	Mean	:0.9102	Mean	:0.08982	Mean	:0.9925	Mean	:0.007538
##	3rd Qu.	:1.0000	3rd Qu.	:0.00000	3rd Qu.	:1.0000	3rd Qu.	:0.000000
##	Max.	:1.0000	Max.	:1.00000	Max.	:1.0000	Max.	:1.000000
##	FC.App.N		FC.App.Y		Thorson.App.N		Thorson.App.Y	
##	Min.	:0.000	Min.	:0.00000	Min.	:0.0000	Min.	:0.00000
##	1st Qu.	:1.000	1st Qu.	:0.00000	1st Qu.	:1.0000	1st Qu.	:0.00000
##	Median	:1.000	Median	:0.00000	Median	:1.0000	Median	:0.00000
##	Mean	:0.986	Mean	:0.01395	Mean	:0.9578	Mean	:0.04218
##	3rd Qu.	:1.000	3rd Qu.	:0.00000	3rd Qu.	:1.0000	3rd Qu.	:0.00000
##	Max.	:1.000	Max.	:1.00000	Max.	:1.0000	Max.	:1.00000
##	Thorson.Admit.N		Thorson.Admit.Y		Summet.Participant.N			
##	Min.	:0.0000	Min.	:0.00000	Min.	:0.0000		
##	1st Qu.	:1.0000	1st Qu.	:0.00000	1st Qu.	:1.0000		
##	Median	:1.0000	Median	:0.00000	Median	:1.0000		
##	Mean	:0.9751	Mean	:0.02486	Mean	:0.9966		
##	3rd Qu.	:1.0000	3rd Qu.	:0.00000	3rd Qu.	:1.0000		
##	Max.	:1.0000	Max.	:1.00000	Max.	:1.0000		
##	Summet.Participant.Y		Mines.Medal.N		Mines.Medal.Y			
##	Min.	:0.000000	Min.	:0.0000	Min.	:0.0000000		
##	1st Qu.	:0.000000	1st Qu.	:1.0000	1st Qu.	:0.0000000		
##	Median	:0.000000	Median	:1.0000	Median	:0.0000000		
##	Mean	:0.003368	Mean	:0.9995	Mean	:0.0004812		
##	3rd Qu.	:0.000000	3rd Qu.	:1.0000	3rd Qu.	:0.0000000		
##	Max.	:1.000000	Max.	:1.0000	Max.	:1.0000000		
##	SPS.N		SPS.Y		Veteran.N		Veteran.Y	
##	Min.	:0.0000	Min.	:0.000000	Min.	:0.0000	Min.	:0.00000
##	1st Qu.	:1.0000	1st Qu.	:0.000000	1st Qu.	:1.0000	1st Qu.	:0.00000
##	Median	:1.0000	Median	:0.000000	Median	:1.0000	Median	:0.00000
##	Mean	:0.9933	Mean	:0.006736	Mean	:0.9315	Mean	:0.06848
##	3rd Qu.	:1.0000	3rd Qu.	:0.000000	3rd Qu.	:1.0000	3rd Qu.	:0.00000
##	Max.	:1.0000	Max.	:1.000000	Max.	:1.0000	Max.	:1.00000
##	Legacy.N		Legacy.Y		Athlete.N		Athlete.Y	
##	Min.	:0.0000	Min.	:0.0000	Min.	:0.0000	Min.	:0.00000
##	1st Qu.	:1.0000	1st Qu.	:0.0000	1st Qu.	:1.0000	1st Qu.	:0.00000
##	Median	:1.0000	Median	:0.0000	Median	:1.0000	Median	:0.00000
##	Mean	:0.9267	Mean	:0.0733	Mean	:0.9739	Mean	:0.02614
##	3rd Qu.	:1.0000	3rd Qu.	:0.0000	3rd Qu.	:1.0000	3rd Qu.	:0.00000
##	Max.	:1.0000	Max.	:1.0000	Max.	:1.0000	Max.	:1.00000
##	State.CO		State.Other					
##	Min.	:0.0000	Min.	:0.0000				
##	1st Qu.	:0.0000	1st Qu.	:0.0000				
##	Median	:0.0000	Median	:1.0000				
##	Mean	:0.3026	Mean	:0.6974				
##	3rd Qu.	:1.0000	3rd Qu.	:1.0000				
##	Max.	:1.0000	Max.	:1.0000				
##	Citizenship.Foreign.National.International				Citizenship.International			
##	Min.	:0.00000			Min.	:0.000000		
##	1st Qu.	:0.00000			1st Qu.	:0.000000		
##	Median	:0.00000			Median	:0.000000		

```

