Final Case Tie-In

For the first potential relationship to between whether or not a UT alum donated during 2019 and another feature, I originally began looking at if there was a relationship between previous years having total donations that were less than average. This was the code that I began my thought process with:

```
#Less than average emails in this year?

summary(DONATE$EMAILS_OPENED_2011)

TotalEmails <- (DONATE$EMAILS_OPENED_2018+DONATE$EMAILS_OPENED_2017+DONATE$EMAILS_OPENED_2016+DONATE$EMAILS_OPENED_2015+DONATE$EMAILS_OPENED_2014+DONATE$EMAILS_OPENED_2013+DONATE$EMAILS_OPENED_2012+DONATE$EMAI
mosaic(Donated19~EmailsOpened, data = DONATE)

Emails18 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2018 < 15.25, "Yes", "No" ) )
Emails17 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2017 < 15.13, "Yes", "No" ) )
Emails16 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2016 < 7.948, "Yes", "No" ) )
Emails15 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2015 < 9.405, "Yes", "No" ) )
Emails14 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2014 < 8.531, "Yes", "No" ) )
Emails13 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2013 < 6.876, "Yes", "No" ) )
Emails12 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2012 < 5.342, "Yes", "No" ) )
Emails11 <- DONATE$BirthGradIssue <- factor( ifelse( TotalEmails -DONATE$EMAILS_OPENED_2011 < 1.818, "Yes", "No" ) )
```
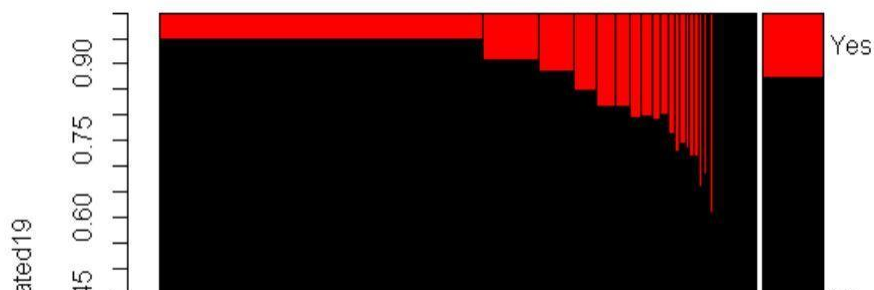
After finding that there is NOT a relationship between these two, I kept the same variable that I would like to manipulate (Emails Opened), and decided to utilize the apply function to any column that had "EMAILS_OPENED", shown below:

```
apply( DONATE[,grep("EMAILS_OPENED",names(DONATE))] , 1, sum )

DONATE$TOTALEMAILSOPENED <- apply( DONATE[,grep("EMAILS_CLICKED",names(DONATE))] , 1, sum )

mosaic(Donated19~DONATE$TOTALEMAILSOPENED, data = DONATE)
```

The following mosaic plot was produced. As you can see, there is a relationship between alum opening emails from UT and whether or not the donated in the year of 2019.

The second feature that I wanted to create would look at an alum's attendance at football games in a given year, if it affected (or if there was a relationship between) them donating in 2019. The following code was run:

```
DONATE$TOTALGAMESATT <- apply(DONATE[,grep("NUM_FB_GAMES",names(DONATE))],1,sum)

FOOTBAWLTIMEINTN <- c()
for(i in 1:nrow(DONATE)) {
  if(DONATE$TOTALGAMESATT[i] >= mean(DONATE$TOTALGAMESATT)){
    FOOTBAWLTIMEINTN[i] <- "above average"
  }
  if(DONATE$TOTALGAMESATT[i] <= mean(DONATE$TOTALGAMESATT)){
    FOOTBAWLTIMEINTN[i] <- "less than average"
  }
}

DONATE$MORETHANAVERAGEGAMES <- factor(FOOTBAWLTIMEINTN)
mosaic(Donated19~MORETHANAVERAGEGAMES, data = DONATE, equal = TRUE)
```

I found that there is a positive relationship between game attendance being higher than average and an alum donating in 2019, seen in the mosaic plot below: