

Whatcha Listening To?

Determining Playlist Success

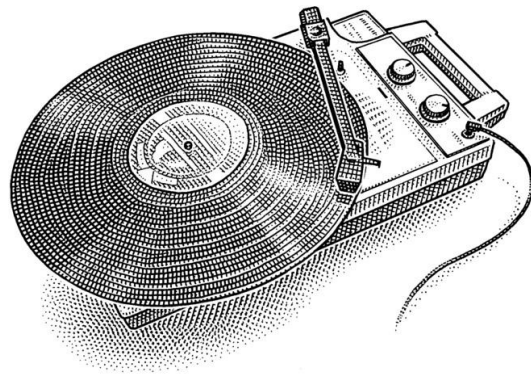
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5/28/21

Upcoming Queue

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Overview: Intro



- Question: What makes a playlist successful?
- Spotify has shared data on **403,366 playlists**
 - A sample of U.S.-based playlists with over 2 monthly active listeners
 - Includes ~400 Spotify editorially curated playlists and ~403,000 user-created playlists
 - Most likely a snapshot of playlists in September (inferred by tokens referencing month)
- Provided summary information on playlist performance & characteristics:
 - engagement (streams, active users on multiple cadences)
 - metadata (# artists, # tracks, genre, title keywords)

Track 1

Data Exploration

Data Exploration

Classified playlists into 18 types based on genre and mood metadata



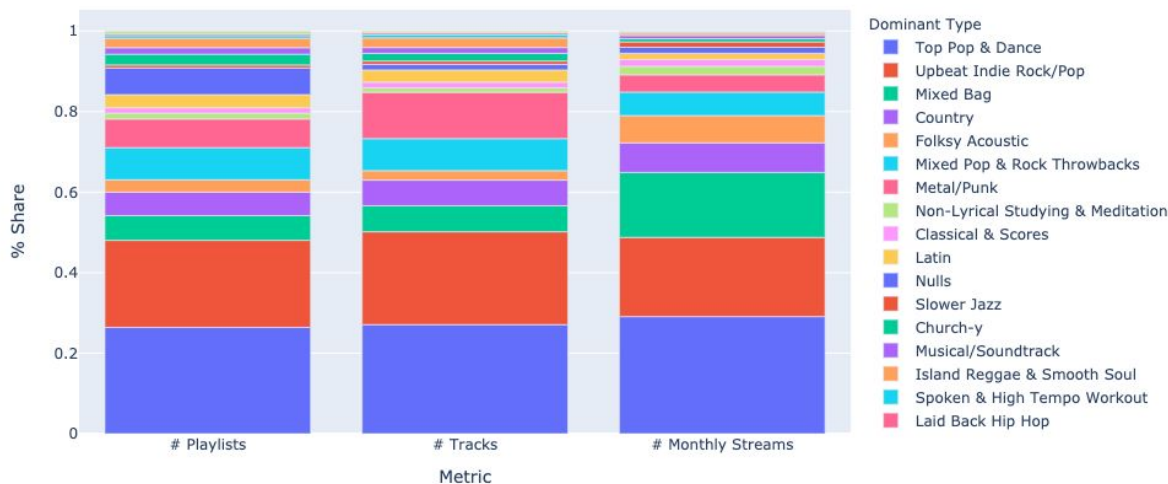
#	Name	% Playlists	Top Example
1	Top Pop & Dance	26.4%	Zoedic - Dance Music
2	Upbeat Indie	21.6%	😡 Your Girlfriend's Mixtape 🎵
3	Mixed Pop & Throwbacks	8.0%	90s
4	Metal/Punk	7.1%	punk goes pop 1-7
5	Mixed Bag	6.1%	80s Smash Hits
6	N/A	6.6%	Pentatonix Complete Playlist
7	Country	5.8%	Country Hits
8	Latin	3.3%	Rancheras
9	Folksy Acoustic	3.1%	Nap time with Beth

#	Name	% Playlists	Top Example
10	Christain	2.7%	TOP PRAISE & WORSHIP
11	Reggae & Smooth Soul	2.4%	Island Hits
12	Musical/Soundtrack	1.6%	Guardians of the Galaxy Mixtape
13	Non-Lyrical Studying	1.5%	Irish Celtic Music
14	Classical & Scores	1.3%	Relive Harry Potter!
15	Slower Jazz	0.7%	Jazz Piano
16	Spoken	0.6%	Best Stand Up Comedy 2014
17	International	0.6%	old school hindi bollywood jams
18	Laid Back Hip Hop	0.5%	90s Hiphop / Gangsta Rap

