NFL POWER RATINGS

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OVERVIEW

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STUDENT OBJECTIVES

- Understand the Elo algorithm better

- Gather data from all the NFL teams

- Enhance my skills in Java, JavaScript, HTML, CSS and php MyAdmin

- By creating this program, it will give the user an idea of where their favorite team would be in the standings

PROBLEM SPECIFICATION

- NFL Power Ratings is going to calculate the two team's strength in playing.

- The home or away team wining makes the ratings update.

- The way this is going to work is by getting the overall ratings from FiveThirtyEight.

- The Elo ratings are going to be based on the 2020-2021 season.]

- Two teams will play, and we already have the rating for the team from FiveThirtyEight and we plug those Elo ratings into the equation, and it will give the rating for each team for that matchup. Going back onto the 2020-2021 season we can see the final score and then update the rating for each team.

- As whatever team wins the game then K comes into play, K is an update factor for the ratings after the week.

- I will set the maximum number of points to 15, this is what the team gains after winning the game

- R1 is the new home team rating for the equation

- R2 is the new away team equation

PROBLEM SPECIFICATION

- Step 1
  - The new rating for the home team, $R(Home) = 10^{R1}/400$
  - The new rating for the away team, $R(Away) = 10^{R2}/400$
- Step 2
  - $E(Home) = R1/(R1+R2) =$ probability of winning of home team
  - $E(Away) = R2/(R2+R1) =$ probability of winning of away team
- Step 3
  - The equation if the home team wins is $r1 = r1 + K*(S1-E1)$
  - The equation if the home team wins is $r2 = r2 + K*(S2-E2)$

EXAMPLE

- Step 4

- Ravens Elo rating= 1200

- Cardinals Elo rating= 1000

- R1=Ravens= 10^1200/400=1000

- R2=Cardinals=10^1000/400=316.2

- probability of winning, E(Ravens) = 1000/(1000+316.2) =.76

- probability of winning, E(Cardinals)= 316.2/(316.2+1000)=.24

Home= Ravens
Away=Cardinals
E1=1000
E2=316.2
R1=0.76
R2=0.24
S1=1
S2=0

EXAMPLE CONTINUED

$r1 = R1 + K*(S1 - E1)$

$r2 = R2 + K*(S2 - E2)$

- Ravens= 1200+15*(1-.76)=1203.6 (Updated ratings if ravens win)

- Cardinals= 1000+15*(0-.24)=996.4 (Updated ratings if ravens win)

- Ravens= 1200+15*(0-.76)=1188.6 (Updated ratings if cardinals win)

- Cardinals= 1000+15*(1-.24)=1011.4 (Updated ratings if cardinals win)

SOLUTION DESIGN
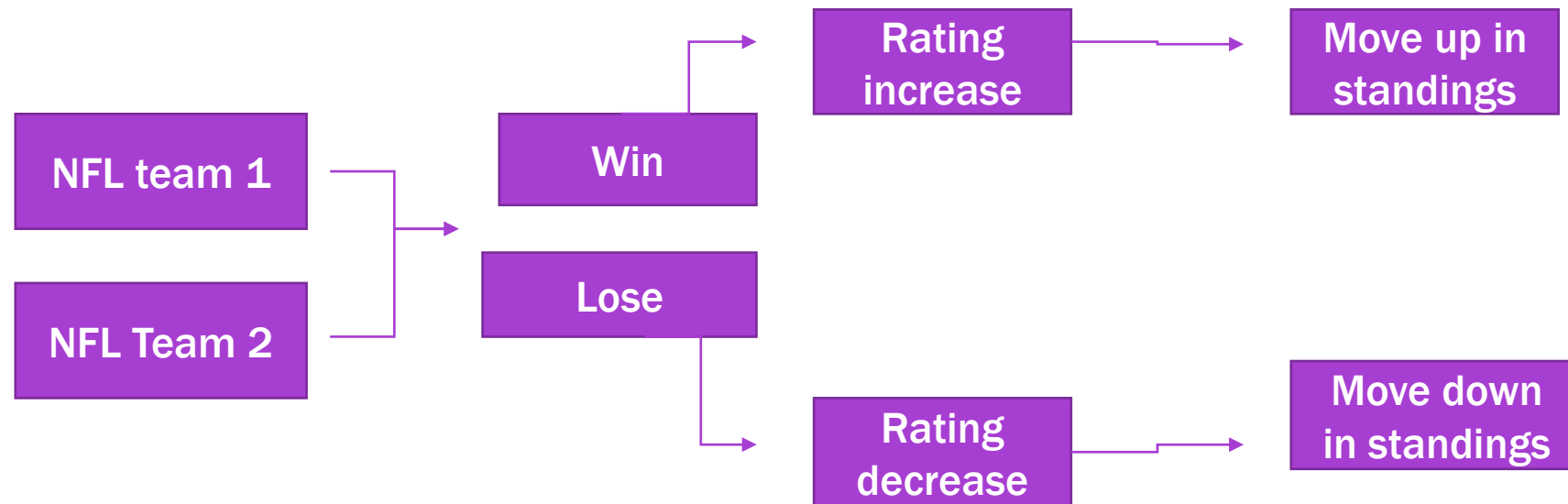
SOLUTION DESIGN

- There will be 32 NFL teams

- By picking two teams to play that are playing week one and having the scores, we can see what their ratings will be for week 2

