Making Music Recommendations with Spotify Data
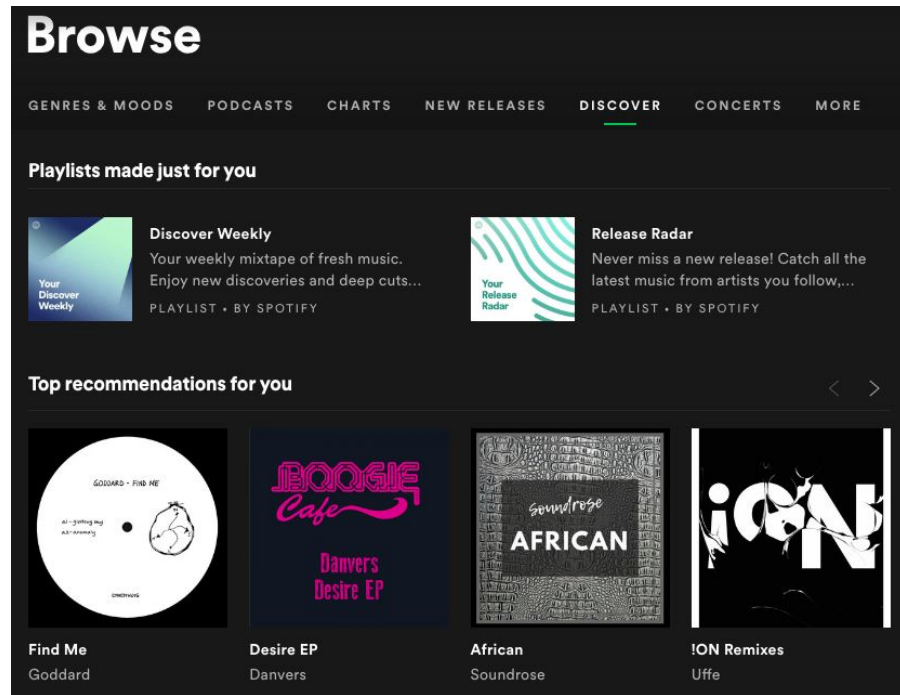
May 2019

Agenda

1) Objectives
2) Motivation
3) Data Overview
4) Key Findings
5) Recommendations
6) Summary/ Next Steps

Objectives

- ❏ Make track recommendations based on track metadata and artist genres
- ❏ Goal to increase long-term user engagement
- ❏ Understand which genres are related
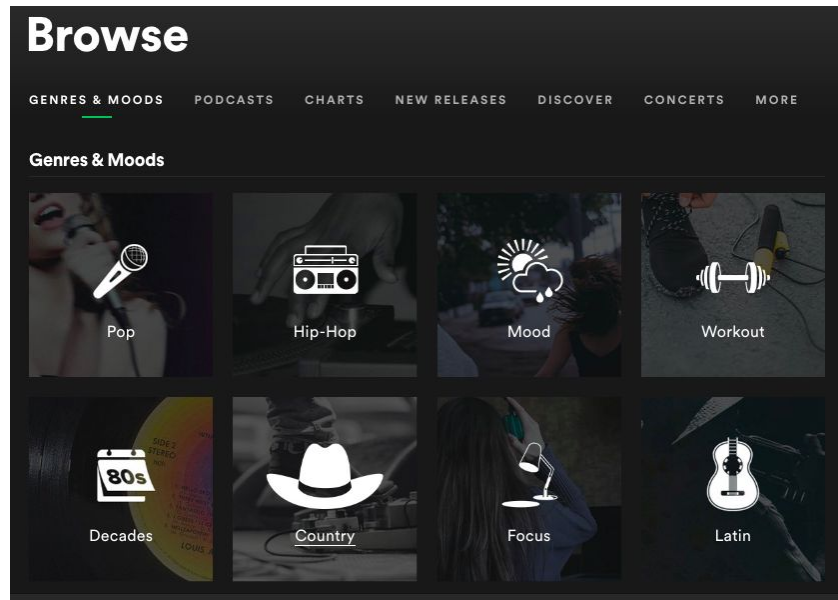- ❏ Understand which playlists are related