## Mean      :0.03368                               Mean      :0.001604
## 3rd Qu.:0.00000                               3rd Qu.:0.000000
## Max.      :1.00000                               Max.      :1.000000
## Citizenship.Missing Citizenship.U.S..Citizen
## Min.      :0.000000   Min.      :0.0000
## 1st Qu.:0.000000   1st Qu.:1.0000
## Median :0.000000   Median :1.0000
## Mean     :0.001925   Mean     :0.9471
## 3rd Qu.:0.000000   3rd Qu.:1.0000
## Max.     :1.000000   Max.     :1.0000
## Citizenship.U.S..Permanent.Resident.Green.Card.Holder
## Min.      :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean     :0.01363
## 3rd Qu.:0.00000
## Max.     :1.00000
## Citizenship.Undocumented.DACA Ethnicity.American.Indian.or.Alaska.Native
## Min.      :0.000000   Min.      :0.00000
## 1st Qu.:0.000000   1st Qu.:0.00000
## Median :0.000000   Median :0.00000
## Mean     :0.002085   Mean     :0.01299
## 3rd Qu.:0.000000   3rd Qu.:0.00000
## Max.     :1.000000   Max.     :1.00000
## Ethnicity.Asian Ethnicity.Black.or.African.American
## Min.      :0.00000   Min.      :0.00000
## 1st Qu.:0.00000   1st Qu.:0.00000
## Median :0.00000   Median :0.00000
## Mean     :0.09992   Mean     :0.01716
## 3rd Qu.:0.00000   3rd Qu.:0.00000
## Max.     :1.00000   Max.     :1.00000
## Ethnicity.Hispanic.or.Latino Ethnicity.Missing Ethnicity.Multiracial
## Min.      :0.00000   Min.      :0.000000   Min.      :0.0000000
## 1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.0000000
## Median :0.00000   Median :0.000000   Median :0.0000000
## Mean     :0.05164   Mean     :0.003368   Mean     :0.0001604
## 3rd Qu.:0.00000   3rd Qu.:0.000000   3rd Qu.:0.0000000
## Max.     :1.00000   Max.     :1.000000   Max.     :1.0000000
## Ethnicity.Native.Hawaiian.or.Other.Pacific.Islander Ethnicity.NotDeclared
## Min.      :0.000000   Min.      :0.00000
## 1st Qu.:0.000000   1st Qu.:0.00000
## Median :0.000000   Median :0.00000
## Mean     :0.003689   Mean     :0.04731
## 3rd Qu.:0.000000   3rd Qu.:0.00000
## Max.     :1.000000   Max.     :1.00000
## Ethnicity.Unknown Ethnicity.White
## Min.      :0.0000000   Min.      :0.0000
## 1st Qu.:0.0000000   1st Qu.:1.0000
## Median :0.0000000   Median :1.0000
## Mean     :0.0003208   Mean     :0.7634
## 3rd Qu.:0.0000000   3rd Qu.:1.0000
## Max.     :1.0000000   Max.     :1.0000
## Major.App.Applied.Mathematics...Statistics...Computational...Applied.Mathematics
## Min.      :0.0000

```

```

## 1st Qu.:0.0000
## Median :0.0000
## Mean   :0.0247
## 3rd Qu.:0.0000
## Max.   :1.0000
## Major.App.Applied.Mathematics...Statistics...Statistics
## Min.    :0.000000
## 1st Qu.:0.000000
## Median :0.000000
## Mean    :0.007698
## 3rd Qu.:0.000000
## Max.    :1.000000
## Major.App.Chemical.Engineering
## Min.    :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean    :0.08677
## 3rd Qu.:0.00000
## Max.    :1.00000
## Major.App.Chemical.Engineering...Biological.Engineering.Specialty
## Min.    :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean    :0.08051
## 3rd Qu.:0.00000
## Max.    :1.00000
## Major.App.Chemistry Major.App.Chemistry...Biochemistry.Specialty
## Min.    :0.00000      Min.    :0.0000
## 1st Qu.:0.00000      1st Qu.:0.0000
## Median :0.00000      Median :0.0000
## Mean    :0.01235      Mean    :0.0255
## 3rd Qu.:0.00000      3rd Qu.:0.0000
## Max.    :1.00000      Max.    :1.0000
## Major.App.Chemistry...Environmental.Chemistry.Specialty
## Min.    :0.000000
## 1st Qu.:0.000000
## Median :0.000000
## Mean    :0.003368
## 3rd Qu.:0.000000
## Max.    :1.000000
## Major.App.Civil.Engineering Major.App.Computer.Science
## Min.    :0.00000      Min.    :0.0000
## 1st Qu.:0.00000      1st Qu.:0.0000
## Median :0.00000      Median :0.0000
## Mean    :0.06287      Mean    :0.1007
## 3rd Qu.:0.00000      3rd Qu.:0.0000
## Max.    :1.00000      Max.    :1.0000
## Major.App.Economics Major.App.Electrical.Engineering
## Min.    :0.00000      Min.    :0.00000
## 1st Qu.:0.00000      1st Qu.:0.00000
## Median :0.00000      Median :0.00000
## Mean    :0.01299      Mean    :0.06977
## 3rd Qu.:0.00000      3rd Qu.:0.00000
## Max.    :1.00000      Max.    :1.00000

```

```

## Major.App.Engineering.Physics Major.App.Environmental.Engineering
## Min. :0.00000 Min. :0.00000
## 1st Qu.:0.00000 1st Qu.:0.00000
## Median :0.00000 Median :0.00000
## Mean :0.04683 Mean :0.05437
## 3rd Qu.:0.00000 3rd Qu.:0.00000
## Max. :1.00000 Max. :1.00000
## Major.App.Geological.Engineering Major.App.Geophysical.Engineering
## Min. :0.0000 Min. :0.000000
## 1st Qu.:0.0000 1st Qu.:0.000000
## Median :0.0000 Median :0.000000
## Mean :0.0162 Mean :0.005453
## 3rd Qu.:0.0000 3rd Qu.:0.000000
## Max. :1.0000 Max. :1.000000
## Major.App.Mechanical.Engineering
## Min. :0.0000
## 1st Qu.:0.0000
## Median :0.0000
## Mean :0.2388
## 3rd Qu.:0.0000
## Max. :1.0000
## Major.App.Metallurgical...Materials.Engineering
## Min. :0.00000
## 1st Qu.:0.00000
## Median :0.00000
## Mean :0.01973
## 3rd Qu.:0.00000
## Max. :1.00000
## Major.App.Mining.Engineering Major.App.Missing
## Min. :0.000000 Min. :0.000000
## 1st Qu.:0.000000 1st Qu.:0.000000
## Median :0.000000 Median :0.000000
## Mean :0.009784 Mean :0.003208
## 3rd Qu.:0.000000 3rd Qu.:0.000000
## Max. :1.000000 Max. :1.000000
## Major.App.Petroleum.Engineering Major.App.Undecided First.Contact.ACT
## Min. :0.00000 Min. :0.00000 Min. :0.00000
## 1st Qu.:0.00000 1st Qu.:0.00000 1st Qu.:0.00000
## Median :0.00000 Median :0.00000 Median :0.00000
## Mean :0.03801 Mean :0.08035 Mean :0.09447
## 3rd Qu.:0.00000 3rd Qu.:0.00000 3rd Qu.:0.00000
## Max. :1.00000 Max. :1.00000 Max. :1.00000
## First.Contact.Application First.Contact.Athlete.Form
