
Data Visualizations

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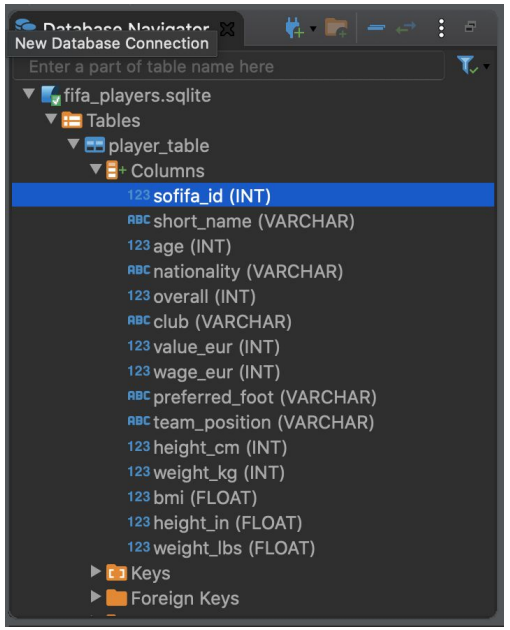
Overview

- FIFA 20 is a simulation video game created by EA sports
- Data based on real player stats from all licensed world football/soccer leagues
- EA has teams that collect the real player data and update it on a consistent basis: 400 data collectors and 6000 reviewers.
- Each player in FIFA Ultimate Team has an overall rating calculated by combining scores for Pace, Shooting, Passing, Dribbling, Defending, and Physical with a player's international recognition.

Extract, Transform, Load

- Downloaded dataset as a CSV from Kaggle
- Identified the attributes relevant to our analysis:
  - nationality, height, weight, age, preferred foot
- Basic cleanup in Jupyter notebook
- Converted height and weight from metric units to improve the visualizations for a US audience
- Calculated BMI as a measure of body type
- Loaded data into a SQLite Database




```
# Convert height to inches and weight to lbs, add new column
general_info["height_in"] = round(general_info["height_cm"] * 0.393701, 1)
general_info["weight_lbs"] = round(general_info["weight_kg"] * 2.20462, 1)

# Add a column for calculated BMI
general_info["bmi"] = round(general_info["weight_kg"] / (general_info["height_cm"] / 100) ** 2, 2)
```

Flask

```python
@app.route("/players")
def stats():
    """Return a list player data"""
    # Query all players
    sel = [
        players.sofifa_id,
        players.short_name,
        players.age,
        players.natio
        players.overa
        players.club,
        players.value
        players.wage_
        players.prefe
        players.team_
        players.bmi,
        players.heigh
        players.weigh
    ]
    results = session
```

