Top Billboard Music

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Music Billboard Dataset

Billboard

- URL
- Week ID
- Week Position
- Song (the title)
- Performer
- Song ID
- Instance (we were not able to identify the definition)
- Previous Week Position
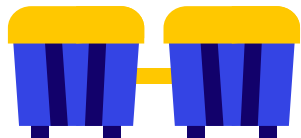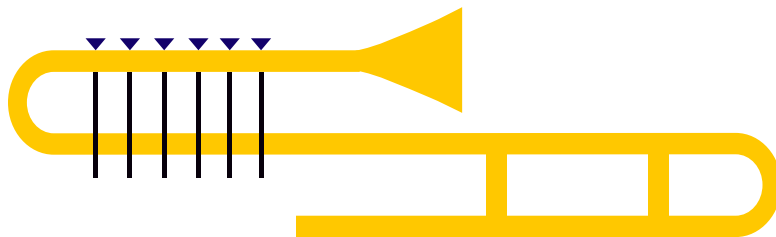- Peak position
- Weeks on Chart

Spotify

- Song ID
- Spotify Track ID
- Artist Genre
- Spotify Track Duration MS (per millisecond)
- Spotify Track Popularity
- Danceability
- Energy
- Key
- Loudness
- Mode
- Speechiness
- Acousticness
- Instrumentalness
- Liveness
- Valence
- Tempo
- Time Signature
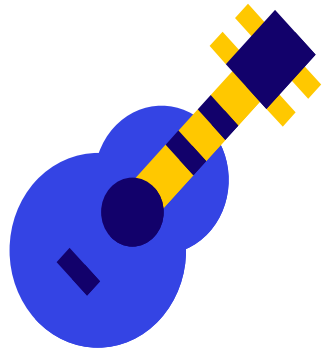
Merged Data

- We combined the datasets and cleaned the NaN entries.

- When looking at the datasets, we chose to investigate what traits (danceability, energy, etc) impact song popularity the most, choosing to focus on the year 2019.

- Basically, if someone wanted to make a successful song, what factors would they make sure to take into account?