## Min. :0.0000 Min. :0.000000
## 1st Qu.:0.0000 1st Qu.:0.000000
## Median :0.0000 Median :0.000000
## Mean :0.1524 Mean :0.006897
## 3rd Qu.:0.0000 3rd Qu.:0.000000
## Max. :1.0000 Max. :1.000000
## First.Contact.Campus.Visit First.Contact.College.Fair First.Contact.FUF
## Min. :0.0000 Min. :0.000000 Min. :0.0000
## 1st Qu.:0.0000 1st Qu.:0.000000 1st Qu.:0.0000
## Median :0.0000 Median :0.000000 Median :0.0000
## Mean :0.1254 Mean :0.003368 Mean :0.1545

```

```

## 3rd Qu.:0.0000      3rd Qu.:0.000000      3rd Qu.:0.0000
## Max. :1.0000      Max. :1.000000      Max. :1.0000
## First.Contact.Girls.Lead.the.Way First.Contact.GPA.Form
## Min. :0.000000      Min. :0.000000
## 1st Qu.:0.000000      1st Qu.:0.000000
## Median :0.000000      Median :0.000000
## Mean :0.001443      Mean :0.003368
## 3rd Qu.:0.000000      3rd Qu.:0.000000
## Max. :1.000000      Max. :1.000000
## First.Contact.Inquiry.Form First.Contact.Mailing First.Contact.Materials
## Min. :0.00000      Min. :0.0000000      Min. :0.000000
## 1st Qu.:0.00000      1st Qu.:0.0000000      1st Qu.:0.000000
## Median :0.00000      Median :0.0000000      Median :0.000000
## Mean :0.01588      Mean :0.0004812      Mean :0.003368
## 3rd Qu.:0.00000      3rd Qu.:0.0000000      3rd Qu.:0.000000
## Max. :1.00000      Max. :1.0000000      Max. :1.000000
## First.Contact.MEP First.Contact.Phone First.Contact.Preview.Mines
## Min. :0.000000      Min. :0.0000000      Min. :0.00000
## 1st Qu.:0.000000      1st Qu.:0.0000000      1st Qu.:0.00000
## Median :0.000000      Median :0.0000000      Median :0.00000
## Mean :0.002727      Mean :0.0001604      Mean :0.01395
## 3rd Qu.:0.000000      3rd Qu.:0.0000000      3rd Qu.:0.00000
## Max. :1.000000      Max. :1.0000000      Max. :1.00000
## First.Contact.Royall.Search First.Contact.SAT First.Contact.TOEFL
## Min. :0.0000      Min. :0.00000      Min. :0.0000000
## 1st Qu.:0.0000      1st Qu.:0.00000      1st Qu.:0.0000000
## Median :0.0000      Median :0.00000      Median :0.0000000
## Mean :0.3973      Mean :0.02422      Mean :0.0001604
## 3rd Qu.:1.0000      3rd Qu.:0.00000      3rd Qu.:0.0000000
## Max. :1.0000      Max. :1.00000      Max. :1.0000000
## First.Visit.Campus.Tour First.Visit.Campus.Visit First.Visit.Class.Shadow
## Min. :0.00000      Min. :0.0000      Min. :0.000000
## 1st Qu.:0.00000      1st Qu.:0.0000      1st Qu.:0.000000
## Median :0.00000      Median :0.0000      Median :0.000000
## Mean :0.08613      Mean :0.1511      Mean :0.004972
## 3rd Qu.:0.00000      3rd Qu.:0.0000      3rd Qu.:0.000000
## Max. :1.00000      Max. :1.0000      Max. :1.000000
## First.Visit.Discover.Mines First.Visit.Discovery.Mines.in.Your.City
## Min. :0.00000      Min. :0.000000
## 1st Qu.:0.00000      1st