



MUSIC TO MY EARS

VU BROWN

Building A Musical Track Recommendation System



AGENDA

- Background & Inspiration
- The Data
- Modeling
- Results
- Next Steps

Background & Inspiration

Music Streaming Services

All use recommendation systems to recommend new tracks to listeners

'Discover Weekly'

Spotify's weekly personalized playlist which uses audio-related features associated with tracks acquired from The Echo Nest

My Alternative Approach

Dubbed 'Music to My Ears'

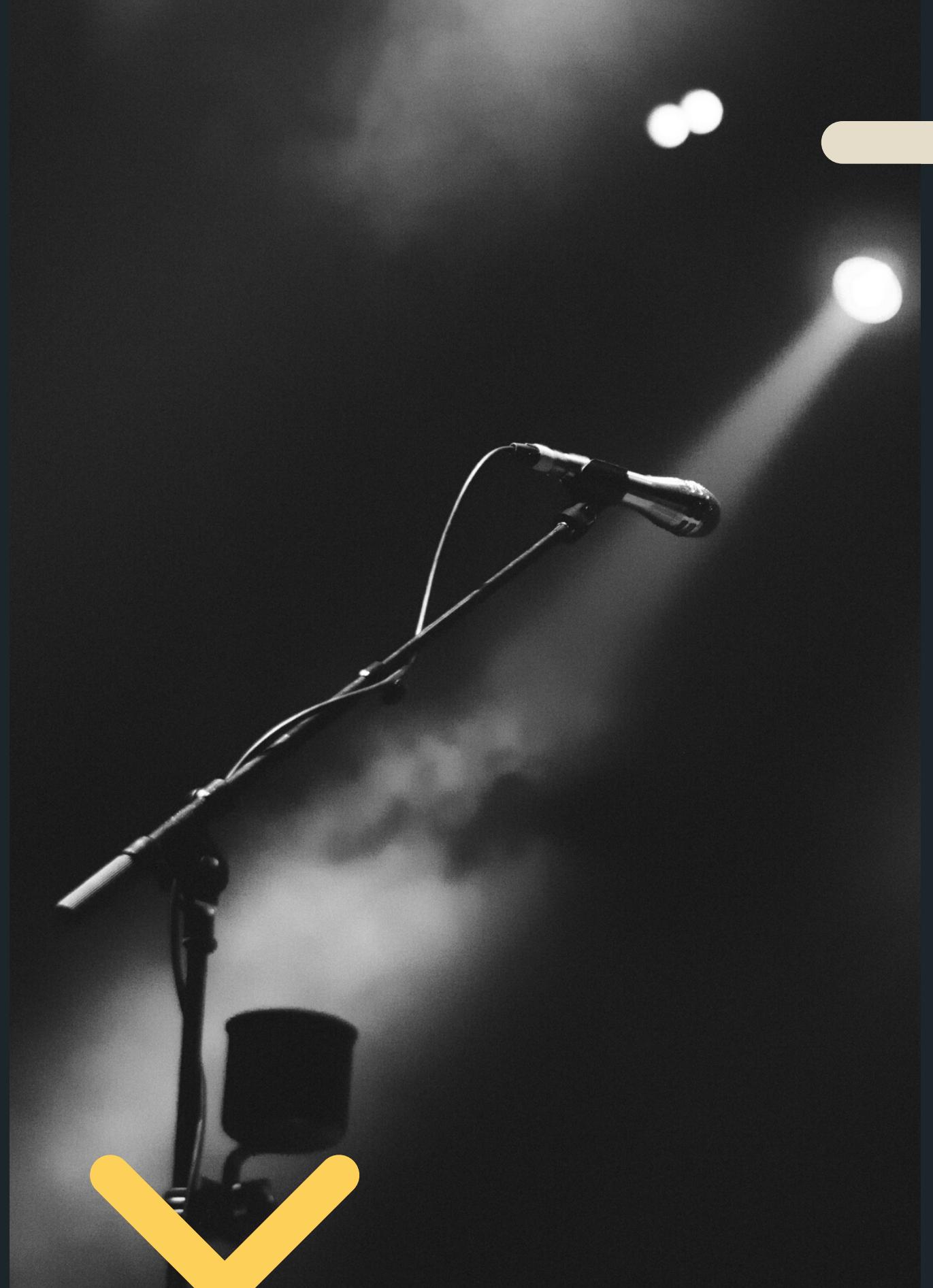
Utilize only Spotify users' track preferences to develop a list of recommended tracks