Traits Analysis – Danceability

- Hypothesis: Songs with high "danceability" are more popular.
- Investigation: Using a scatter plot, and correlation we compared danceability to peak position on the chart.
- Analysis: Based on appearance of the graph as well as calculated correlation, -0.076, there does not appear to be much correlation between the danceability and peak chart position.
- So what trait (if any) *does* affect song popularity?
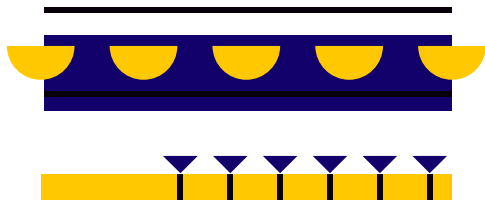
Danceability (x) vs Peak Position (y)
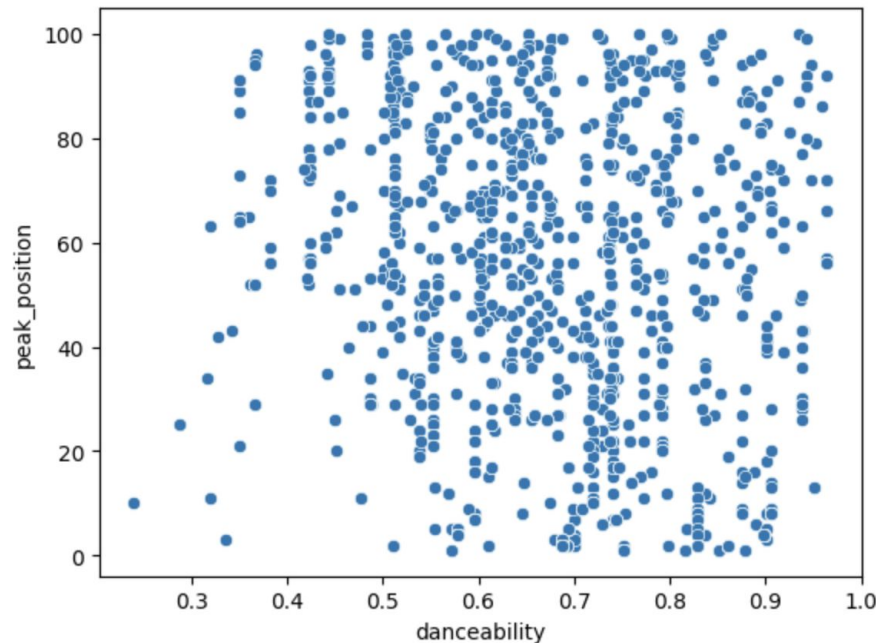
Traits – Duration
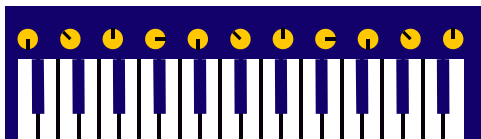
- We started with testing how the duration of a song relates to its popularity, defined by both weeks on the chart and peak position.
- Hypothesis: People prefer songs that range from 3 to 5 minutes in length
- Analysis: For weeks on chart, the calculated correlation was 0.088. For peak position, we calculated -0.048. Both of these correlation were too small to show any significance, thus we decided there isn't much of a relation between the popularity and duration of a song.
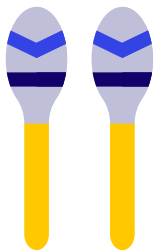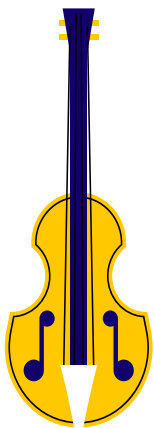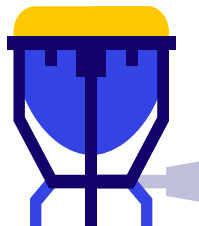
Duration (x) vs. Peak Position (y)
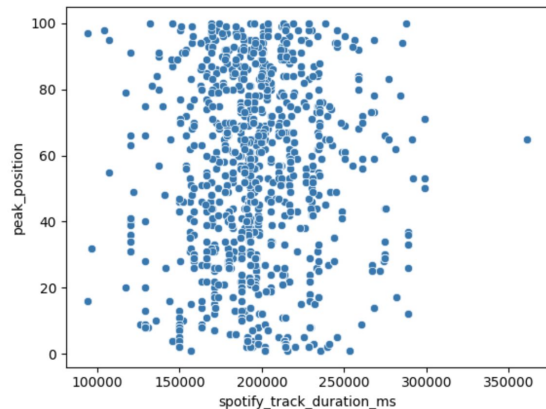
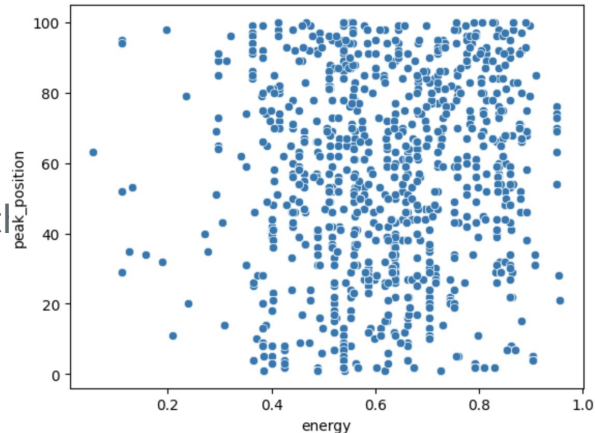