Qu.:0.000000
## Median :0.00000      Median :0.000000
## Mean :0.03352      Mean :0.005453
## 3rd Qu.:0.00000      3rd Qu.:0.000000
## Max. :1.00000      Max. :1.000000
## First.Visit.Girls.Lead.the.Way First.Visit.Launch
## Min. :0.000000      Min. :0.00000
## 1st Qu.:0.000000      1st Qu.:0.00000
## Median :0.000000      Median :0.00000
## Mean :0.003528      Mean :0.03176
## 3rd Qu.:0.000000      3rd Qu.:0.00000
## Max. :1.000000      Max. :1.00000
## First.Visit.Making.The.Connection First.Visit.Meet.Me.at.Mines
## Min. :0.0000      Min. :0.000000
## 1st Qu.:0.0000      1st Qu.:0.000000

```



```

## Median :0.0000                      Median :0.000000
## Mean   :0.0154                      Mean    :0.005293
## 3rd Qu.:0.0000                      3rd Qu.:0.000000
## Max.   :1.0000                      Max.    :1.000000
## First.Visit.None First.Visit.Preview.Mines
## Min.    :0.0000    Min.    :0.000000
## 1st Qu.:0.0000    1st Qu.:0.000000
## Median :1.0000    Median :0.000000
## Mean   :0.5931    Mean    :0.03111
## 3rd Qu.:1.0000    3rd Qu.:0.000000
## Max.   :1.0000    Max.    :1.000000
## First.Visit.Preview.Mines.In.Your.City Sport.Men.s.Varsity.Baseball
## Min.    :0.000000                      Min.    :0.0000000
## 1st Qu.:0.000000                      1st Qu.:0.0000000
## Median :0.000000                      Median :0.0000000
## Mean   :0.03865                      Mean    :0.0009623
## 3rd Qu.:0.000000                      3rd Qu.:0.0000000
## Max.   :1.000000                      Max.    :1.0000000
## Sport.Men.s.Varsity.Basketball Sport.Men.s.Varsity.Football
## Min.    :0.000000                      Min.    :0.000000
## 1st Qu.:0.000000                      1st Qu.:0.000000
## Median :0.000000                      Median :0.000000
## Mean   :0.001443                      Mean    :0.01363
## 3rd Qu.:0.000000                      3rd Qu.:0.000000
## Max.   :1.000000                      Max.    :1.000000
## Sport.Men.s.Varsity.Golf Sport.Men.s.Varsity.Soccer
## Min.    :0.0000000                      Min.    :0.0000000
## 1st Qu.:0.0000000                      1st Qu.:0.0000000
## Median :0.0000000                      Median :0.0000000
## Mean   :0.0004812                      Mean    :0.0009623
## 3rd Qu.:0.0000000                      3rd Qu.:0.0000000
## Max.   :1.0000000                      Max.    :1.0000000
## Sport.Men.s.Varsity.Wrestling Sport.None
## Min.    :0.000000                      Min.    :0.0000
## 1st Qu.:0.000000                      1st Qu.:1.0000
## Median :0.000000                      Median :1.0000
## Mean   :0.002406                      Mean    :0.9739
## 3rd Qu.:0.000000                      3rd Qu.:1.0000
## Max.   :1.000000                      Max.    :1.0000
## Sport.Varsity.Swimming.Diving Sport.Varsity.Track.Field
## Min.    :0.0000000                      Min.    :0.000000
## 1st Qu.:0.0000000                      1st Qu.:0.000000
## Median :0.0000000                      Median :0.000000
## Mean   :0.0001604                      Mean    :0.002406
## 3rd Qu.:0.0000000                      3rd Qu.:0.000000
## Max.   :1.0000000                      Max.    :1.000000
## Sport.Varsity.XCountry Sport.Women.s.Varsity.Basketball
## Min.    :0.0000000                      Min.    :0.000000
## 1st Qu.:0.0000000                      1st Qu.:0.000000
## Median :0.0000000                      Median :0.000000
## Mean   :0.0006415                      Mean    :0.001123
## 3rd Qu.:0.0000000                      3rd Qu.:0.000000
## Max.   :1.0000000                      Max.    :1.000000
## Sport.Women.s.Varsity.Soccer Sport.Women.s.Varsity.Softball

```

```
## Min. :0.0000000 Min. :0.0000000
## 1st Qu.:0.0000000 1st Qu.:0.0000000
## Median :0.0000000 Median :0.0000000
## Mean :0.0006415 Mean :0.0004812
## 3rd Qu.:0.0000000 3rd Qu.:0.0000000
## Max. :1.0000000 Max. :1.0000000
## Sport.Women.s.Varsity.Volleyball App.Created.Days Age
## Min. :0.0000000 Min. :0.000000 Min. :0.00000
## 1st Qu.:0.0000000 1st Qu.:0.004872 1st Qu.:0.09615
## Median :0.0000000 Median :0.005385 Median :0.19231
## Mean :0.0008019 Mean :0.005386 Mean :0.18908
## 3rd Qu.:0.0000000 3rd Qu.:0.006038 3rd Qu.:0.26923
## Max. :1.0000000 Max. :1.000000 Max. :1.00000
## HS.GPA SATR.Converted Review.OutsideActivity
## Min. :0.0000 Min. :0.0000 Min. :0.0000
## 1st Qu.:0.8772 1st Qu.:0.6176 1st Qu.:0.6667
## Median :0.9472 Median :0.7059 Median :1.0000
## Mean :0.9208 Mean :0.6974 Mean :0.7998
## 3rd Qu.:0.9914 3rd Qu.:0.7941 3rd Qu.:1.0000
## Max. :1.0000 Max. :1.0000 Max. :1.0000
## Review.Leadership Review.WorkExp Review.WorkEthic Review.ExpDiversity
## Min. :0.0000 Min. :0.0000 Min. :0.0000 Min. :0.0000
## 1st Qu.:0.0000 1st Qu.:0.3333 1st Qu.:0.6667 1st Qu.:0.6667
## Median :0.3333 Median :0.3333 Median :1.0000 Median :0.6667
## Mean :0.4473 Mean :0.4332 Mean :0.8087 Mean :0.7406
## 3rd Qu.:0.6667 3rd Qu.:0.6667 3rd Qu.:1.0000 3rd Qu.:1.0000
## Max. :1.0000 Max. :1.0000 Max. :1.0000 Max. :1.0000
## Review.DesireAttend Review.Affinity Review.InnovEntrep Review.Teamwork
## Min. :0.0000 Min. :0.0000 Min. :0.0000 Min. :0.0000
## 1st Qu.:0.3333 1st Qu.:0.3333 1st Qu.:0.0000 1st Qu.:0.3333
## Median :0.6667 Median :0.6667 Median :0.0000 Median :0.6667
## Mean :0.5927 Mean :0.5322 Mean :0.2156 Mean :0.6583
## 3rd Qu.:1.0000 3rd Qu.:0.6667 3rd Qu.:0.3333 3rd Qu.:1.0000
## Max. :1.0000 Max. :1.0000 Max. :1.0000 Max. :1.0000
## Review.OverallFit Logins.60Days EventCount.All
## Min. :0.0000 Min. :0.0000000 Min. :0.00000