The Data

- **1,000,000 playlists - Alcrowd**
- **API calls - Spotify Web API**

Assumption

Each playlist represents a user's track preferences



Non-negative Matrix Factorization (NMF) - Modeling

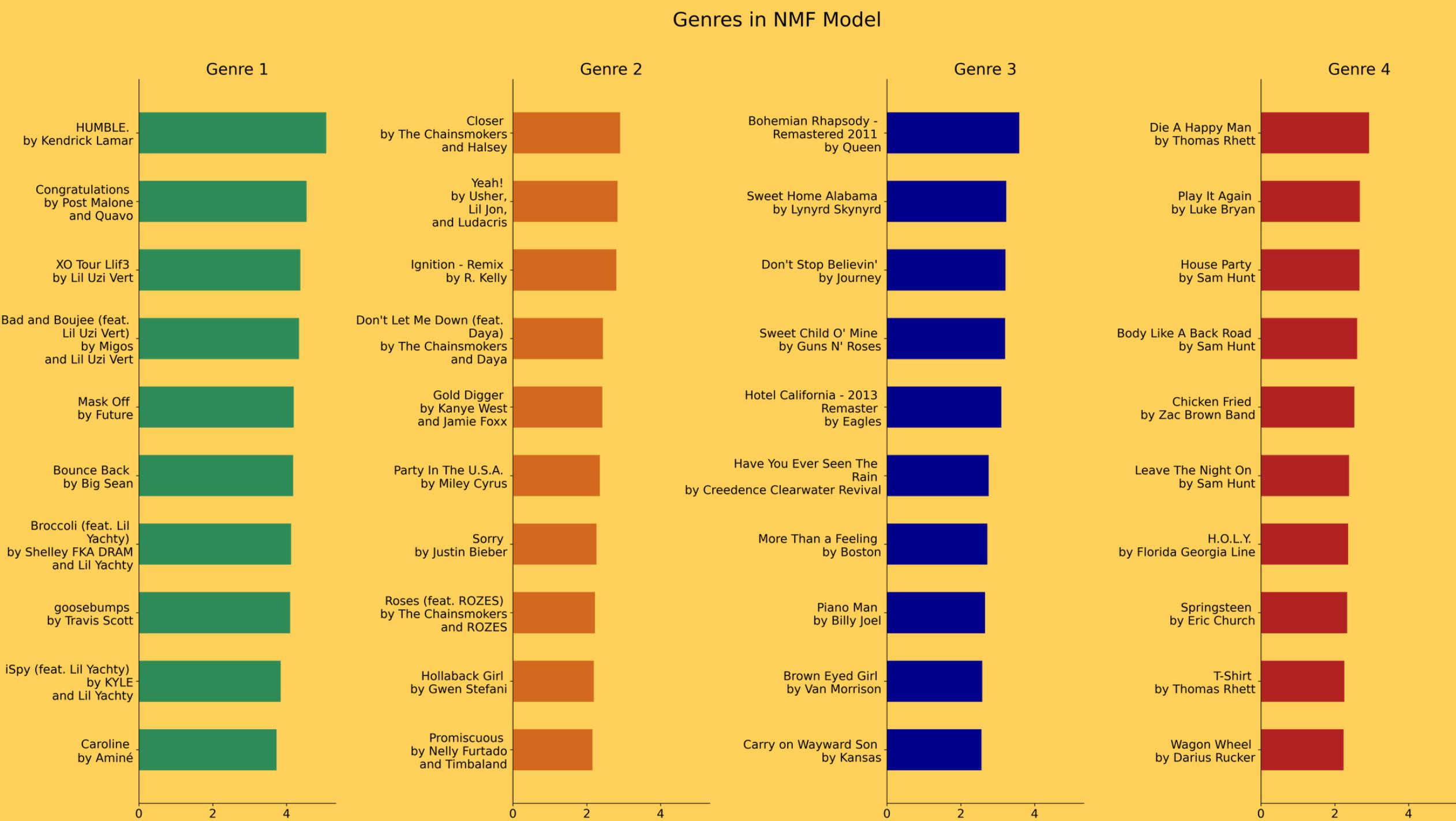
Dimensionality Reduction

V = Tracks by Playlists

W = Tracks by Genres

H = Genres by Playlists

$$\begin{bmatrix} W \\ \vdots \\ \vdots \end{bmatrix} \times \begin{bmatrix} H \\ \vdots \\ \vdots \end{bmatrix} \approx \begin{bmatrix} V \\ \vdots \\ \vdots \end{bmatrix}$$