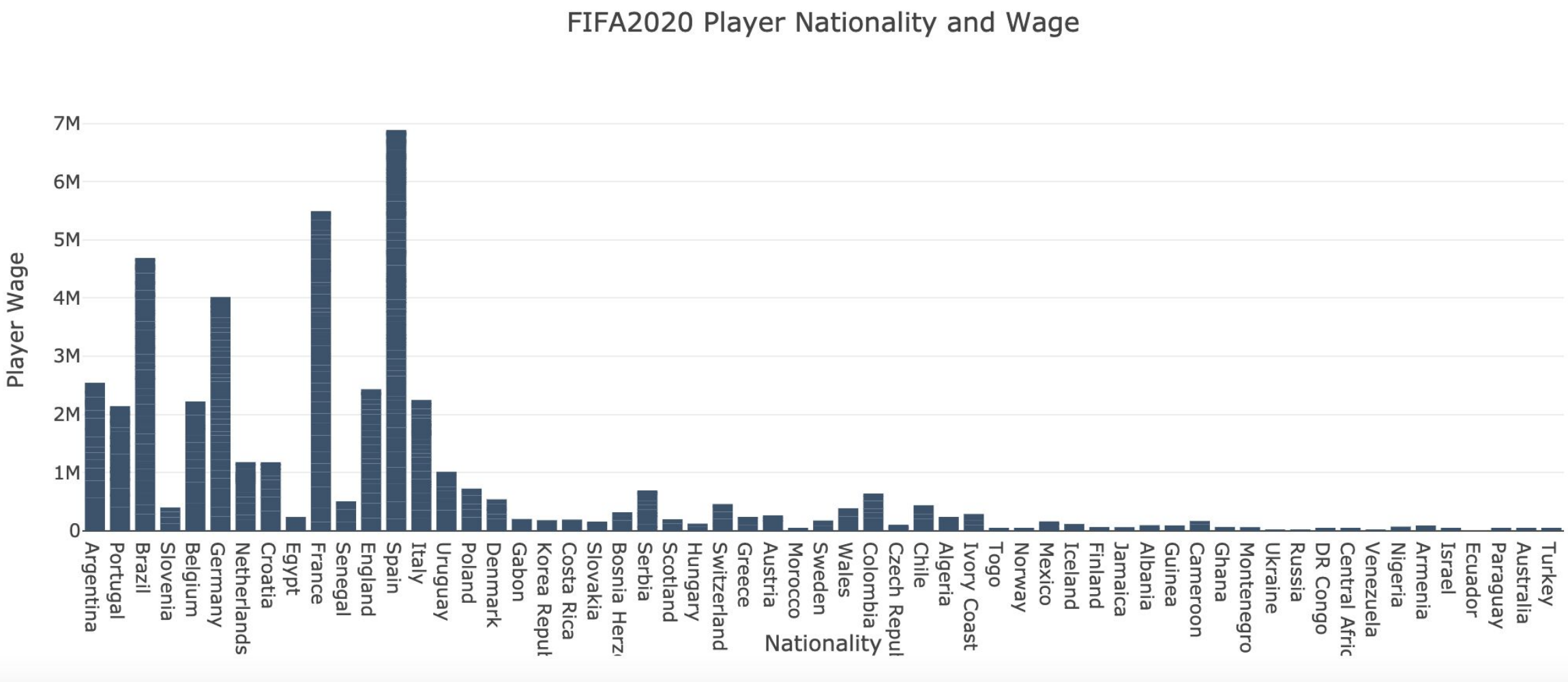
```python
# Create a dictionary from the row data and append
all_players = []

for sofifa_id, short_name, age, nationality, overa
    player_dict = {}
    player_dict["sofifa_id"] = sofifa_id
    player_dict["short_name"] = short_name
    player_dict["age"] = age
    player_dict["nationality"] = nationality
    player_dict["overall"] = overall
    player_dict["club"] = club
    player_dict["value_eur"] = value_eur
    player_dict["wage_eur"] = wage_eur
    player_dict["preferred_foot"] = preferred_foot
    player_dict["team_position"] = team_position
    player_dict["bmi"] = bmi
    player_dict["height_in"] = height_in
    player_dict["weight_lbs"] = weight_lbs
    all_players.append(player_dict)
```


```
[
  {
    "age": 32,
    "bmi": 24.91,
    "club": "FC Barcelona",
    "height_in": 66.9,
    "nationality": "Argentina",
    "overall": 94,
    "preferred_foot": "Left",
    "short_name": "L. Messi",
    "sofifa_id": 158023,
    "team_position": "RW",
    "value_eur": 95500000,
    "wage_eur": 565000,
    "weight_lbs": 158.7
  },
  {
    "age": 34,
    "bmi": 23.74,
    "club": "Juventus",
    "height_in": 73.6,
    "nationality": "Portugal",
    "overall": 93,
    "preferred_foot": "Right",
    Cristiano Ronaldo",
    801,
    : "LW",
    500000,
    000,
    83.0

    Saint-Germain",
    .9,
    "Brazil",

    ": "Right",
    Neymar Jr",
    0871,
    : "CAM",
    5500000,
    000,
    49.9
```

