The Perfect Trumpet Recital, According to Data

By Dashiell Kwan

October, 2025

GitHub Link

Introduction

Have you ever attempted to construct a solo recital for yourself? Maybe you are a soloist, a high school student, a college student like myself, or just someone who dreams of performing a solo recital. One of the most commonly asked questions at music school is “when is your recital” which is then followed by “what will you play at your recital?” I know this feeling well because I’m in the middle of constructing my own junior trumpet recital.

To those of us who are wind and brass players, we know that we cannot go on forever. As a brass player, those recitals are even shorter than the woodwinds. 90 minutes tops. Some might say “why don’t you build up your stamina?” The truth is, a solo brass piece requires significantly more playing time than any other large ensemble piece for a brass part. We just aren’t built to play endless programs, which is honestly better for the audience. So, as a student studying Trumpet Performance and Information/Data Analysis, I decided to take matters into my own hands.

Spotify offers a feature called “Spotify for Developers”, which is a free API that allows programmers to retrieve data about their own Spotify profile, and all other songs in the database. Spotify used to offer a more in-depth analysis of their data, providing audio features for all of their songs such as “energy”, “danceability”, “tempo”, “happiness” all for free. As of November 2024, they deprecated this feature and forced programmers to search for this data elsewhere. I was able to use RapidAPI to retrieve a very close alternative to Spotify’s own data, though I do not know how accurate it is to the original dataset. Despite these uncertainties, I used RapiAPI’s data and included my own knowledge of music and the trumpet repertoire to assess what was right and wrong, and began developing the “perfect” trumpet program.

The Data

Trumpet repertoire is categorized by difficulty based on what year in your career you should be expected to play the piece. When looking for my own solo repertoire, I found myself often checking a PDF named “Trumpet rep all years” on TrumpetJourney. On this master document, headers indicate skill levels, such as High School, College Freshman, and all the way up to Graduate Student. As a trumpet student, I assessed this document and decided that it was very trustworthy in terms of its difficulties, and useful as there are over 700 entries on this document. From here, I converted the PDF to a text file, created a massive JSON file that separated each entry with their composer and piece title. If my program recognized a proper composer name and piece name, the JSON entry would look like this (see below).

Otherwise, it might be an empty entry, in which I ignored the null values all together.

```
            "composer": "_____, ",
            "pieces": [
                "An Elizabethan Songbook"
            ]
        },
        {
            "composer": " ",
            "pieces": []
        },
```

From here, I read every entry as “composer, piece”, and kept track of how many times each piece by that specific composer appeared on the list. I specified the composer, as I knew there would be multiple entries with the same name but a different composer, which will soon be mentioned. I wanted to keep track of which pieces kept showing up on the document, no matter the difficulty. I also wanted to see which pieces showed up in more than just the “standard rep”, as there were several subheaders such as “short pieces” or their musical period. The result was another large text file that looked like this:

composer_piece_counts.txt

```
Copland, Quiet City, Count: 28
Curnow, Concert Piece, Count: 28
Bloch, Proclamation, Count: 24
Plog, Animal Ditties, Count: 24
Kail, Variations in F, Count: 24
Kreutzer, Variations, Count: 24
Weber, F. D. Variations in F, Count: 24
Haydn, Concerto in E-flat, Count: 24
Llewellyn, My Regards, Count: 24
Goedicke, Concert Etude, Count: 24
Broughton, Excursions, Count: 24
Hovhaness, Haroutiun, Count: 24
Bernstein, Rondo for Lifey, Count: 20
Arnold, Fantasy, Count: 20
Purcell, Sonata, Count: 20
Viviani, Sonata, Count: 20
Arutunian, Theme and Variations, Count: 16
Arutunian, Concert Scherzo, Count: 16
Bennett, Rose Variations, Count: 16
Berghmanns, La Chenille, Count: 16
Bozza, Caprice, Count: 16
Bozza, Rustiques, Count: 16
Broughton, Oliver’s Birthday, Count: 16
Chance, Credo, Count: 16
Enesco, Legend, Count: 16
```