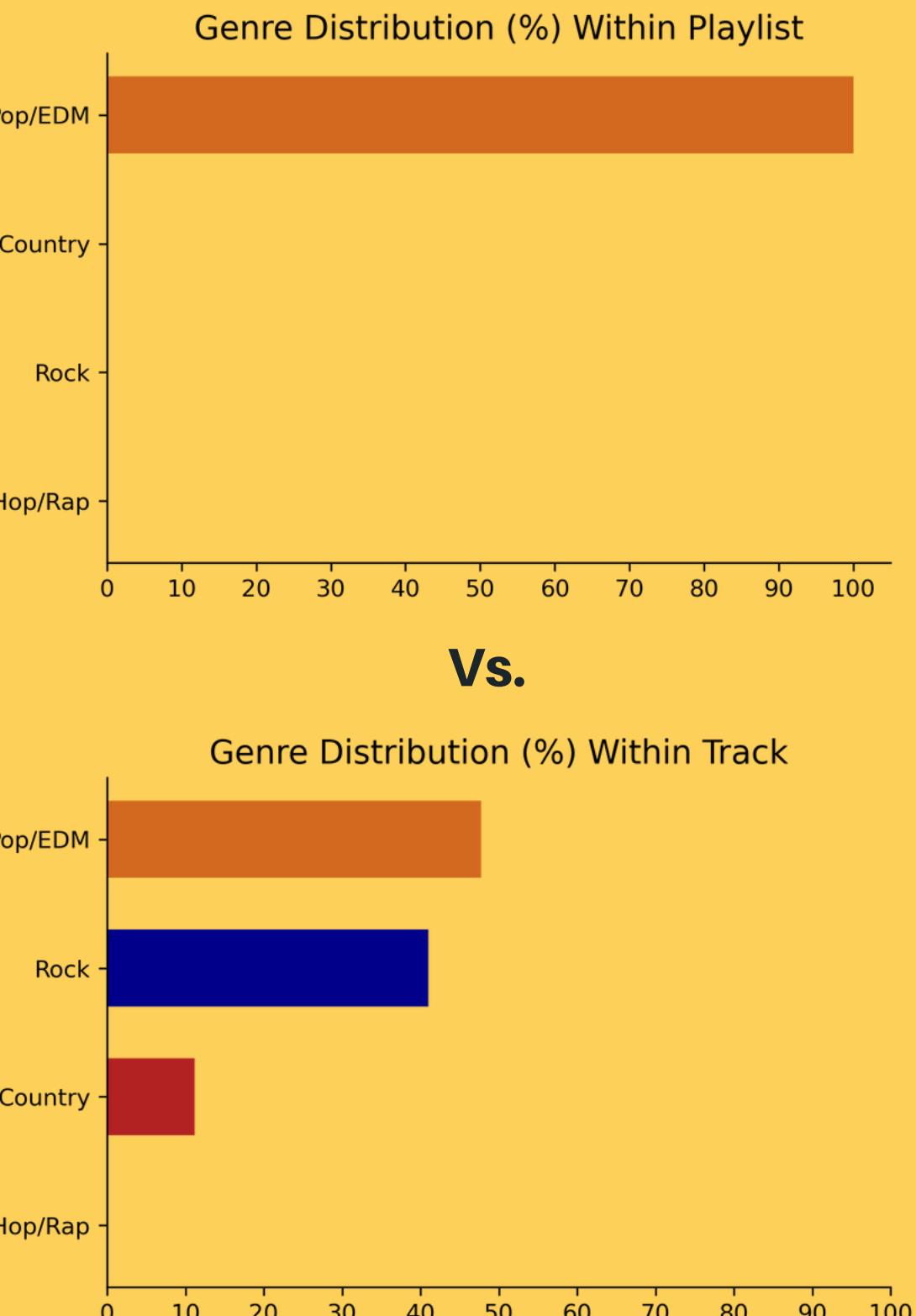


Cosine Similarity - Modeling

My Playlist

1. Red Lights by Tiësto
2. #SELFIE by The Chainsmokers
3. Hello - Single Edit by Martin Solveig and Dragonette
4. This Is What It Feels Like - W&W Remix by Armin van Buuren, Trevor Guthrie, and W&W
5. Alive by Empire of the Sun and Zedd
6. Safe And Sound by Capital Cities
7. Heroes (we could be) by Alesso and Tove Lo
8. Seeing Stars by First State and Sarah Howells
9. Tsunami by DVBBS and Borgeous
10. Clash by Alesso
11. Years by Alesso and Matthew Koma
12. All Night - Cash Cash Remix; Radio Edit by Icona Pop and Cash Cash
13. Waiting For Love by Avicii
14. Alive by Krewella
15. Fade Into Darkness - Vocal Club Mix by Avicii
16. Take Me Home (feat. Bebe Rexha) by Cash Cash and Bebe Rexha

Summary: 16 EDM tracks



Top 10 Recommended Tracks

1. Breathe - Prog Radio Edit by John O'Callaghan, Full Tilt, and Karen Kelly (EDM)
2. Mix De Novillos Musical by Novillos Musical (S-S)
3. Verano by Archie (EDM)
4. Chrome - Original Mix by Fabian Kash (EDM)
5. Los Desengaños by Nelson Henriquez and Pastor Lopez (S-S)
6. Whatcha Say - B-Tastic Edit by Henry Blank (EDM)
7. Los Celos de Mi Compay by El Gran Combo De Puerto Rico (S-S)
8. Guarda Roupa Maldito by Teodoro & Sampaio (S-S)
9. Bitches Like Fridays - Filip Jenven Remix Radio Edit by Ace Wilder (EDM)
10. Yo Te Quiero Ver by Antony Santos (S-S)

**Summary: 5 EDM tracks,
5 Spanish-Speaking**



Model Results

- Liked 3 out of the 10 recommended tracks
- Non-English-speaking tracks are not ideal
- Results from other playlists indicate the model works alright



Next Steps

- Utilize audio features from Spotify Web API
- Merge model with a classification model that predicts top hits based upon Spotify's popularity metric

QUESTIONS?

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