- If the team wins their Elo rating increases and move up in the standings

- If the team loses their Elo rating decreases and move down in the standings

SOLUTION DESIGN

Example of 2 teams and scores :

SOLUTION DESIGN

Example of standings with Elo rating :

ELO RATING	1-WEEK CHANGE	TEAM	DIVISION
1732	+29	Buccaneers 15-5	NFC South
1713		Chiefs 16-3	AFC West
1699		Bills 15-4	AFC East
1692		Packers 14-4	NFC North
1670		Saints 13-5	NFC South
1656		Ravens 12-6	AFC North
1605		Rams 11-7	NFC West
1596		Seahawks 12-5	NFC West
1590		Colts 11-6	AFC South
1578		Titans 11-6	AFC South
1546		Dolphins 10-6	AFC East
1545		Browns 12-6	AFC North
1537		Steelers 12-5	AFC North
1499		Patriots 7-9	AFC East
1493		Chargers 7-9	AFC West
1492		Bears 8-9	NFC North
1489		Vikings 7-9	NFC North
1483		49ers 6-10	NFC West
1477		Cardinals 8-8	NFC West

LIST OF TOOLS

- Java

- HTML,CSS, JavaScript,

- Php MyAdmin

- WinSCP

- Github

- FiveThirtyEight website

TIME SCHEDULE

1. Weeks 1: Collect data from NFL season of 2020-2021

2. Weeks 2-5: Program the algorithm with Data from previous weeks

3. Weeks 6-11: Make website for the algorithm to see the power ratings

4. Weeks 11-13: Test website to make sure everything works and fix bugs if needed

5. Week 14: Prepare presentation and report

GRADING SCHEME

- Power Rating Algorthim/Programming 40%

- UI 30%

- Report 10%

- Presentation 10%

- Elo/NFL Data Collection 10%

NFL Power Rating
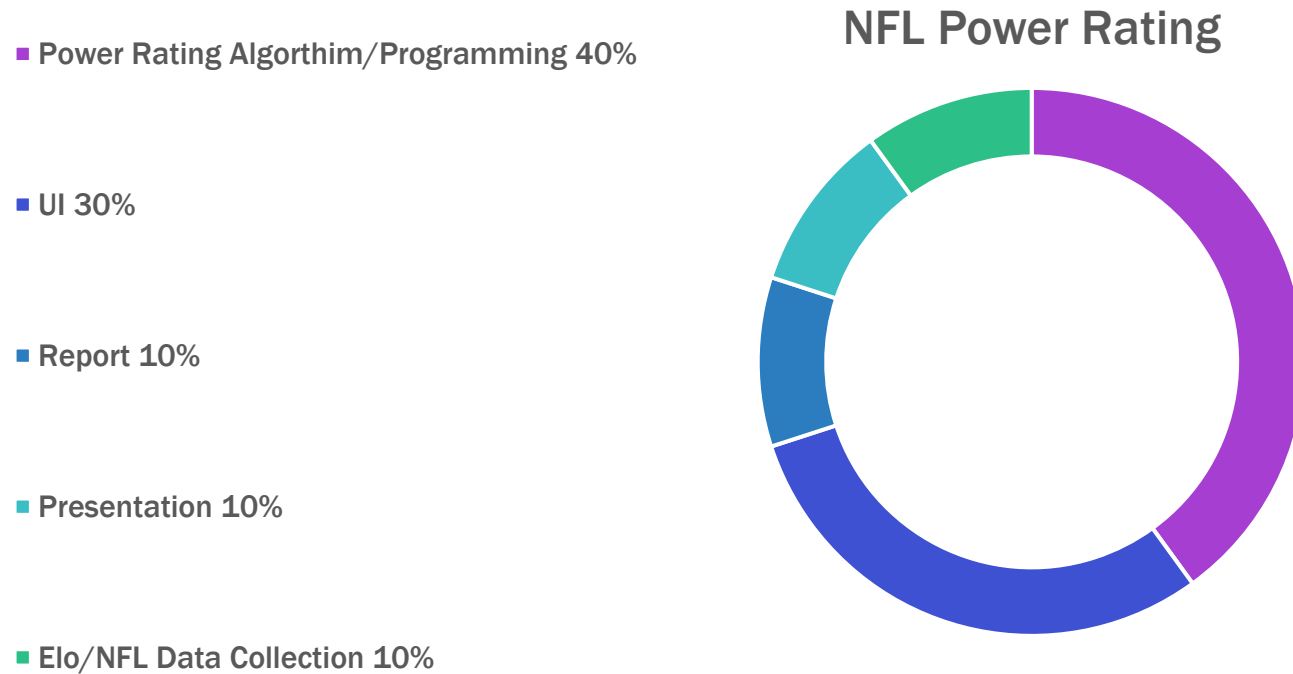
DELIVERABLES

- Proposal

- Source code for the algorithm

- Source code for the website

- All data collection

- Project journal

- Project report

- Final presentation

SOURCES AND REFERENCES

- NateSilver538. (2021, February 8). *2020 NFL Predictions*. FiveThirtyEight. https://projects.fivethirtyeight.com/2020-nfl-predictions/.

- *NFL Football Teams - Official Sites of all 32 NFL Teams*. NFL.com. (n.d.). https://www.nfl.com/teams/.

QUESTIONS?