Now, here I must address a few biases that followed as I proceeded with my analysis. I ruled out pieces that had separate movements/variations that were often recorded separately. So this meant pieces like “Animal Ditties” by Plog, and the Kail and Kreutzer Variations. However, there were some cases where I

decided to keep specific movements from a concerto or sonata, if I knew for certain that there was one movement that was more popular than the others. These two are not pictures in the excerpt, but I included the first movement of Oskar Bohme's Concerto in F Minor, and the third movement of Hummel's Concerto in Eb Major, because I was certain that those movements were more popular than the others. Since the Haydn trumpet concerto is overall extremely famous, I could not choose one movement to focus on, so I did not include the Haydn at all. In addition, once I got into the sea of pieces with a count of 16, I hand picked songs myself. The songs with the most appearances are "Quiet City" and "Concert Piece" with 28, and the cutoff was 16 appearances, which spans from Bozza's "Caprice" to Hindemith. The final list and their Spotify references:

Aaron Copland's "Quiet City", James Curnow's "Concert Piece", Ernest Bloch's "Proclamation" for Trumpet, F.D. Weber's "Variations for Trumpet", Edward Llewlyn's "My Regards", Alexander Goedicke's "Concert Etude", Bruce Broughton's "Excursions", Alan Hovhaness's "Aria from Haroutin", Leonard Bernstein's "Rondo for Lifey", Eugene Bozza's "Caprice" and Eugene Bozza's "Rustiques", George Enesco's "Legende", Joseph Turrin's "Caprice", the first movement from Oskar Bohme's "Trumpet Concerto in F Minor", the third movement from Johann Nepomuk Hummel's "Trumpet Concerto in Eb Major", Alexander Arutunian's "Trumpet Concerto" and the first movement from Paul Hindemith's "Sonata for Trumpet".

For my own sake, I have played a few of these pieces: Concert Etude, Rondo for Lifey, both Caprices, Rustiques, Legende, Bohme, Hummel, and Arutunian.

The Process

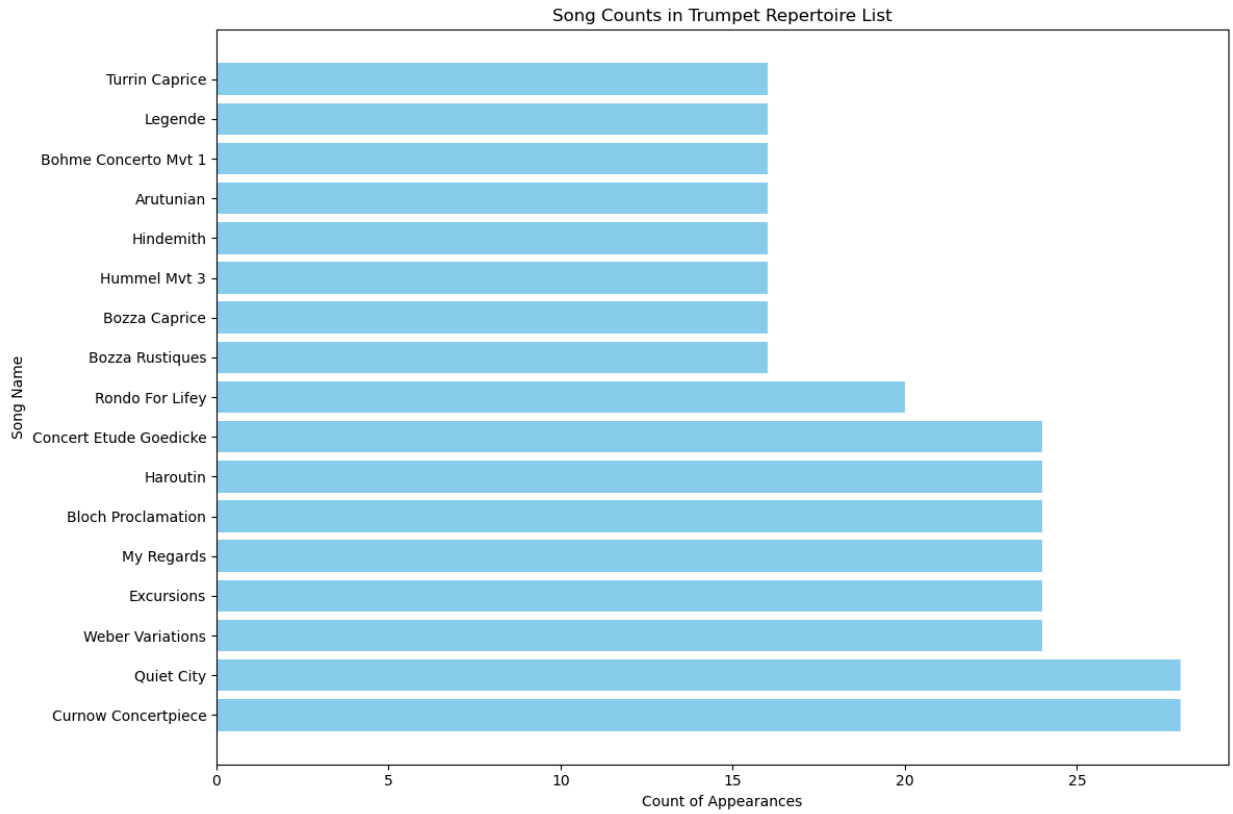
I have a list of 17 of the most popular trumpet solo pieces. So what? This is where the fun begins. What was my initial goal again? I want to create the *perfect* recital, according to data. I want popular pieces that people know, pieces that won't put people to sleep, and pieces that keep the recital at an appropriate runtime. The last thing you want as an audience member is an endless program of pieces you have never heard before.

