API Research Assignment:

API 1:

Project Name: Spotify Web API

Description of API

Insert a comprehensive description of your dataset. This description will be used/inserted on your landing/home page.

The dataset that is used in this project is sourced from the Spotify Web API. This dataset will allow you to see the comparative difference between 2 artists of your choosing. Moreover, this dataset will be used to compare albums and their individual track qualities through the Spotify web API's audio analysis. With this dataset this site will be able to show you the differences in; the number of monthly listeners an artist has, their most played song and how many streams said song has, the artists popularity (scale of 0 - 100), the genres of music this artist makes, the number of albums they have released, a specific songs audio analysis and much more.

Outline of Dataset Characteristics:

The properties that will be compared are as follows:

- Monthly Listeners: An integer value of the number of users that follow that artist on spotify
- The artists Popularity: This is an integer value measured on a scale of 0-100. This is calculated using the averaged popularity of the artist's tracks.
- The artists top songs/tracks: This returns a list of songs which are considered popular by the spotify algorithm. Along with the tracks name and number this characteristic also returns a popularity score ranging from 0-100
- The artists genre: This returns the genres this artist has released music under.
- The number of albums: This returns the number of albums the artist has as well the number of albums the artist has appeared on.
- Track audio analysis:
    - **Duration**: The length of the song in ms
    - **Danceability**: How suitable the song is for dancing. This characteristic factors in tempo, rhythm stability, beat strength and overall regularity.
    - **Energy**: A scale from 0.0 to 1.0 this represents the song's overall intensity and activity. This characteristic factors in dynamic range, perceived loudness, timbre, onset rate and general entropy. (uncertainty about what pitches will occur).

- **Instrumentalness**: How much of the track contains vocals. The closer this value is to 1.0 the higher the likelihood of it containing no vocals.
- **Liveness**: This determines whether or not the track was recorded live in an audience or not.
- **Loudness**: The tracks total calculated decibels (dB)
- **Tempo**: The tracks calculated beats per minute or BPM.
- **Valence**: This describes the musical positiveness conveyed by a track. Tracks with high valence sound more positive (e.g. happy, cheerful, euphoric. This is measured on a scale of 0.0 to 1.0.

Outline of comparative data:

List the properties that you will use for the comparison page to attain full functionality as outlined in the brief.

- Monthly listeners
- Artists Popularity
- Artists Top Song
- Artists Genres
- Number of albums the artist has released.

Outline of timeline data:

The data that will be used in the timeline will come from the audio track analysis object found within the Spotify Web API. Using this URI the calculated average will appear on the Y axis and the X axis will be allocated to the track number i.eTrack 5 has a danceability score of 0.57 and track 8 has a danceability score of 0.6.

The list of characteristics is as follows:

- Duration
- Danceability
- Energy
- Instrumentalness
- Loudness
- Tempo
- Valence

API 2:

Project Name: API-Football

Description of API:

The dataset provided by API Football is extremely comprehensive and will allow for football player comparisons to be made based on various player statistics, moreover this API will allow us to look at various teams and make team comparisons. This API is structured in such a way that upon selecting a player to compare and view you will be able to find data on: player rating, goals, passes made, tackles, head to heads, dribbles, fouls, cards etc. When viewing a teams data set, statistics on: matches played, wins, draws, loses, goals, etc. (relative to the current season) will be shown.

Outline of Dataset Characteristics:

Outline the properties of your objects. List and describe your object property list.

With this particular API I will be focusing on using 2 sets of objects. Teams, and Players. This way users can compare the teams of the choosing or players of their choosing. The following characteristics will be utilised.

Teams:

- Ranking: This is the teams ranking relative to their league (their current standing on the league table).
- Team name: The name of the team.
- Group: Which league group this team belongs to.
- All stats (The sum of both home and away game statistics):
    - Matches played: The number of matches played.
    - Wins: The number of matches won.
    - Loss: The number of matches lost.
    - Goals scored: The number of cumulative goals the team has scored.
    - Goals conceded: The number of cumulative goals the team has conceded.

Players:

- Basic Player info: This will include the players name, nationality, position, age, current team and league, jersey number, and if they have captaincy.
- Goals: This is the number of goals scored (total, assisted, and saved).
- Shots: The number of shots taken (on and off target).
- Passes: total number of passes made and the players pass accuracy
- tackles : number of tackles (total, blocks and interceptions).
- Game appearances: the number of games this player has appeared in
- Fouls: the number of fouls the player has committed and received.

Outline of comparative data:

List the properties that you will use for the comparison page to attain full functionality as outlined in the brief.

The properties which will be used to compare are:

Teams:

- Season stats:
    - Matches Played
    - Wins
    - Loss
    - Total Goals scored
    - Total Goals Conceded
- Ranking
- Group

Players:

- Goals
- Shots on and off target
- Passes (with a percentage for pass accuracy)
- tackles
- Game appearances

Outline of timeline data:

The data shown in the timeline will be as follows:

Teams:

- **Goals scored** throughout the season: Y-axis corresponding to goals scored and the X-axis corresponding to the Matchday or month.
- **Goals conceded** throughout the season: Y-axis corresponding to goals conceded and the X-axis corresponding to the Matchday or month.
- **Transfers**: number of players that have been transferred in on the Y-axis and the months/ seasons that these transfers have happened.

Players:

- **Goals** the player has scored (by season): Y-axis will be the number of goals and the X-axis will be the matchday/month/season.
- **Assists** the player has made (by season): Y-axis will be the number of assists and the X-axis will be the matchday/month/season.

- **Fouls made**: The number of fouls a player has made and the number of fouls they have drawn.

API 3:

Project Name: Air Quality API v2

Description of API

This API will garner a data set that outlines the air quality in different regions of the world as well as the current conditions in said region (pollutants, indexes) and health recommendations based on the data given. With this data set users can compare the air quality in different regions.

Outline of Dataset Characteristics

Outline the properties of your objects. List and describe your object property list.

This API will give us the following dataset:

- Current conditions these are the current air conditions of the specified location:
    - Air quality index: 0-100 this indicates the level of pollution, the closer that index is to 100 the better the air quality is in that area.
    - Colour: depending on the AQI a colour is given which indicated the level of pollution
    - Category: "good", "bad" etc., this is a quality category which is again dependent on the AQI.
    - Dominant pollutant: this is a chemical formula for the pollutant that is primarily in the specified location.
- Detailed pollutant classification (up to 8 pollutants are given):
    - This will detail the specific level of the pollutant in that area (0-100 scale) and whether the pollutant is accounting for good or bad air quality
    - Concentration: the concentration of that pollutant in the area and the unit of measurement it is in
- Hourly forecast: This shows the hourly air quality of a specific area this includes (+- 4 days):
    - Hourly air quality indexes
    - Pollutant data
    - Health recommendations

Outline of comparative data

List the properties that you will use for the comparison page to attain full functionality as outlined in the brief.

Users will be able to select a region/ country they would like to compare and look at the following data:

- AQI of that country currently
- The dominant pollutant and it's:
    - Index
    - Concentration
- An estimated AQI rating for the next few days

Outline of timeline data

Outline the characteristics of your dataset that you will use for the timeline page.

The timeline page will be used to highlight:

- AQI rating of a region currently and it's hourly rate
- The next 4 days predicted AQI rating.
- The past 4 days predicted AQI rating.
- The dominant pollutant previous, current and predicted future AQI rating.
- The various AQI ratings of the current pollutants.
- The various concentrations of the current pollutants in that region.