## 1st Qu.:0.7000 1st Qu.:0.0000000 1st Qu.:0.00000
## Median :0.8000 Median :0.0000000 Median :0.00000
## Mean :0.7732 Mean :0.0008096 Mean :0.08222
## 3rd Qu.:0.9000 3rd Qu.:0.0000000 3rd Qu.:0.16667
## Max. :1.0000 Max. :1.0000000 Max. :1.00000
## EventCount.Admitted EventCount.Campus
## Min. :0.00000 Min. :0.00000
## 1st Qu.:0.00000 1st Qu.:0.00000
## Median :0.00000 Median :0.00000
## Mean :0.06796 Mean :0.07549
## 3rd Qu.:0.00000 3rd Qu.:0.16667
## Max. :1.00000 Max. :1.00000
```

```
dfNormDatAndFactor <- cbind(dfDataSetKNN[1], dfNormData)
str(dfNormDatAndFactor)
```

```
## 'data.frame': 6235 obs. of 139 variables:
## $ Enrolling
## $ Sex.F
```

```
: Factor w/ 2 levels
: num 0 0 0 0 0
```

## \$ Sex.M	: num	1	1	1	1	1	1	1	1
## \$ Expel.N	: num	1	1	1	1	1	1	1	1
## \$ Expel.Y	: num	0	0	0	0	0	0	0	0
## \$ First.Gen.N	: num	1	1	1	1	1	1	1	1
## \$ First.Gen.Y	: num	0	0	0	0	0	0	0	0
## \$ Challenge.Tag.N	: num	1	1	1	1	1	1	1	1
## \$ Challenge.Tag.Y	: num	0	0	0	0	0	0	0	0
## \$ Boettcher.Semi.N	: num	1	1	1	1	1	1	1	1
## \$ Boettcher.Semi.Y	: num	0	0	0	0	0	0	0	0
## \$ Boettcher.Final.N	: num	1	1	1	1	1	1	1	1
## \$ Boettcher.Final.Y	: num	0	0	0	0	0	0	0	0
## \$ Daniels.Semi.N	: num	1	1	1	1	1	1	1	1
## \$ Daniels.Semi.Y	: num	0	0	0	0	0	0	0	0
## \$ Daniels.Final.N	: num	1	1	1	1	1	1	1	1
## \$ Daniels.Final.Y	: num	0	0	0	0	0	0	0	0
## \$ Harvey.App.N	: num	1	1	1	1	1	1	1	1
## \$ Harvey.App.Y	: num	0	0	0	0	0	0	0	0
## \$ Harvey.Final.N	: num	1	1	1	1	1	1	1	1
## \$ Harvey.Final.Y	: num	0	0	0	0	0	0	0	0
## \$ FC.App.N	: num	1	1	1	1	1	1	1	1
## \$ FC.App.Y	: num	0	0	0	0	0	0	0	0
## \$ Thorson.App.N	: num	1	1	1	1	1	1	1	1
## \$ Thorson.App.Y	: num	0	0	0	0	0	0	0	0
## \$ Thorson.Admit.N	: num	1	1	1	1	1	1	1	1
## \$ Thorson.Admit.Y	: num	0	0	0	0	0	0	0	0
## \$ Summet.Participant.N	: num	1	1	1	1	1	1	1	1
## \$ Summet.Participant.Y	: num	0	0	0	0	0	0	0	0
## \$ Mines.Medal.N	: num	1	1	1	1	1	1	1	1
## \$ Mines.Medal.Y	: num	0	0	0	0	0	0	0	0
## \$ SPS.N	: num	1	1	1	1	1	1	1	1
## \$ SPS.Y	: num	0	0	0	0	0	0	0	0
## \$ Veteran.N	: num	1	1	1	1	1	1	1	1
## \$ Veteran.Y	: num	0	0	0	0	0	0	0	0
## \$ Legacy.N	: num	1	1	1	1	1	1	1	1
## \$ Legacy.Y	: num	0	0	0	0	0	0	0	0
## \$ Athlete.N	: num	1	1	1	1	1	1	1	1
## \$ Athlete.Y	: num	0	0	0	0	0	0	0	0
## \$ State.CO	: num	1	0	0	1	0	1	0	1
## \$ State.Other	: num	0	1	1	0	1	0	1	0
## \$ Citizenship.Foreign.National.International	: num	0	0	0	0	0	0	0	0
## \$ Citizenship.International	: num	0	0	0	0	0	0	0	0
## \$ Citizenship.Missing	: num	0	0	0	0	0	0	0	0
## \$ Citizenship.U.S..Citizen	: num	1	1	1	1	1	1	1	1
## \$ Citizenship.U.S..Permanent.Resident.Green.Card.Holder	: num	0	0	0	0	0	0	0	0
## \$ Citizenship.Undocumented.DACA	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.American.Indian.or.Alaska.Native	