The Spotify/RapidAPI data returns audio features in the form of a JSON file, so I needed to get the audio features for all of these songs. I wrote a function that would get each Spotify track ID from the URL, and collect its data to store in a large JSON file. I ended up with data that looked like this:

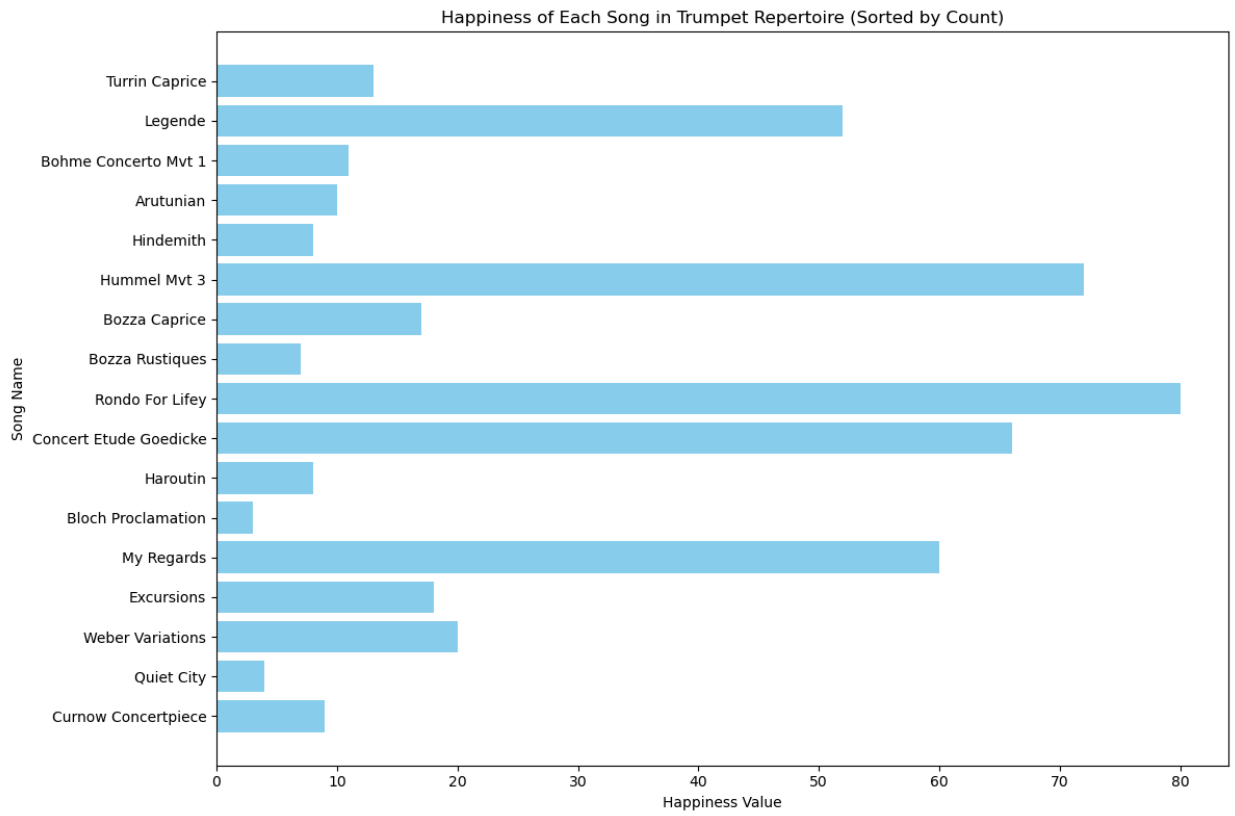

```
{
    "song": "Quiet City",
    "track_id": "1KzYyr0CWap4Yudesoycyh",
    "data": {
        "count": "28",
        "id": "9d98470356d4f4d99042b4066813bcd7",
        "key": "F",
        "mode": "major",
        "camelot": "7B",
        "tempo": 72,
        "duration": "9:17",
        "popularity": 25,
        "energy": 3,
        "danceability": 13,
        "happiness": 4,
        "acousticness": 97,
        "instrumentalness": 71,
        "liveness": 8,
        "speechiness": 5,
        "loudness": "-23 dB"
    }
},
```

