Stat 400 Project - Group 4

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Article

We chose the article "Using Monte Carlo Simulation to Calculate Match Importance: The Case of English Premier League" by Jiri Lahvicka. This article describes the process of using Monte Carlo simulations to predict the outcome of a match given the results of previous matches. It then goes further and uses Monte Carlo simulations to predict the final ranking of the teams in the English Premier League at the end of a season.

Soccer Information

What is necessary information on soccer? There are 20 teams in the English Premier League. Each team plays 19 away games and 19 home games?

Data Manipulation

We wanted to use the specific variables FTR, FTAG, and FTHG, along with the identifier variables of Date, Away Team, and Home Team. There were no NA values in any of our selected variables.

```
## # A tibble: 1,254 x 9
## # Groups:   AwayTeam [20]
##    Date     HomeTeam    AwayTeam FTHG  FTAG FTR      Id
##    <chr>    <chr>       <chr>    <int> <int> <chr> <int>
##  1 13/08/11 Newcastle   Arsenal      0     0 D        4
##  2 28/08/11 Man United  Arsenal      8     2 H       26
##  3 17/09/11 Blackburn   Arsenal      4     3 H       41
##  4 02/10/11 Tottenham   Arsenal      2     1 H       69
##  5 29/10/11 Chelsea     Arsenal      3     5 A       90
##  6 19/11/11 Norwich     Arsenal      1     2 A      112
##  7 03/12/11 Wigan       Arsenal      0     4 A      136
##  8 18/12/11 Man City    Arsenal      1     0 H      157
##  9 21/12/11 Aston Villa Arsenal      1     2 A      162
## 10 02/01/12 Fulham      Arsenal      2     1 H      192
## #     with 1,244 more rows
```

Prediction for Match 2014-2015 Chelsea (home) vs Liverpool (away)

Predictions are in terms of the home team
Actual result was a draw

```
##    Match Result Occurances Percent
## 1           Win      51999  51.999
## 2          Loss      29180  29.180
## 3          Draw      18821  18.821
```

Prediction for Match 2013-2014 Manchester City (home) vs Newcastle (away)

Predictions are in terms of the home team
Actual result was a home win

```
##   Match Result Occurances Percent
## 1          Win      60084  60.084
## 2         Loss      23188  23.188
## 3         Draw      16728  16.728
```

Going Forward

In the next week we plan to continue to expand on our exploration of this data. We plan to integrate code into our Monte Carlo function to predict the final rank of any two teams we have chosen at the time of a specific match. We also hope to add to our final contingency table a variable that consists of the probability of the ranks for these two teams to add to the number of wins, losses, and draws they had in our simulations.