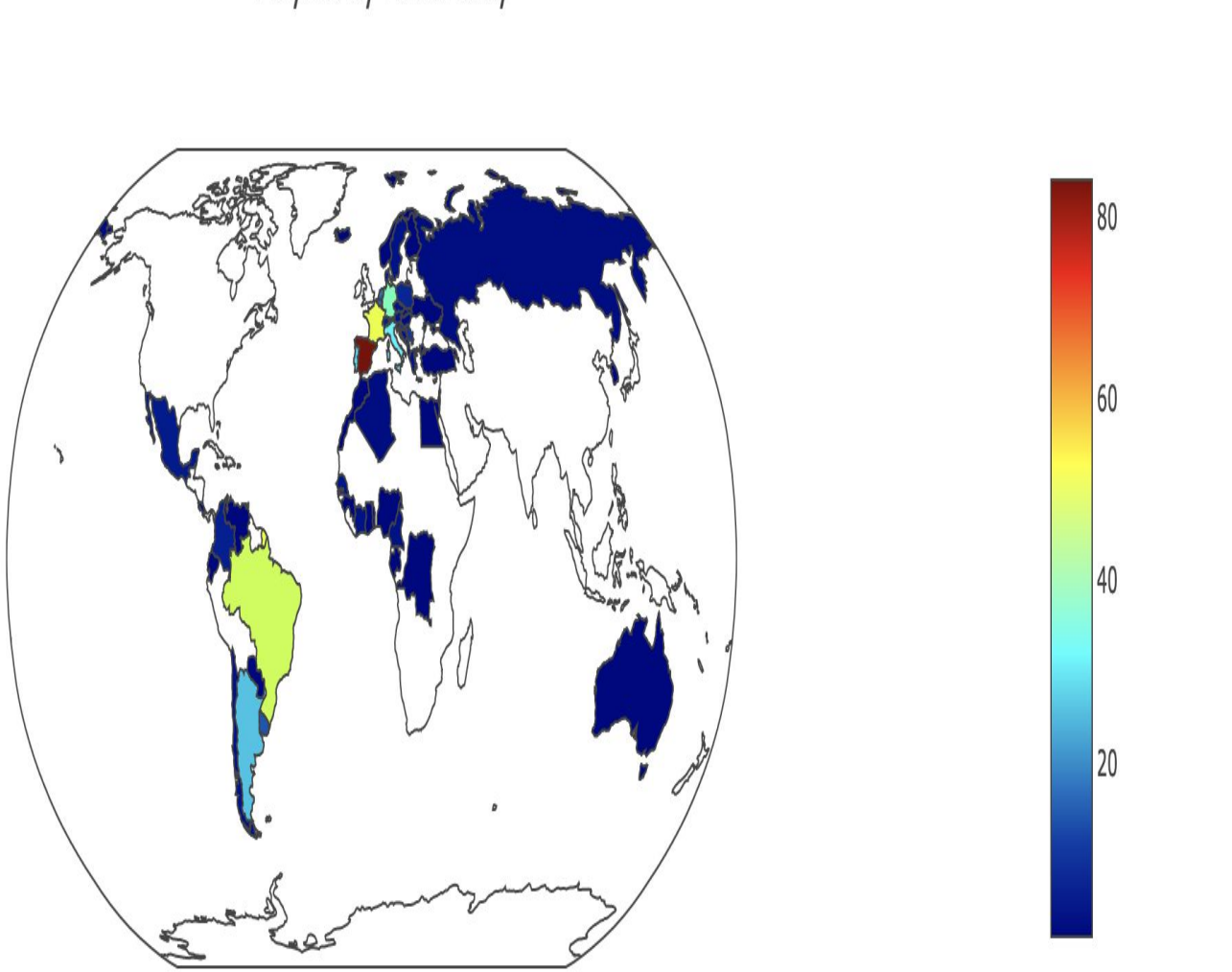

- We created an flask API endpoint “/players” where we could store and retrieve our data
- We then created an array of dictionaries for each of the players data.
- Jsonified the data.

Web Analysis

- We defined two measures of success: a player's wage, and their overall rating to see if we could uncover any trends or correlation between factors not directly related to skill in the top players.
- We also considered reviewing the top 500 of over 1800 players a general measure of success. For our analysis we have decided to use the following charts:
  - Scatter Plot Chart for players physical attributes vs wage/rating
  - Bar Chart for Nationality and Wages
  - Choropleth Heat Map to display the country which produces majority of FIFA players
  - Pie Chart displaying the top 20, top 100, and top 500 players preferred foot.