Motivation

❏   Hip-Hop head since ever
❏   Started using Spotify in early 2016
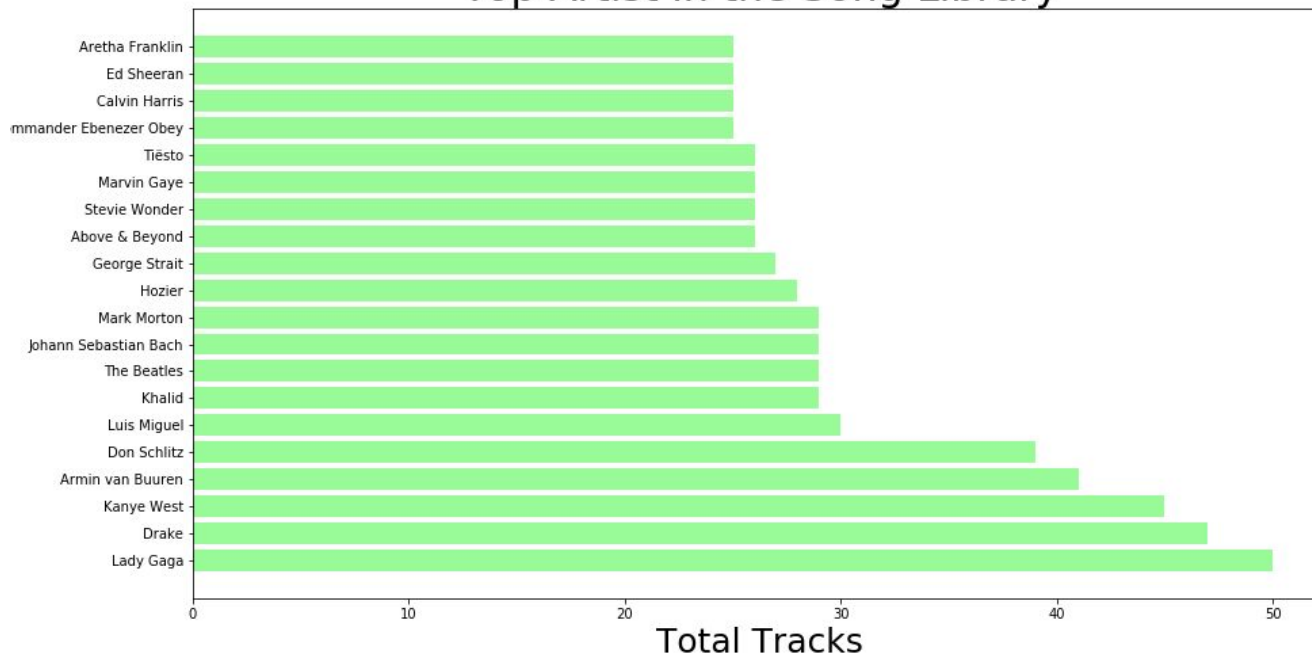❏   Spotify Discover recommendations changed everything..