Immediately, I can disregard several features of the collected data. For one, “speechiness” is referring to how many words appear in the song, and considering these are all fully trumpet pieces I’m surprised any of them scored above a 0. In addition, the popularity scores for all of these are low because most of these pieces have under 100,00 streams. And finally, I ignore “tempo” and “key” because these pieces often change keys and tempos several times. This does affect important features that I do use, though.

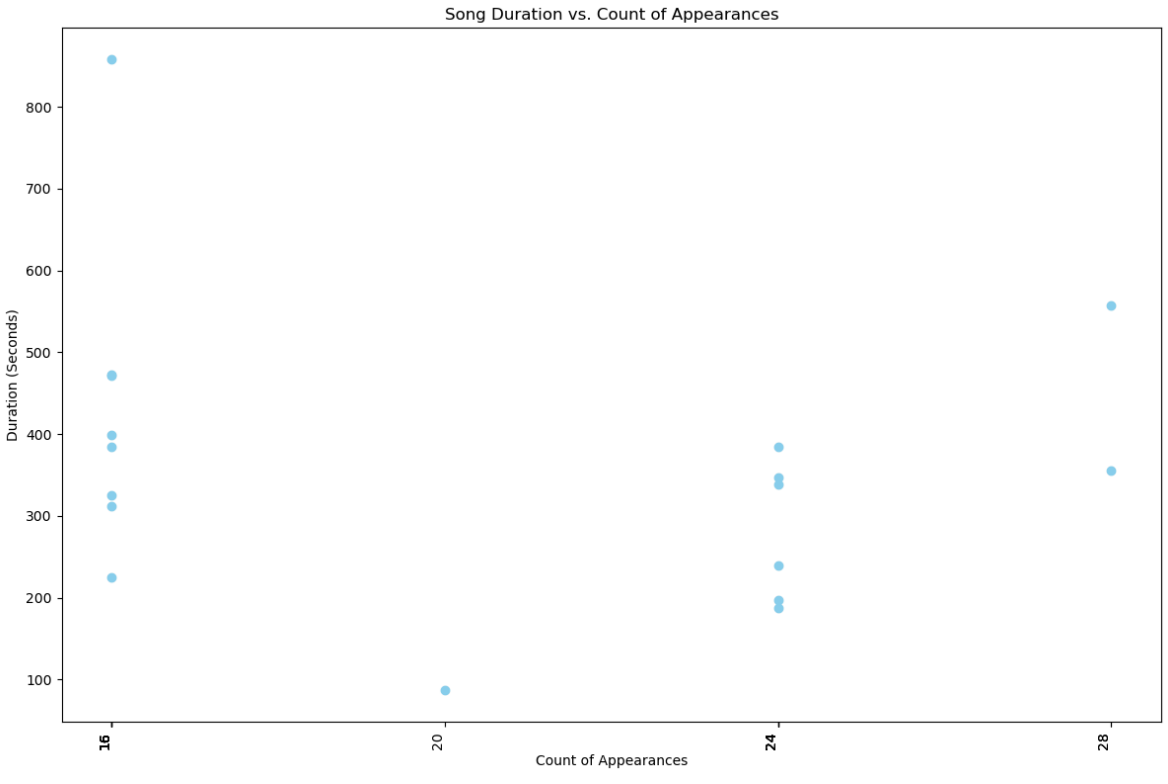
To make information more clear, I created a bar plot of each song on my list and how many times it appears on the document.