Data Exploration



- **Dominant categories**, in which the majority of playlists fall into:
 - “Top Pop & Dance”
 - “Upbeat Indie Rock/Pop”
 - “Mixed Bag”
- Categories that makes up a **greater share of streams relative to their inventory size**:
 - “Mixed Bag”
 - “Folksy Acoustic”,
 - “Non-Lyrical Studying & Meditation”



Data Exploration

- *Playlists owned by Spotify have significantly higher reach* than those created by individual users, likely supported by widespread in-app promotion.



Playlist Monthly Active Users



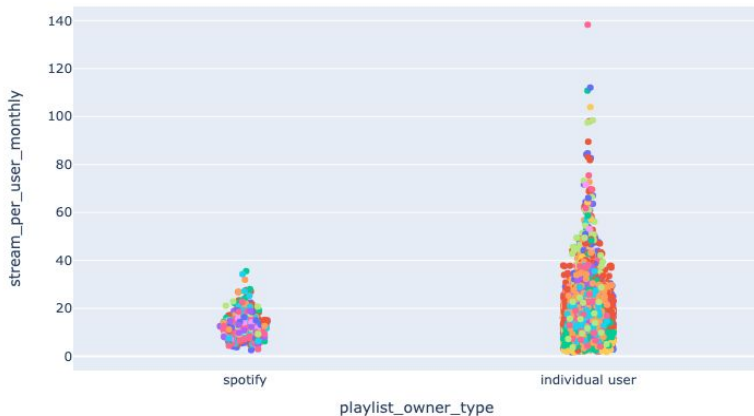
MAU	Spotify	Indv.
Min	2	2
1%	23	2
25%	3,334	2
50%	13,059	2
75%	43,967	4
99%	354,017	128
Max	1,944,150	206,756

Data Exploration



- However, KPIs capturing the importance of these playlists to individual users paints a different story: Spotify playlists no longer seems overwhelmingly dominant
- In many cases, ***user-created playlists seem to be enjoyed by users at a greater rate and with more consistency*** than further-reaching Spotify-curated playlists.

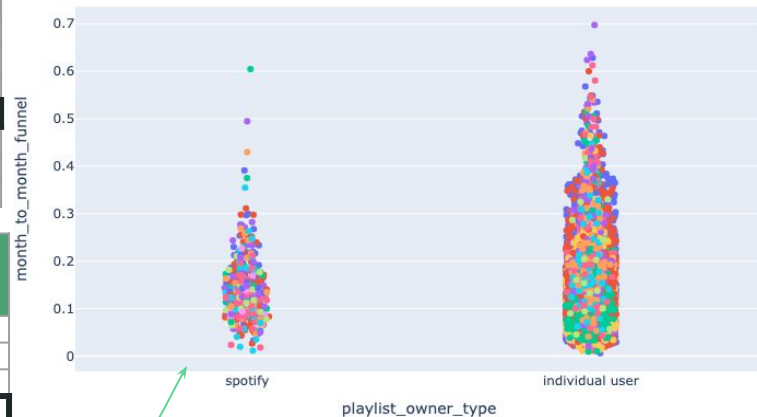
Playlist Streams Per Active (Monthly)



Stream/ Active	Spotify	Indv.
Min	1	1
1%	4	1
25%	9	11
50%	12	24
75%	15	56
99%	27	385
Max	35	12,477

M2M Retention	Spotify	Indv.
Min	1%	1%
1%	3%	3%
25%	10%	10%
50%	13%	14%
75%	17%	20%
99%	38%	47%
Max	60%	69%