Data Overview

❏ Collected songs from 750 of Spotify's curated playlists via the Spotipy API

❏ Track audio features including: danceability, tempo, speechiness, etc.
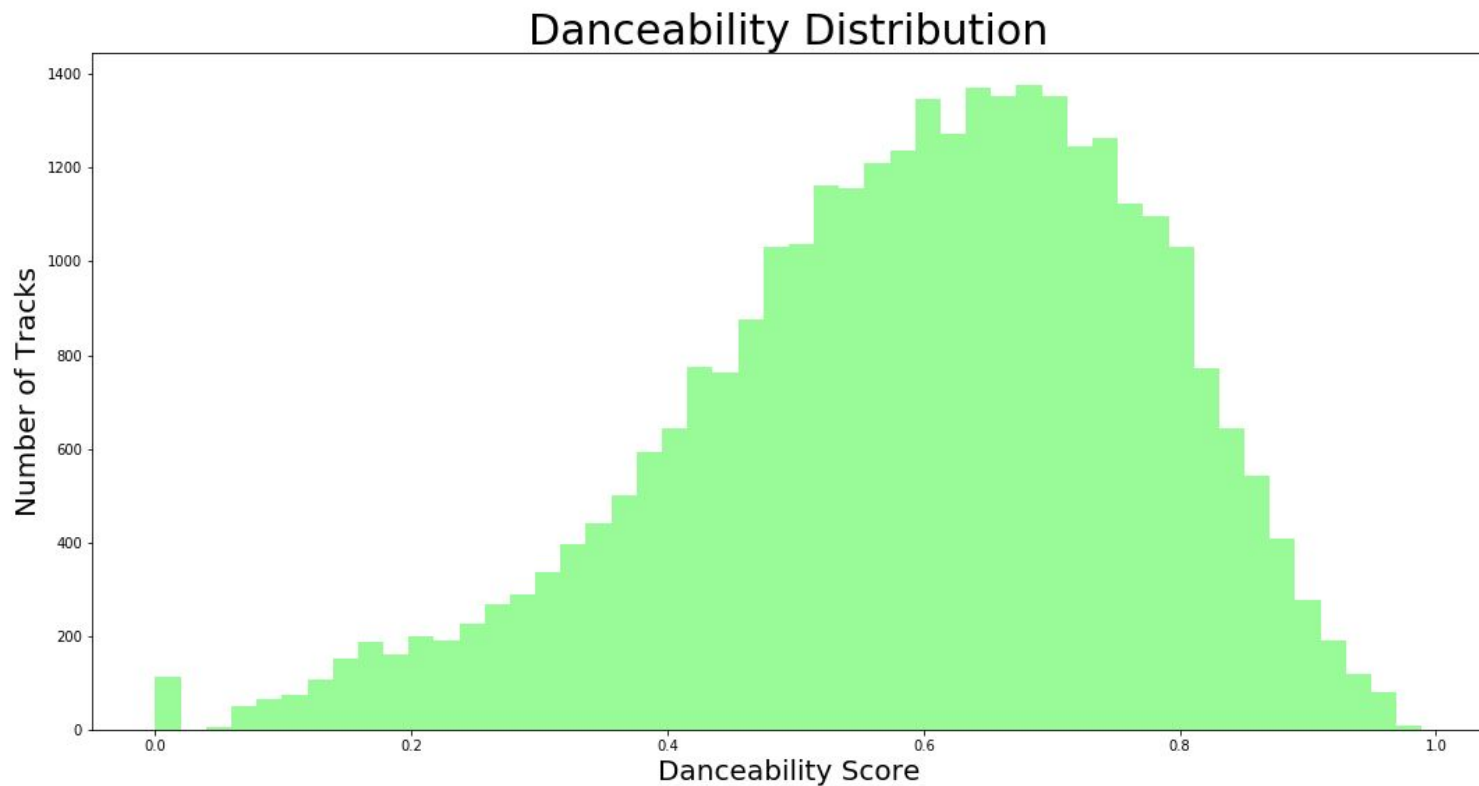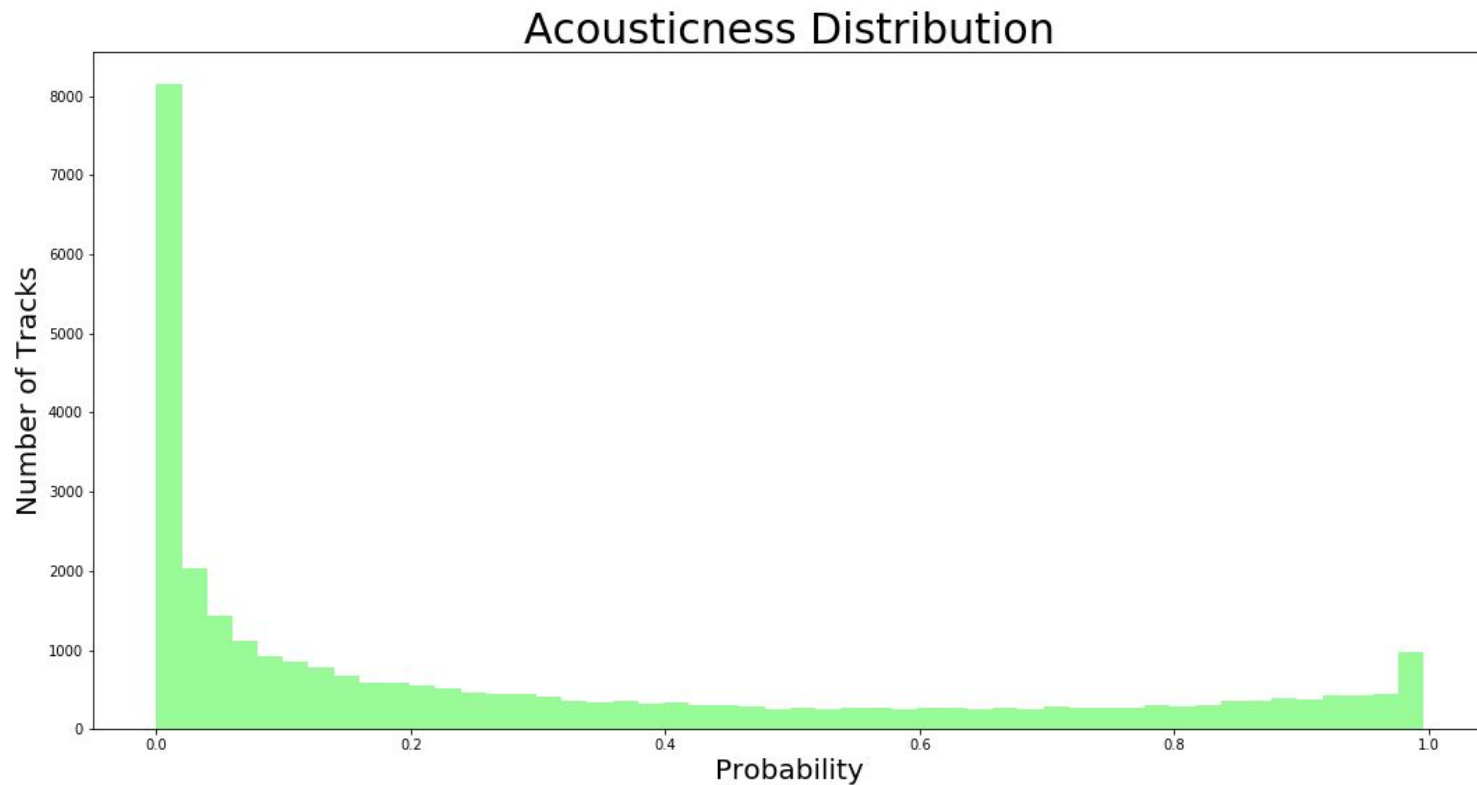
❏ Appended genres associated with each artists