Now that I have sorted my selected entries by their popularity, how can I use their individual data to construct an effective solo recital? As I mentioned before, one of the worst things you can do to your audience is put them to sleep, or leave them unsatisfied. Seeing that the Spotify API provides a pretty accurate “happiness” index, which I assume is calculated by energy, audio levels, tempo, etc., I wanted to see which of these songs had a higher “happiness” index and how many times it appears on the sheet.

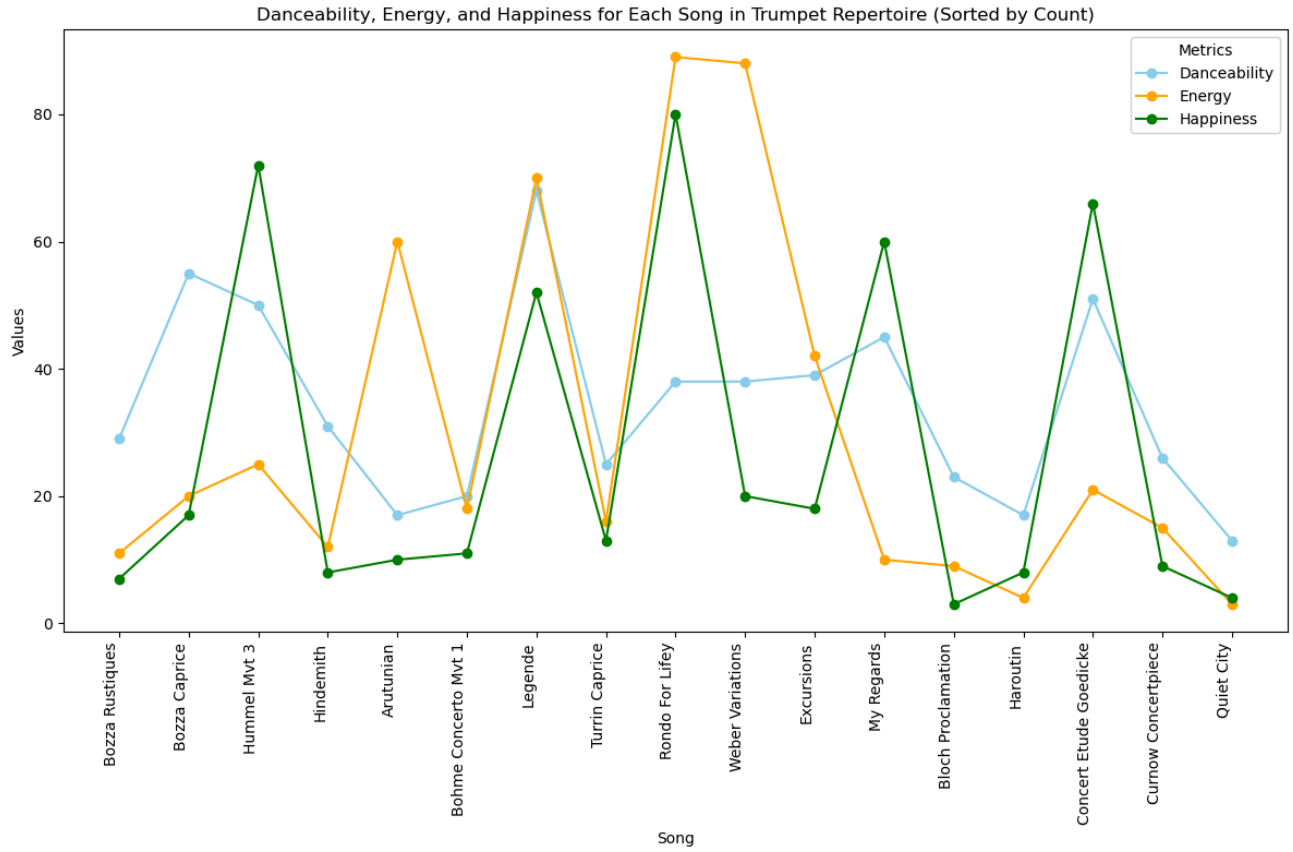


Keeping the original order of pieces, so that the songs on the bottom are the most popular, we can see that the “happier” songs seem to be in the middle. So they are popular, sure, but not the most popular. After creating this graph, I wanted to see if the median counts told me more about that data than max and mins. I converted each duration to seconds and looked for the durations of each song for their count.