Playlist Month-to-Month Retention



Track 2

Defining Success

Defining Success



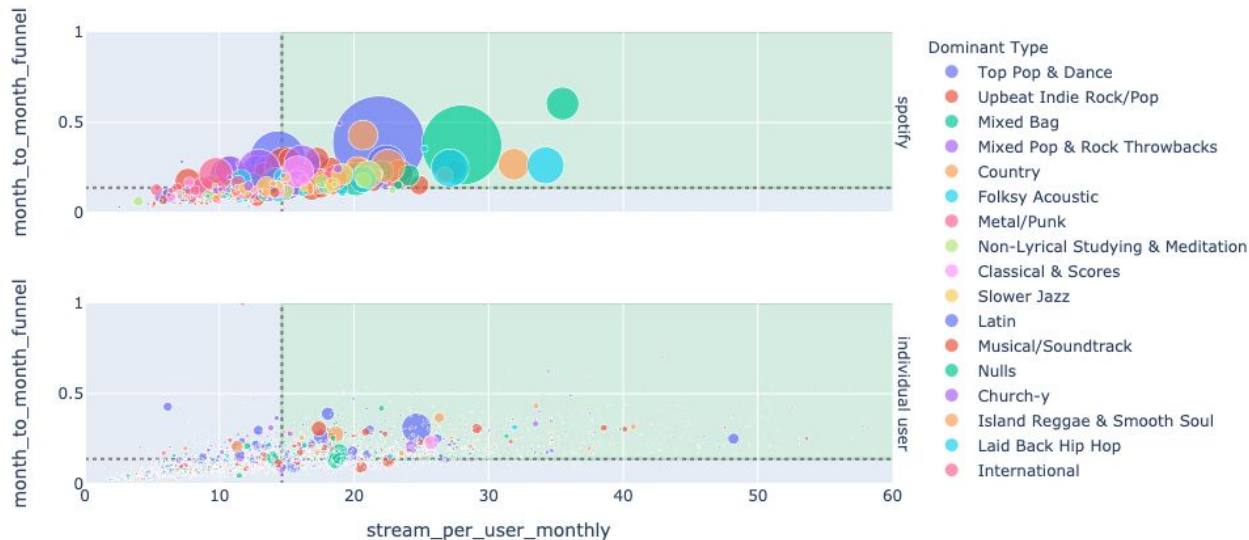
- **Concern:** Traditional measures of success (i.e. Billboard) may be too reliant on popularity rather than fandom
- **Proposal:** Determine criteria for playlist success on multiple features
 - **Popularity** = monthly active users
 - **Frequency** = average monthly streams per user
 - **Consistency** = % month-to-month audience retention

Defining Success



- **Proposal:** Within broadly popular playlist (>128 mau), playlist **success is based on above-median user frequency** (>14.6 streams/active) **& consistency** (>13.9% month-to-month retention)

Monthly Success



Success	Spotify	Indv.
Y	91 (23.4%)	1,564 (38.7%)
N	298 (76.6%)	2,475 (61.3%)

Defining Success



- The rate of success within each category and the highest ranked individual owned playlist as an opportunity for additional promotion

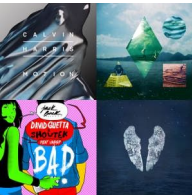
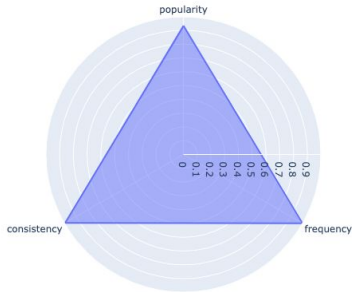

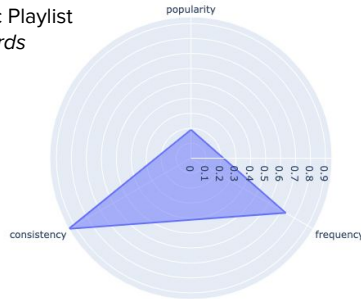

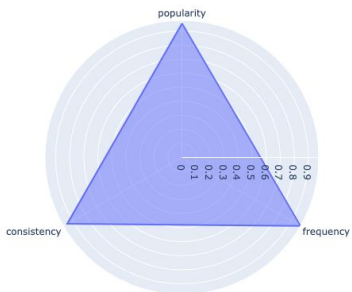

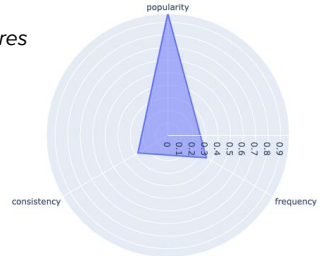
#	Category	% Success	Top User Playlist
1	Top Pop & Dance	34.7%	JoshOG
2	Upbeat Indie	42.7%	Mumford/Lumineers/Of Monsters and Men/Avett Br.
3	Mixed Pop & Throwbacks	33.7%	Mandopop 華語流行音樂
4	Metal/Punk	40.7%	Cleansed Ultimate Playlist :)
5	Mixed Bag	33.7%	will
6	N/A	23.2%	one direction + 5sos
7	Country	46.8%	New Country
8	Latin	39.2%	Románticas
9	Folksy Acoustic	37.2%	Nap time with Beth