EDA

Top Artist in the Song Library

EDA (cont.)

Danceability Distribution

EDA (cont.)

Acousticness Distribution

Key Findings - Topic Modeling with Genres

	component_1
noise pop	0.198889
lo-fi	0.196611
indie rock	0.193215
experimental rock	0.172082
dream pop	0.170945
post-punk	0.165277
noise rock	0.163242
alternative rock	0.162757
new wave	0.159271
art rock	0.147974

	component_2
jazz	0.294913
cool jazz	0.292676
bebop	0.290596
contemporary post-bop	0.273456
hard bop	0.261228
soul jazz	0.221199
free jazz	0.199837
jazz fusion	0.191700
big band	0.184184
avant-garde jazz	0.181977

	component_5
rap	-0.181957
hip hop	-0.179599
pop rap	-0.173294
southern hip hop	-0.154189
loudness	-0.149933
acousticness	0.143515
gangster rap	-0.138560
energy	-0.137798
trap music	-0.134104
instrumentalness	0.116722

Key Findings - Clustering with HDBSCAN

Cluster 1
Relaxation Vibes

Music For Concentration
Peaceful Piano
Piano in the Background
Instrumental Study
Ambient Relaxation
Yoga & Meditation
Cool Down
Stress Relief
Relaxing Massage
SPA Treatment
Calm Vibes
Deep Focus
Reading Chill Out
Intense Studying

Cluster 2
Chill Beats

Lush Lofi
Chill Lofi Study Beats
Lo-Fi Beats
Chill Instrumental Beats
Jazz Vibes
Tender
Lofi Hip-Hop
Mellow Beats
Lofi Love
Quiet Hours
Cute Beats
Focus Flow
Brain Food

Cluster 3
(Hot) Country

Country Nights
Country by the Grace of God
Forever Country
Chillin' on a Dirt Road
Country Gold
Hot Country
Drunk and Hung Over
Tailgate Party
New Traditions: Country Heroes
Country Heartache
Country Coffeehouse
Nashville Stripped
CMA Award Nominees - 2018