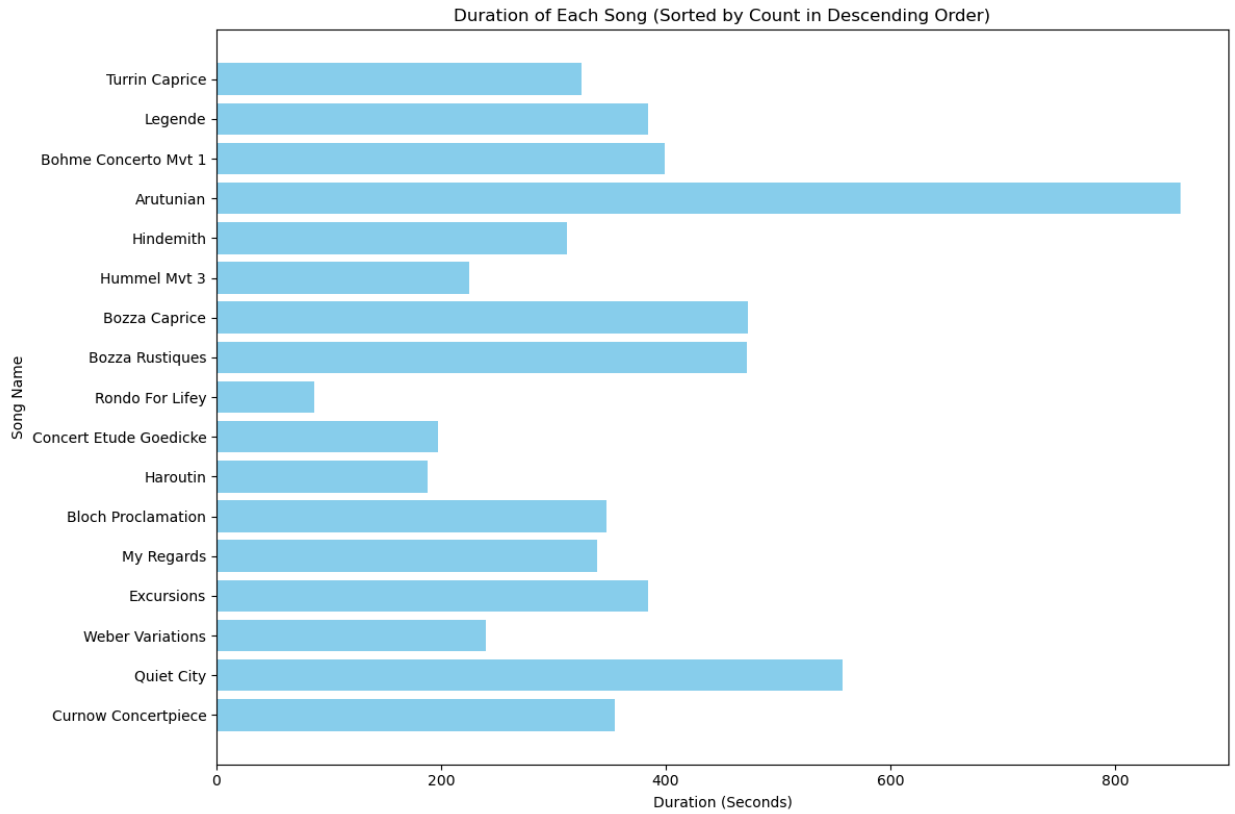


Besides the one outlier being “Rondo For Lifey” (20 counts, 97 second duration), it seems that duration is a good indicator of a good piece for your program. For the songs that appear 24 times, the shortest is 200 seconds and the longest is about 400 seconds. That’s only a range of 3:20 - 6:40 minutes, which is easily digestible. I mainly wanted to zoom in on duration because I wanted to see if the songs towards the median were shorter or longer, since those songs are also happier. And from the graph above, we can see that the shorter songs are happier.

Curious to further investigate the API data, I focused on some of the Spotify metrics: “danceability”, “energy”, and of course, “happiness”. Danceability is a metric that Spotify created which favors more consistent tempos. Pieces that have fluctuating tempos will likely have a lower score, which is many solo trumpet pieces. However, since I am looking to create a crowd pleasing recital program, I *want* danceable songs, don’t I? Here’s a graph of all the pieces and their respective information.