#	Category	% Success	Top User Playlist
10	Christain	70.6%	TOP PRAISE & WORSHIP
11	Reggae & Smooth Soul	56.8%	Neo-Soul Essentials
12	Musical/Soundtrack	19.1%	Guardians of the Galaxy Mixtape
13	Non-Lyrical Studying	39.0%	epic study music
14	Classical & Scores	37.0%	Thumos
15	Slower Jazz	46.2%	Jazz Piano
16	Spoken	44.4%	Best Stand Up Comedy 2014
17	International	55.8%	New Naija Nigerian Mix
18	Laid Back Hip Hop	44.4%	Nujabes DJ Okawari DJ Ezasscul

Defining Success



Playlist radar plots can provide context for each playlist's strengths in terms of our three success criteria: popularity, frequency & consistency

Category	Strong for All Criteria	Varying Criteria Performance
Top Pop & Dance	<p>JoshOG user: <i>theoriginalweed</i></p>  	<p>The Essential Electronic Playlist user: <i>Casablanca Records</i></p>  
Non-Lyrical Studying & Meditation	<p>epic study music user: <i>Michael Liu</i></p>  	<p>Meditation user: <i>Mohammad Modarres</i></p>  

Track 3

Predicting Success

Predicting Success



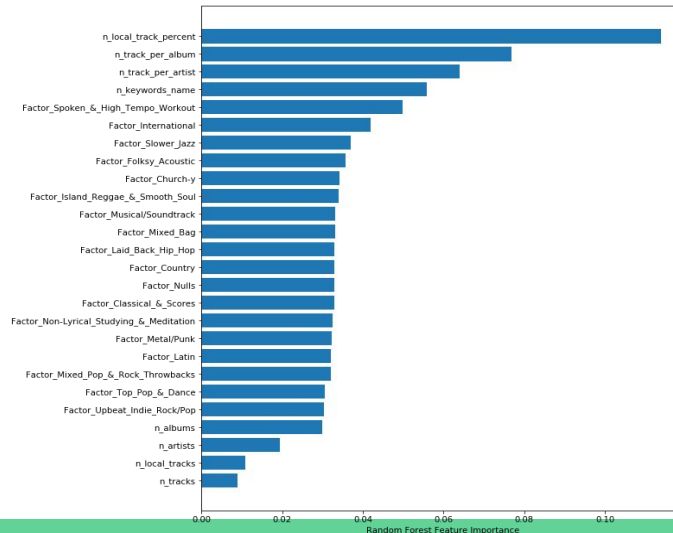
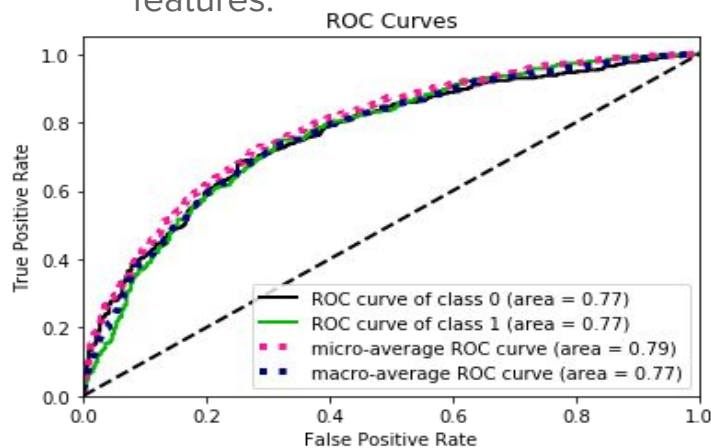
- **Question:** Can we determine key components associated with a successful playlist with available metadata?
- **Approach:** Random Forest Classifier
- **Target:** Success Flag (= 1 if > median stream_per_user_monthly & > median month_to_month_funnel)
- **Features:**
 - Provided features: n_albums, n_artists, n_tracks, n_local_tracks
 - Calculated features:
 - Genre Factors (referenced previously “Top Pop & Dance”, “International”, etc)
 - n_local_track_percent = percent change in tracks from yesterday to today
 - n_track_per_album = album diversity (avg tracks per album)
 - n_track_per_artist = artist diversity (avg tracks per artist)
 - n_keywords_name = length of keywords in playlist title (token field)

Predicting Success



- Model Performance:

- KFold(=5) Average Accuracy = 69.0%
- Interpretation: The model does a reasonable job classifying playlists as successful, outperforming random performance by ~20 pp.
- The most important features were ones that captured recency (`n_local_track_percent`) and track diversity across artists/albums and would recommend further iteration including those features.