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.Asian	: num	1	0	0	0	0	0	0	0
## \$ Ethnicity.Black.or.African.American	: num	0	0	0	0	1	0	0	0
## \$ Ethnicity.Hispanic.or.Latino	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.Missing	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.Multiracial	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.Native.Hawaiian.or.Other.Pacific.Islander	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.NotDeclared	: num	0	0	0	0	0	0	0	0
## \$ Ethnicity.Unknown	: num	0	0	0	0	0	0	0	0

```

## $ Ethnicity.White : num 0 1 1 1 0
## $ Major.App.Applied.Mathematics...Statistics...Computational...Applied.Mathematics: num 0 0 0 0 0
## $ Major.App.Applied.Mathematics...Statistics...Statistics : num 0 0 0 0 0
## $ Major.App.Chemical.Engineering : num 0 0 0 0 0
## $ Major.App.Chemical.Engineering...Biological.Engineering.Specialty : num 0 0 0 0 0
## $ Major.App.Chemistry : num 0 0 0 0 0
## $ Major.App.Chemistry...Biochemistry.Specialty : num 0 0 0 0 0
## $ Major.App.Chemistry...Environmental.Chemistry.Specialty : num 0 0 0 0 0
## $ Major.App.Civil.Engineering : num 1 0 0 0 0
## $ Major.App.Computer.Science : num 0 0 0 0 0
## $ Major.App.Economics : num 0 0 0 0 0
## $ Major.App.Electrical.Engineering : num 0 0 0 0 0
## $ Major.App.Engineering.Physics : num 0 0 0 0 0
## $ Major.App.Environmental.Engineering : num 0 0 0 0 0
## $ Major.App.Geological.Engineering : num 0 0 0 0 0
## $ Major.App.Geophysical.Engineering : num 0 0 0 0 0
## $ Major.App.Mechanical.Engineering : num 0 1 1 1 1
## $ Major.App.Metallurgical...Materials.Engineering : num 0 0 0 0 0
## $ Major.App.Mining.Engineering : num 0 0 0 0 0
## $ Major.App.Missing : num 0 0 0 0 0
## $ Major.App.Petroleum.Engineering : num 0 0 0 0 0
## $ Major.App.Undecided : num 0 0 0 0 0
## $ First.Contact.ACT : num 1 1 0 0 0
## $ First.Contact.Application : num 0 0 0 0 0
## $ First.Contact.Athlete.Form : num 0 0 0 0 0
## $ First.Contact.Campus.Visit : num 0 0 0 1 0
## $ First.Contact.College.Fair : num 0 0 0 0 0
## $ First.Contact.FUF : num 0 0 0 0 0
## $ First.Contact.Girls.Lead.the.Way : num 0 0 0 0 0
## $ First.Contact.GPA.Form : num 0 0 1 0 0
## $ First.Contact.Inquiry.Form : num 0 0 0 0 0
## $ First.Contact.Mailing : num 0 0 0 0 0
## $ First.Contact.Materials : num 0 0 0 0 0
## $ First.Contact.MEP : num 0 0 0 0 0
## $ First.Contact.Phone : num 0 0 0 0 0
## $ First.Contact.Preview.Mines : num 0 0 0 0 0
## $ First.Contact.Royall.Search : num 0 0 0 0 1
## $ First.Contact.SAT : num 0 0 0 0 0
## $ First.Contact.TOEFLE : num 0 0 0 0 0
## $ First.Visit.Campus.Tour : num 0 1 0 0 0
## $ First.Visit.Campus.Visit : num 0 0 0 1 0
## $ First.Visit.Class.Shadow : num 0 0 0 0 0
## $ First.Visit.Discover.Mines : num 0 0 0 0 0
## [list output truncated]

```