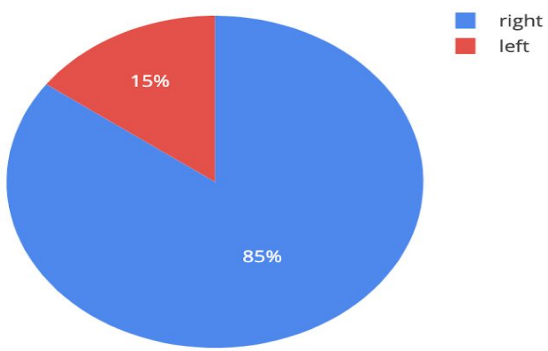

FIFA2020 Player Nationality and Wage
Player Wage
7M
6M
5M
4M
3M
2M
1M
0
Nationality
Argentina
Portugal
Brazil
Slovenia
Belgium
Germany
Netherlands
Croatia
Egypt
France
Senegal
England
Spain
Italy
Uruguay
Poland
Denmark
Gabon
Korea Reput
Costa Rica
Slovakia
Bosnia Herz
Serbia
Scotland
Hungary
Switzerland
Greece
Austria
Morocco
Sweden
Wales
Colombia
Czech Repul
Chile
Algeria
Ivory Coast
Togo
Norway
Mexico
Iceland
Finland
Jamaica
Albania
Guinea
Cameroon
Ghana
Montenegro
Ukraine
Russia
DR Congo
Central Afric
Venezuela
Nigeria
Armenia
Israel
Ecuador
Paraguay
Australia
Turkey

```
Plotly.d3.csv('/old/player_location.csv', function(err, rows){
//Plotly.d3.csv('/data/top_players.csv', function(err, rows){
      function unpack(rows, key) {
          return rows.map(function(row) { return row[key]; });
      }

    var data = [{
      type: 'choropleth',
      locationmode: 'country names',
      locations: unpack(rows, 'country'),
      //locations: unpack(rows, 'nationality'),
      z: unpack(rows, 'nationality'),
      //z: unpack(rows, 'wage_eur'),
      text: unpack(rows, 'country'),
      //text: unpack(rows, 'short_name'),
      colorscale: 'Jet'
    }];

    var layout = {
      title: 'Players by Nationality',
      geo: {
          projection: {
              type: 'robinson'
          }
      }
    };

    Plotly.newPlot("chloropleth", data, layout, {showLink: false});
});
```

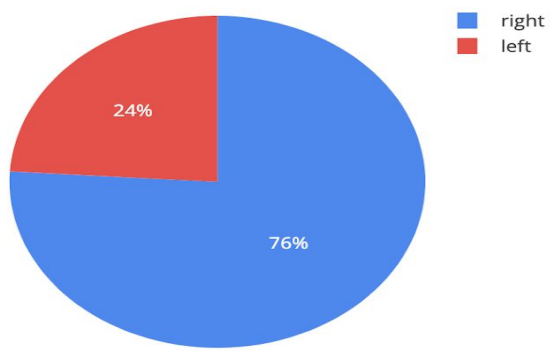


```
function buildCharts() {

  d3.json("top_players.json").then((data) => {
      preferred_foot500 = [];
        for (var i = 0; i < data.length; i++) {
            foot = data[i]["preferred_foot"];
            preferred_foot500.push(foot);
        }
        console.log(preferred_foot500);

        leftFoot500 = []
        rightFoot500 = []
        for (let f in preferred_foot500) {
            if (preferred_foot500[f] === "Left") {
                lf = preferred_foot500[f];
                leftFoot500.push(lf);
            }
            else {
                rf = preferred_foot500[f];
                rightFoot500.push(rf);
            }
        }
```