Outro

Summary

Summary

- The Hits (Key Findings)

- Classification model confirms that playlists with a mix of genres (“Mixed Bag”) overindexes in their share of overall monthly streams (16%) relative to to their representation (6%)
- Spotify-curated playlists outperform in overall reach, but the playing field for all playlists is more level when considering user frequency (streams/user) and consistency (MoM retention) and paints a more obvious picture for satisfied, healthy user engagement
- Random Forest Model confirms the importance of track diversity in classifying successful playlists

- Sophomore Follow-Up (Next Steps)

- Include track level metadata to understand the stylistic-mix within a playlist
 - Help relationship between stylistic cohesion/diversity and playlist success
- Understand the role of this playlist in the context of the user’s overall engagement⁺
 - Share of a users’ monthly streams driven by a given playlist
 - User profile metadata like individual or company, tenure with Spotify
- NLP features based on playlist title
 - suggests a specific context, informal tone, brevity or exhaustive, etc



That's a Wrap!

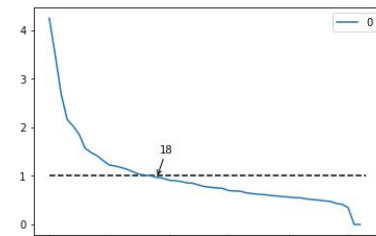
[Github](#)

Liner Notes

Appendix

Classification w/ Factor Analysis

Sample of Determined 18 Playlist Categories w/ EFA



	Latin	Metal/Punk	Non-Lyrical Studying & Meditation	Classical & Scores	Nulls	Country Roots
Genre_Latin	0.760373159	-0.054695659	-0.004262659	-0.052234195	0.052305323	-0.055858398
Mood_Lively	0.633990344	-0.054414807	-0.103833464	-0.004933226	-0.021116956	0.083251716
Mood_Romantic	0.528400176	-0.033245267	0.200681436	0.052487732	0.011139295	-0.063765296
Mood_Urgent	-0.048482818	0.574702807	0.01238428	0.002888235	0.00498237	0.035636358
Genre_Punk	-0.029647575	0.560845324	-0.009946772	-0.001493557	-0.023859892	-0.057275655
Genre_Metal	-0.051294395	0.547854822	-0.016362949	-0.028413805	-0.030885008	0.083735665
Mood_Aggressive	-0.077311716	0.276973708	-0.07540927	-0.04205894	-0.032049081	-0.054680816
Genre_New Age	0.013053749	0.003885243	0.784688032	-0.187162739	-0.041916687	0.028331578
Mood_Peaceful	-0.029205392	-0.021584578	0.551646496	0.155525035	-0.020468457	0.027008067
Mood_Somber	-0.01665106	0.001447112	0.39968756	0.023974319	0.02224067	0.01838706
Genre_Classical	-0.081221235	-0.030465012	0.052502642	0.825990483	-0.007950807	-0.0078695
Mood_Serious	-0.044165715	-0.013806541	-0.018381793	0.464121072	0.010086903	-0.001542704
Mood_Stirring	-0.056652944	0.015736991	-0.069231994	0.433160701	0.025459747	-0.052757939
Genre_Other	0.068615551	-0.009634958	-0.017844501	0.207110265	-0.030847361	-0.025018665
Genre_-	0.104790803	-0.042547116	-0.049492419	0.019443844	1.039061407	-0.022869905
Mood_-	-0.020730203	-0.024317693	-0.00386266	-0.018886477	0.345964841	-0.003447288
Mood_Upbeat	0.045203835	-0.176556513	0.032192712	-0.067656792	-0.007952509	0.558608971
Mood_Rowdy	0.007081406	0.100196132	0.035435554	-0.032877906	0.027916424	0.497230159
Genre_Rock	-0.087816172	0.09738681	-0.0298208	-0.049540479	-0.072842019	0.429028016
Genre_Country & Folk	-0.030645548	-0.133328878	-0.010016679	-0.012664399	-0.066731479	0.383707985