

# MUSIC RECOMMENDATION SYSTEM USING CLUSTERING AND RL

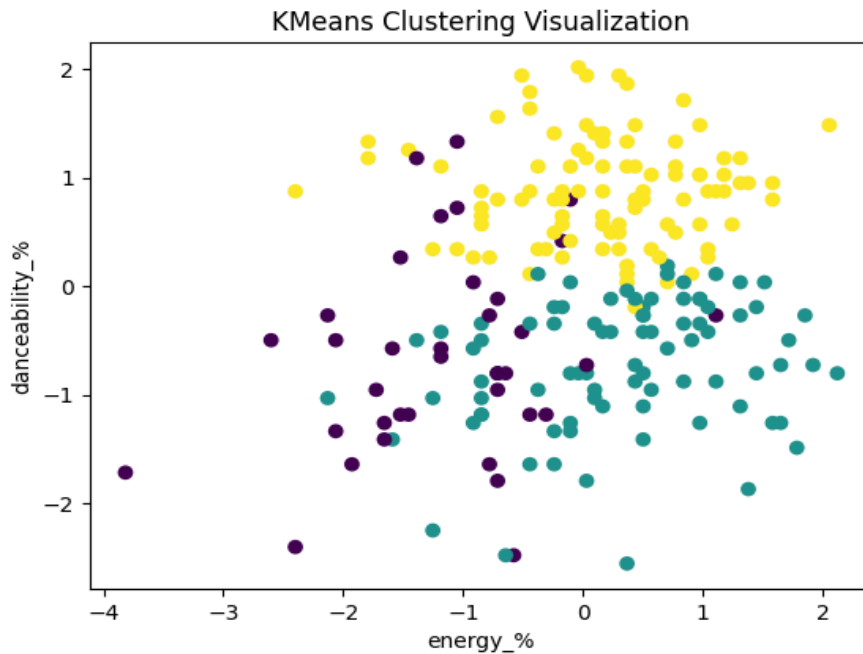
## Description

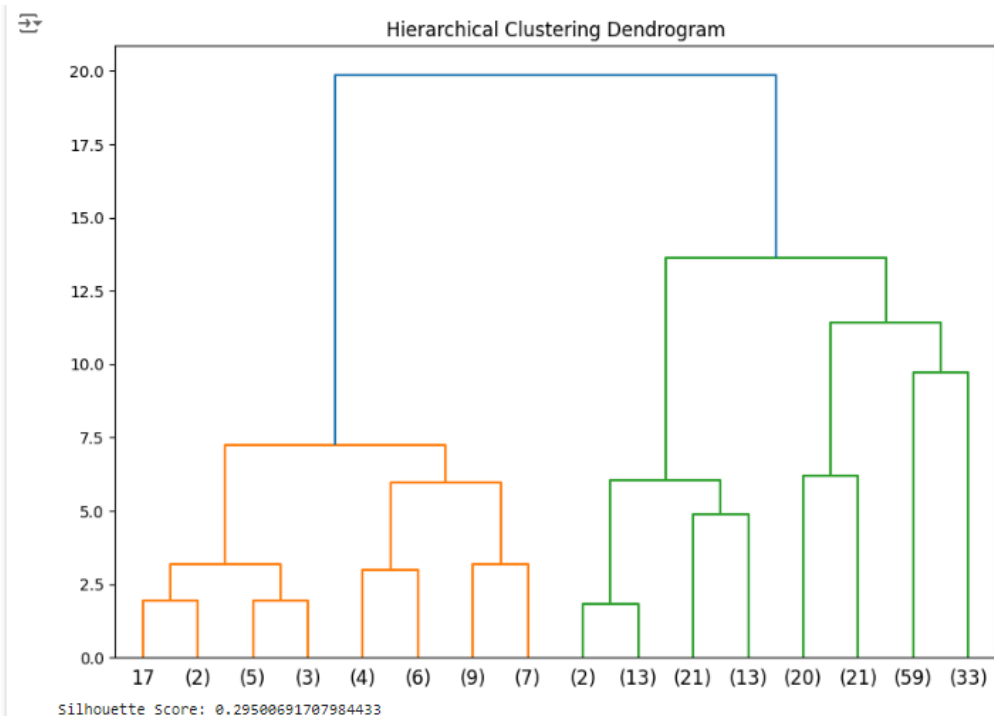
A music playlist generator using Reinforcement Learning (QLearning & Policy Gradient) and KMeans clustering. The project clusters songs into moods (Energetic, Chill, Acoustic) using KMeans and then compares QLearning and Policy Gradient algorithms to generate personalized playlists.

