

To get a better understanding of the features and what they represent, I sorted the above playlist using different features. Sorting the songs by liveness revealed that most tracks have low values, except for “Great Balls Of Fire”, which is a live recording containing a lot of audience interaction (cheers and screams). It was followed by “疲惫的爱” (the Chinese song) , which contains something that sounds like dialogue. The top ten songs are shown in Figure 1. According to Spotify API documentation, a value above 0.8 indicates a strong likelihood that the track is live. Actually, only 1 out of 50 songs is a live. The liveness of all other songs is quite low, agreeing with the expectation.

	danceability	energy	key	loudness	mode	speechiness	acousticness	instrumentalness	liveness
Miles Teller - Great Balls Of Fire - Live	0.562	0.605	9	-7.299	1	0.0421	0.765000	0.000000	0.728
step.jad - 疲惫的爱	0.558	0.558	9	-5.408	1	0.0406	0.636000	0.000000	0.671
Lizzo - Like a Girl	0.694	0.807	2	-3.183	1	0.0888	0.016700	0.000000	0.547
(G)I-DLE - Nxde	0.726	0.910	4	-1.948	0	0.1790	0.041300	0.000008	0.479
Lizzo - Special	0.517	0.707	7	-5.474	1	0.0693	0.016400	0.000000	0.453
Lady Gaga - Alejandro	0.623	0.793	11	-6.630	0	0.0462	0.000397	0.001500	0.375
Amy Winehouse - Rehab	0.407	0.558	0	-13.609	1	0.0552	0.054100	0.000002	0.340
Doja Cat - Streets	0.749	0.463	11	-8.433	1	0.0842	0.210000	0.038200	0.338
TWICE - Talk that Talk	0.772	0.907	3	-2.438	0	0.1240	0.136000	0.000000	0.334
Lady Gaga - Disco Heaven	0.752	0.946	0	-3.398	1	0.0802	0.038800	0.000121	0.312

Figure 1: top 10 liveness songs

Furthermore, high values for energy, danceability, and tempo indicated upbeat and energetic songs, while low values indicated mellow and subdued songs. For example, “Shut Up And Drive” by Rihanna had a high energy and tempo

score (in the top ten of both lists), while "Newsflash!" by NIKI had a low energy score and a slower tempo. It is worth noting that all 50 tracks have quite low values for instrumentalness because all songs have a lot of lyrics. Based on my knowledge of the songs, these results generally felt correct.

Cosine similarity analysis using subsets of features revealed interesting findings. "Nxde" by (G)I-DLE and "Talk That Talk" by TWICE were found to be similar in terms of style and genre (with all 13 features), which is not surprising given that both are K-pop songs. Moreover, "ANTIFRAGILE" by LE SSERAFIM and "BREATHE (Feat. MINO) (Prod. GRAY)" by Anandelight were found to be similar in sound and mood (using energy, acousticness, instrumentalness, and valence as features), which is interesting given that both songs convey positive and encouraging messages. The cosine similarity for the pair is 0.998, very close to 1. "Antifragile", is described as an "Afro-Latin style" pop song with a "heavy" Latin rhythm and conveys the message that difficult times are stimulus for growth and that with this mindset, they will become stronger, while the lyrics of "BREATHE" talk about the importance of taking a break and relaxing from daily life. Both songs are very positive and encouraging.

Overall, these results provide insights into the features from Spotify API and analyzing songs using different subsets of features can provide valuable insights into their characteristics and similarities. By considering the context and

the aspects of similarity that we want to capture, we can select the most appropriate features to use in our analysis. This can be especially helpful for music recommendation systems and for better understanding the preferences of listeners.