Duration (x) vs. Weeks on Chart (y)
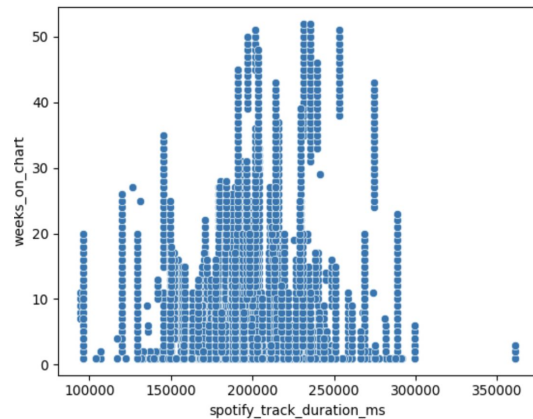
Traits – Energy

- Next, we tested the association of the energy of a song with it's popularity regarding both weeks on chart and peak position.
- Hypothesis: People like more upbeat, energetic songs.
- Analysis: The correlation for peak position was 0.007, and the correlation of weeks on chart was 0.069, so we classified energy as irrelevant when in comes to song popularity.
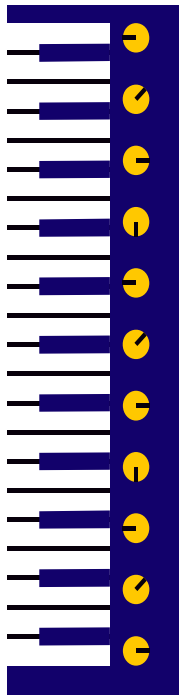

Energy (x) vs. Peak Position (y)
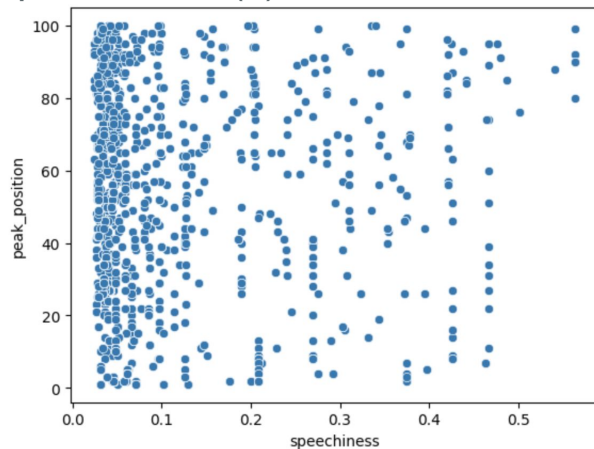

Energy (x) vs. Weeks on Chart (y)
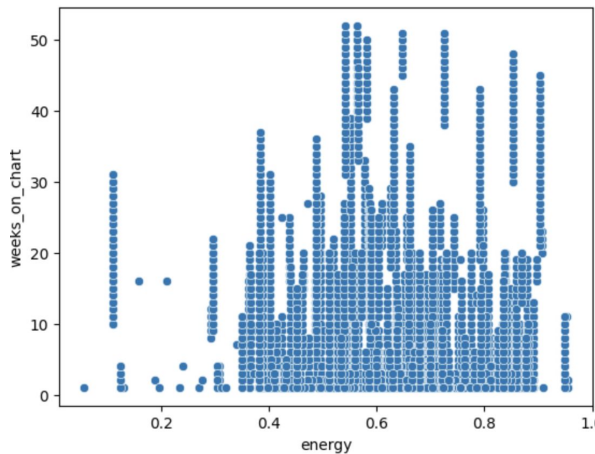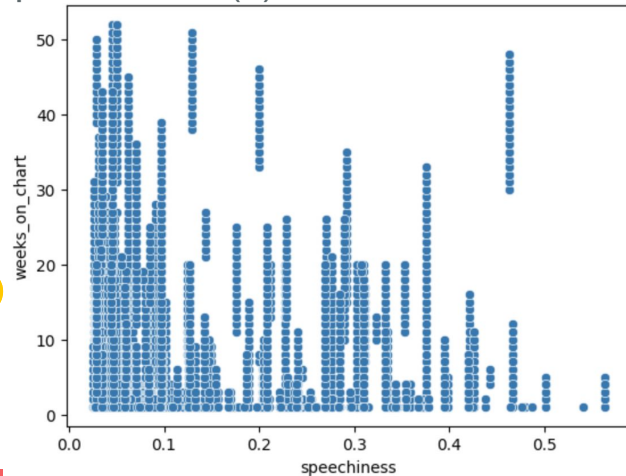
Traits – Speechiness