Making Recommendations

Artist: Logic
Track: Keanu Reeves
Genres: Conscious/Lyrical Hip-Hop

get_recs_updated('Keanu Reeves_Logic_State of Mind')

	Track_Artist	Similarity	Artist
0	Confessions of a Dangerous Mind_Logic_Mind Right	0.997125	Logic
1	Homicide_Logic_RapCaviar	0.997037	Logic
2	YSIV_Logic_Mind Right	0.994908	Logic
3	I'm Probably Gonna Rock Your World_Logic_POLLEN	0.986726	Logic
4	Big Fish_Vince Staples_Raising the Bar	0.961267	Vince Staples
5	Angels (feat. Saba)_Chance the Rapper_Ill Lyri...	0.959216	Chance the Rapper
6	My Own Thing_Chance the Rapper_Mind Right	0.958944	Chance the Rapper
7	Home_Vince Staples_Anti Pop	0.957846	Vince Staples
8	No Problem (feat. Lil Wayne & 2 Chainz)_Chance...	0.95714	Chance the Rapper
9	All Night (feat. Knox Fortune)_Chance the Rapp...	0.955309	Chance the Rapper
10	FUN!_Vince Staples_Cali Fire	0.953245	Vince Staples
11	I Might Need Security_Chance the Rapper_Dorm Daze	0.953205	Chance the Rapper
12	Superstar (feat. Matthew Santos)_Lupe Fiasco_A...	0.950786	Lupe Fiasco
13	Norf Norf_Vince Staples_Raising the Bar	0.949566	Vince Staples
14	Just Let Go_Joyner Lucas_Signed XOXO	0.949148	Joyner Lucas
15	Born Sinner_J. Cole_Fun Run 150–165 BPM	0.947535	J. Cole
16	Motiv8_J. Cole_Workout Twerkout	0.947511	J. Cole
17	I Love_Joyner Lucas_Get Turnt	0.947473	Joyner Lucas
18	Potato Salad_Tyler, The Creator_POLLEN	0.946072	Tyler, The Creator
19	Actin Crazy_Action Bronson_Raising the Bar	0.942521	Action Bronson

Making Recommendations

Artist: Jorja Smith
Track: Blue Lights
Genres: R&B, Contemporary R&B, Neo-soul

	Track_Artist	Similarity	Artist
0	Lost & Found_Jorja Smith_Soul Lounge	0.997068	Jorja Smith
1	Goodbyes_Jorja Smith_Down In The Dumps	0.978084	Jorja Smith
2	Shot Clock_Ella Mai_Love, Sex, & Water	0.976891	Ella Mai
3	Run My Mouth_Ella Mai_Bedroom Jams	0.971172	Ella Mai
4	Don't Watch Me Cry_Jorja Smith_50 Great Female...	0.969753	Jorja Smith
5	Let Me Down - Shy FX Remix_Jorja Smith_Sunshin...	0.966846	Jorja Smith
6	On My Mind (Jorja Smith X Preditah)_Jorja Smit...	0.966392	Jorja Smith
7	She Don't (feat. Ty Dolla $Ign)_Ella Mai_All T...	0.966274	Ella Mai
8	Trip_Ella Mai_Signed XOXO	0.961973	Ella Mai
9	EX - Remix_Kiana Ledé_Love, Sex, & Water	0.953556	Kiana Ledé
10	EX_Kiana Ledé_Pop Hits The Spot	0.953252	Kiana Ledé
11	Who Hurt You?_Daniel Caesar_Love, Sex, & Water	0.949484	Daniel Caesar
12	Get You (feat. Kali Uchis)_Daniel Caesar_All T...	0.947024	Daniel Caesar
13	EX_Kiana Ledé_Make Out Jams	0.946405	Kiana Ledé
14	Boo'd Up_Ella Mai_The GRAMMYs Official Playlist	0.945446	Ella Mai

Learnings | Next Steps

- ❏ **Item-User Based Recommender:** By representing playlists as users and building an item-user based recommender we can better validate predictions using LOOCV
- ❏ **Transfer Learning of Clusters:** As a next step we'lll want to incorporate the clusters generated from the HDBSCAN as a feature in our track data set. This may improve future recommendations
- ❏ **Impact of Artist Genres:** Genres are artist based, not song based. More investigation is needed to understand how genres weight the recommendation vs track features