Interestingly, the “happiness” score is not always aligned with “energy” and “danceability”. How could that be? Well, it all depends on Spotify’s models. How they calculate each of these metrics is in their system, but I assume that they are different because energy and danceability are centered on tempo, while happiness can be from timbre, musical register, and volume. From this, I decided that the specific audio feature that could be most valuable to my conclusion would be “happiness”, and the “happiest” pieces are Hummel, “Legende” (surprisingly, I’ll get to that later), “Rondo for Lifey”, “My Regards”, and “Concert Etude”. So that I can stay true to my goal of a crowd pleasing program with a reasonable length, the final variable I need to investigate is each song’s duration. Converting each song’s duration to seconds, I produced this graph:



The one outlier in this dataset is the Arutunian Trumpet Concerto, as it is always played without pause, so that makes its length significantly longer than any other piece on the list. I chose that the shortest songs could be those with a duration less than 400 seconds, so this includes “Rondo for Lifey”, “Haroutin”, “Concert Etude”, Hummel, Weber “Variations”, Curnow “Concert Piece”, “My Regards”, Bloch “Proclamations”, Hindemith, and Turrin’s “Caprice”.

By my own analysis, the overlap between shortest and happiest pieces highlights four pieces: “Rondo”, “Concert Etude”, Hummel, and “My Regards”. Because I feel that a four piece program that will run approximately 16 minutes is far too short, I decided to add in Weber’s “Variations”, as it is one of the shorter pieces that also has the second highest energy level (second to “Rondo”). Why did I do this? Considering that “Rondo” seems to fit all of our criteria for a perfect selection on the program, I figured that the next most energizing piece would be an appropriate choice as well.

Biases (Before Conclusion)

Before I conclude my report, I must address several biases and potentially impactful variables to this analysis. As initially stated, I have included my own personal biases being a trumpet player. I could have selected a different source to collect my data from, perhaps there are other datasets out there that address

this issue, or there might be a more definitive way of calculating the most popular trumpet pieces. However, I chose a source that I trusted and decided was useful and concise.

Another bias that you may have noticed is that the audio features data is strictly determined by the performance of the piece, not the piece itself. This is why I carefully chose each recording, I wanted the most popular recording on Spotify so that recording could best represent the piece. As instrumental music is particularly interpretive, no recordings will be the same, so not every "energy" or "happiness" level will match. For the sake of this experiment, I considered those biases by ignoring features that may be specifically subjective suc has popularity, as that is calculated based on that certain track's popularity among all of Spotify. Since I did factor in several other subjective features such as happiness, it still makes the analysis a bit biased but I took a lot of this information with a grain of salt, it is purely for my own research.

Conclusion

What did I calculate? I took the 17 most popular solo trumpet pieces according to TrumpetJourney, read their information and developed my own scale for what would define an enjoyable program. I created a list of five pieces that were among the shortest pieces (recording less than 400 seconds), the highest of the happiness index, and sometimes a high energy score. The program:

Leonard Bernstein, "Rondo for Lifey" (Count: 20, Duration: 1:27, Happiness: 80, Energy: 89)
Alexander Goedicke, "Concert Etude" (Count: 24, Duration: 3:17, Happiness: 66, Energy: 21)
Johann Nepomuk Hummel, "Trumpet Concerto in Eb Major Movement III" (Count: 16, Duration: 3:45, Happiness: 72, Energy: 25)
Edward Llewlyn, "My Regards" (Count: 24, Duration: 5:39, Happiness: 60, Energy: 10)
F.D. Weber, "Variations for Trumpet" (Count: 24, Duration: 9:29, Happiness: 20, Energy: 88)

As I stated in my intro, trumpet players can't play for extremely long periods, which is why our solo repertoire may seem short. Fortunately for us, the most popular repertoire also happens to be among the shortest. This recital I have put together will be clocking 23 minutes and 47 seconds (with some breaks included this would be about a 30 minute recital). Surprising? I think this would definitely be an enjoyable recital.

As a bonus, I have an upcoming junior recital where I will be playing at least 3 pieces, one of them being Bozza's "Caprice" (mentioned in this project). The final step in proving my experiment would be to try out the program, perhaps I can try next year as a senior.