- We compared the relation between song popularity and speechiness of aa song for both peak position and weeks on chart.
- Hypothesis: People tend to enjoy music with less words more.
- Analysis: The correlation for peak position was -0.004, and the correlation for weeks on chart was 0.029. Although the correlations were very small, by looking at the graphs, we realized the were more songs that had a lower speechiness in general.

Speechiness (x) vs. Peak Position (y)

Speechiness (x) vs. Weeks on Chart (y)

Instrumentalness (x) vs. Peak Position (y)

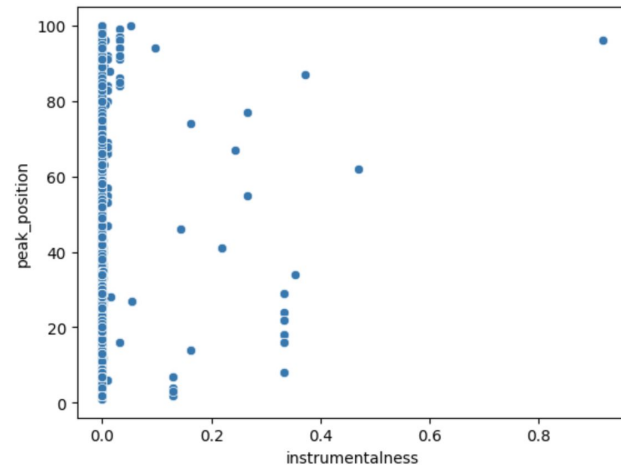Instrumentalness (x) vs. Weeks on Chart (y)
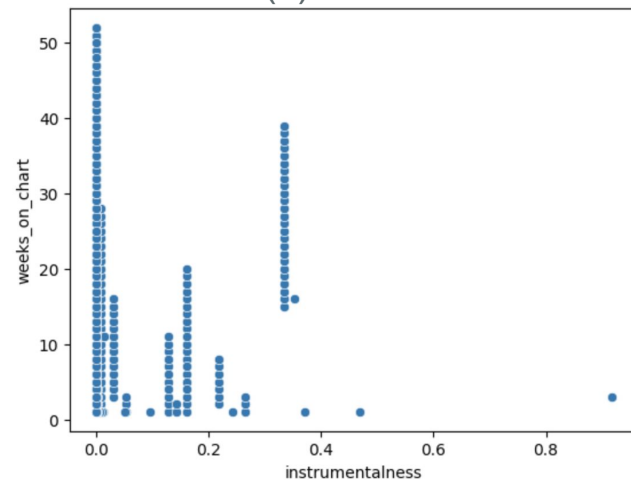
Traits – Instrumentalness

- To go along with speechiness, we also tested the relation between instrumentalism and song popularity.
- Hypothesis: People listen to songs with more instruments.
- Analysis: The correlation for peak position was 0.033, while the correlation for weeks on chart was -0.042. Although both correlation were very small, the graphs showed us that there were more songs with less instrumentalness in general.

Conclusion

- Findings:
    - Some traits appeared to be slightly correlated, but we did not find any one specific trait that had major influence on the popularity of songs.
- Limitations
    - Counterintuitively, using such a large dataset
    - Time
- Reflection
    - We learned many coding and data analysis skills.
    - We already have ideas of where we could learn and practice more.
    - One question we came up with for future research: When songs have very low amount of a certain trait–is it because those weren't made or weren't popular enough to be on the chart?
    - There is no magic formula for music success!