## Output

### Clustering:

```
Columns in the dataset:
Index(['track_name', 'artist(s)_name', 'artist_count', 'released_year',
      'released_month', 'released_day', 'in_spotify_playlists',
      'in_spotify_charts', 'streams', 'in_apple_playlists', 'in_apple_charts',
      'in_deezer_playlists', 'in_deezer_charts', 'in_shazam_charts', 'bpm',
      'key', 'mode', 'danceability_%', 'valence_%', 'energy_%',
      'acousticness_%', 'instrumentalness_%', 'liveness_%', 'speechiness_%'],
      dtype='object')
Selected Features: ['energy_%', 'danceability_%', 'acousticness_%']
Initial Clusters:
[2 2 1 1 1 1 2 2 2 2 2 2 1 2 2 0 1 1 2 0 2 1 1 1 1 2 2 2 2 2 1 1 2 1 2 1 0 2 1
 2 1 2 1 0 1 0 2 1 2 1 2 1 2 1 2 1 0 1 2 2 2 0 2 2 2 0 2 1 1 0 1 1 2 2 0 1
 1 1 0 2 2 2 1 0 0 1 1 2 0 2 2 0 2 2 1 1 1 2 0 1 1 1 0 2 1 1 2 0 2 1 2 1 2
 0 2 1 1 2 1 2 2 0 2 1 2 1 2 2 1 1 0 2 2 2 1 2 1 0 2 2 1 0 2 0 2 2 2 0 1 1
 0 2 2 2 1 2 2 1 1 1 1 2 2 2 2 1 1 1 0 0 2 0 0 1 1 1 1 2 1 2 1 2 0 2 1 1 1
 2 0 2 1 0 1 1 1 1 0 2 2 1 2 1 1 1 0 2 0 2 1 2 2 2 0 2 2 2 2 2 1 2 1]
Final Clusters after 12 epochs:
[2 2 1 1 1 1 2 2 2 2 2 1 2 2 0 1 1 2 0 2 1 1 1 1 2 2 2 2 2 1 1 2 1 2 1 0 2 1
 2 1 2 1 0 1 0 2 1 2 1 2 1 2 1 0 1 2 2 2 0 2 2 2 0 2 1 1 0 1 1 2 2 0 1
 1 1 0 2 2 2 1 0 0 1 1 2 0 2 2 0 2 2 1 1 1 2 0 1 1 1 0 2 1 1 2 0 2 1 2 1 2
 0 2 1 1 2 1 2 2 0 2 1 2 1 2 2 1 1 0 2 2 2 1 2 1 0 2 2 1 0 2 0 2 2 2 0 1 1
 0 2 2 2 1 2 2 1 1 1 1 2 2 2 2 1 1 1 0 0 2 0 0 1 1 1 1 2 1 2 1 2 0 2 1 1 1
 2 0 2 1 0 1 1 1 1 0 2 2 1 2 1 1 1 0 2 0 2 1 2 2 2 0 2 2 2 2 2 1 2 1]
Error Rate: 322.9970346797456
```





## Recommendations:

Enter cluster number (0 - ENERGETIC , 1-CHILL AND 2-ACOUSTIC) to generate playlist: 0  
Generating playlist for mood: Energetic

Generated Playlist using Policy Gradient for Cluster Energetic:

	track_name \
72	golden hour
89	MONTAGEM - FR PUNK
170	Let Me Down Slowly
189	Take Me To Church
34	TQG
111	Tak Segampang Itu
202	AcrÃÃÃÃÃs
105	Primera Cita
166	Every Breath You Take - Remastered 2003
148	Those Eyes
41	Sunflower - Spider-Man: Into the Spider-Verse
180	Night Changes
81	Until I Found You (with Em Beihold) - Em Beiho...
145	Stargirl Interlude
17	What Was I Made For? [From The Motion Picture ...

Generated Playlist for Cluster 0:

	track_name \
13	Daylight
17	What Was I Made For? [From The Motion Picture ...
34	TQG
41	Sunflower - Spider-Man: Into the Spider-Verse
43	See You Again
54	Another Love
59	cardigan
63	BESO
67	People
72	golden hour
76	Here With Me
81	Until I Found You (with Em Beihold) - Em Beiho...
82	Novidade na ÃÃÃÃÃÃ
86	Someone You Loved
89	MONTAGEM - FR PUNK
96	Say Yes To Heaven
100	Lover
105	Primera Cita
111	Tak Segampang Itu
119	august
128	lovely - Bonus Track
135	Calling (Spider-Man: Across the Spider-Verse) ...