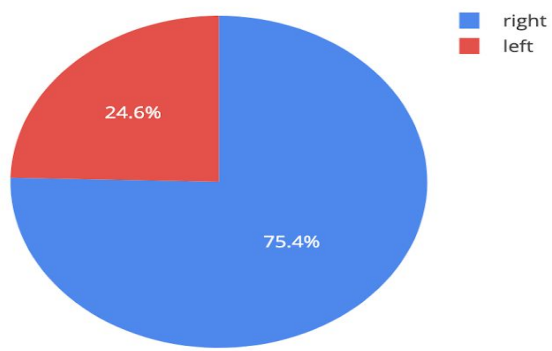
Preferred Foot of Top 20 Players



Preferred Foot of Top 100 Players



Preferred Foot of Top 500 Players



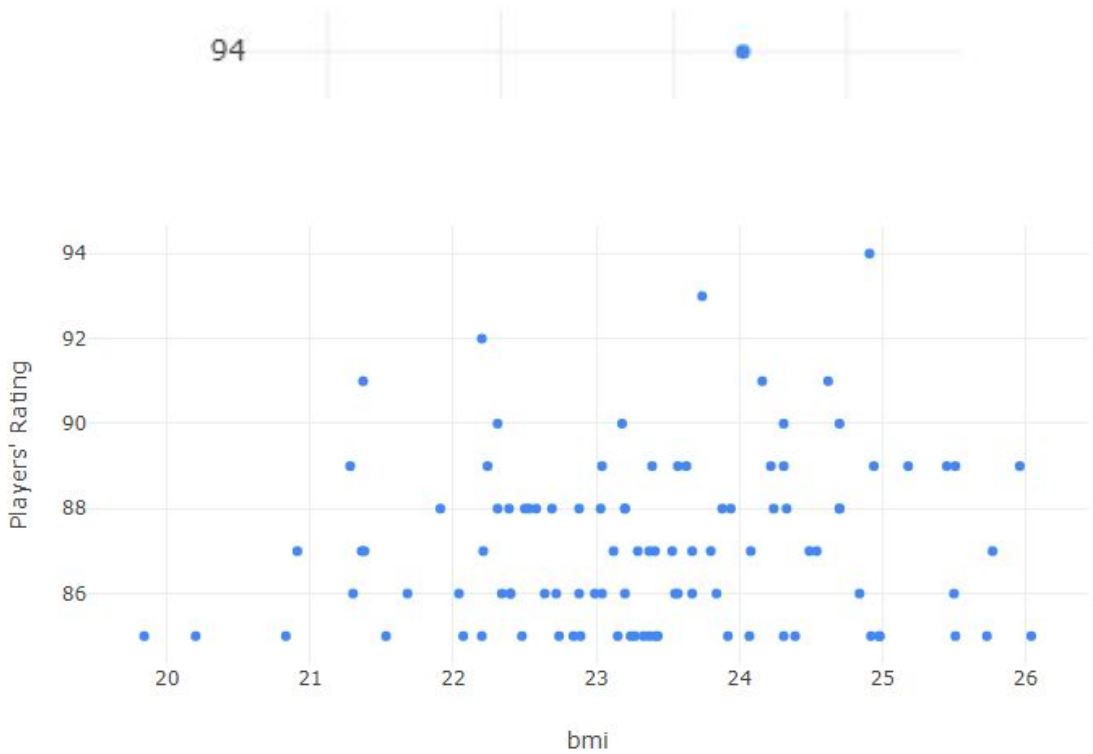
Players' Wages & Ratings vs. Physical Attributes

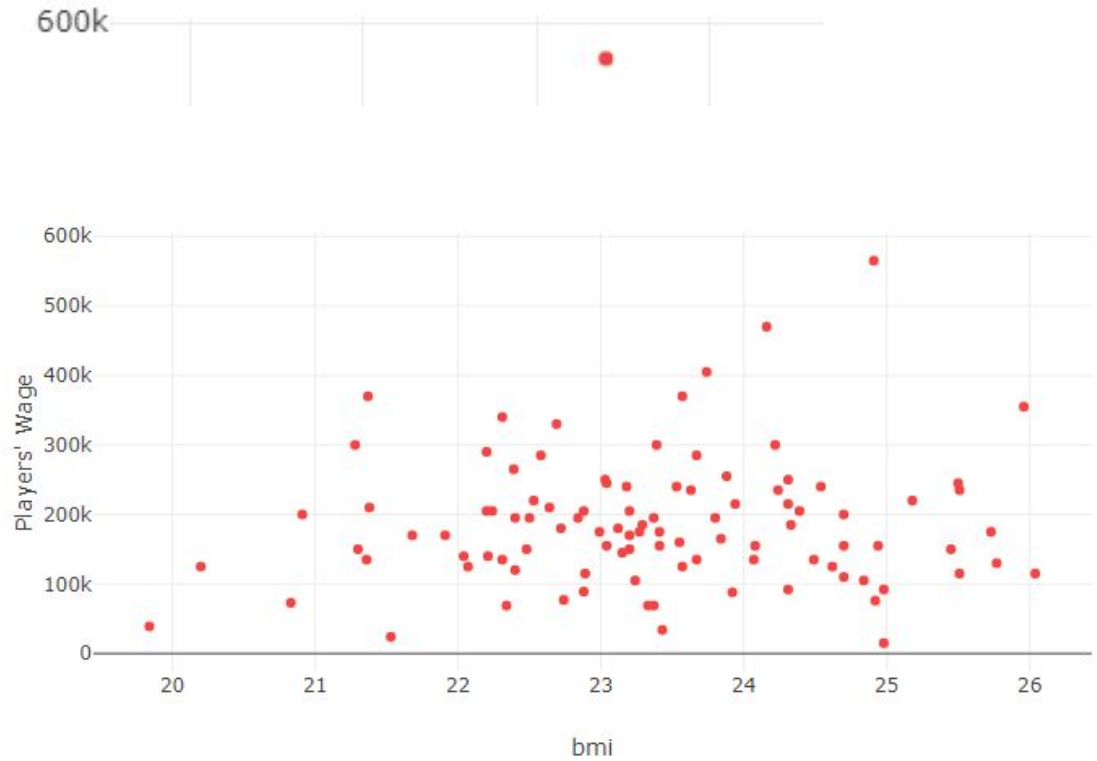
- Attributes
  - Age, Body Mass Index (BMI), Preferred Foot, Height (in), Weight (lbs)
- Data cleanup
  - loaded Json file using d3.json
  - Created arrays and looped through data for values
  - pushed values in arrays
- Chart
  - Scatter plot

```
function init() {
    dropdownMenu = d3.select("#selDataset");

```

```
physicalAttributes = ["age", "bmi", "height_in", "preferred_foot", "weight_lbs"];

physicalAttributes.forEach((attribute) => {
    dropdownMenu
        .append("option")
        .text(attribute)
        .property("value", attribute);
    });
});
```

```
function optionChanged(xAxis) {
    d3.json("top_players.json").then(function(data) {

        axisValues = []
        ratings = []
        wages = []

        for (var i = 0; i < data.length; i++) {
            x = data[i][xAxis];
            overall = data[i]["overall"];
            wage = data[i]["wage_eur"];

            axisValues.push(x);
            ratings.push(overall);
            wages.push(wage);

        }

        console.log(axisValues);

        valueTopPlayers = axisValues.slice(0, 100);
        top_rated = ratings.slice(0, 100);
        top_wages = wages.slice(0, 100);


        wageYAxis = [{
            mode: "markers",
            type: "scatter",
            x: valueTopPlayers,
            y: top_wages,
            text: top_wages,
            marker: {
                color: '#f54242'
              }
        }];
```


94
94
92
90
88
86
Players' Rating
20
21
22
23
24
25
26
bmi


600k
600k
500k
400k
300k
200k
100k
0
Players' Wage
20
21
22
23
24
25
26
bmi

Novel JavaScript Library

- Slick Carousel

```
      <h2>The Team</h2>
    </div>
  </div>
  <div class="row mt-2">
    <div class="col-12 col-lg-5">
      <div class="slick">
        <div><img width="140" src="Headshots/JoshS_Headshot.jpeg" alt="Joshua Sohan"></div>
        <div><img width="140" src="Headshots/Sybile_Cherenfant.png" alt="Sybile Cherenfant"></div>
        <div><img width="140" src="Headshots/GSloupHeadshot.jpg" alt="Genevieve Sloup"></div>
        <div><img width="140" src="Headshots/Raymond_Galan.jpg" alt="Raymond Galan"></div>
      </div>
```

```
$(document).ready(function () {
  $('.slick').slick({
    autoplay: true,
    speed: 1000,
    autoplaySpeed: 2000,
  });
});
```


Questions?