Spotify Music Recommentation System

A Project Report

submitted in partial fulfillment of the requirements

Of

Track Name: AIML Fundamentals With Cloud Computing And Gen AI

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Abstract

Develop a music recommendation system that suggests songs to users based on their listening history and preferences. Improve user engagement and satisfaction with the Spotify platform. Increase music discovery and exploration among users. Users often struggle to find new music that aligns with their tastes and preferences. Existing music recommendation systems may not fully capture user preferences or provide accurate suggestions. Spotify aims to improve its recommendation system to enhance user experience and competitiveness. content-based filtering works on item features. This filtering method recommends new items having similar characteristics as the user's previous engagements. Collaborative filtering analyze user listening history and behavior to identify patterns and preferences. Natural language processing analyze song metadata and lyrics to understand musical characteristics and themes. Hybrid approach combine collaborative filtering and natural language processing to generate recommendations. User testing and feedback refine and iterate on the recommendation system based on user input. Improved user engagement and satisfaction with Spotify's recommendation system. Increased music discovery and exploration among users. Enhanced accuracy and relevance of music recommendations. Positive impact on user retention and overall Spotify platform success. Spotify's music recommendation system aims to provide users with personalized and relevant music suggestions. By leveraging collaborative filtering, natural language processing, and user feedback, the system can improve user engagement and satisfaction. Continuous iteration and refinement will ensure the system remains competitive and effective in enhancing user experience.

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CHAPTER 1

Introduction

1.1 Problem Statement:

- The Users often struggle to find new music that aligns with their tastes and preferences.
- Existing music recommendation systems may not fully capture user preferences or provide accurate suggestions
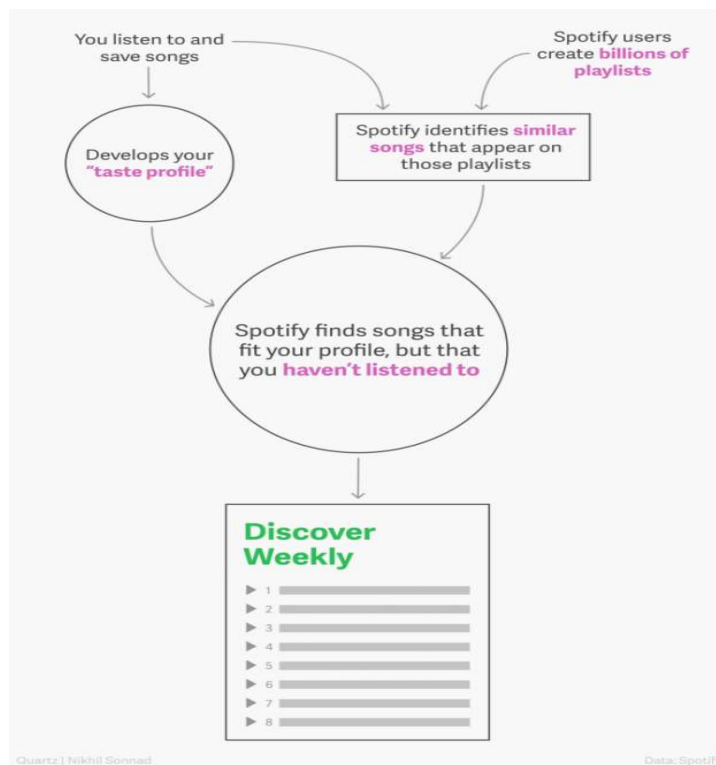- Spotify aims to improve its recommendation system to enhance user experience and competitiveness.

Fig.1. Problem Statement Flow Diagram

1.2 Motivation:

- Provide users with personalized music recommendations that match their listening preferences, increasing user satisfaction and engagement.
- Expose users to new artists, genres, and songs they may not have found otherwise, promoting music exploration and discovery.
- By providing a unique and valuable experience, Spotify aims to retain existing customers and attract new ones, ultimately driving business growth.

1.3 Objective:

- Develop a music recommendation system that suggests songs to users based on their listening history and preferences.
- Improve user engagement and satisfaction with the Spotify platform.
- Increase music discovery and exploration among users.

1.4 Scope of the Project:

The scope of the Spotify music recommendations system project is to design and develop a personalized music recommendation system that suggests songs to users based on their listening history and preferences. Generate personalized music recommendations based on user profiles and music features. Support multi-platform functionality, ensuring seamless recommendations across various devices and platforms. Rank recommendations based on relevance and users. Incorporate user feedback and ratings to improve recommendation accuracy. Integrating the recommendation system with external services or third-party APIs.

Limitations:

Personalization: The system may not be able to provide personalized recommendations for users with limited listening history or diverse musical tastes.

Data quality and availability: The systems performance is dependent on the quality and availability of user data and music features.

Scalability: The system may face scalability issues when handling large volumes of user data and traffic.

User adoption: The system may face challenges in achieving user adoption and engagement.

System complexity: The system may be complex to develop and maintain due to the integration of multiple components and approaches.

Evaluation metrics: The system may face challenges in evaluating its effectiveness due to the lack of standardized evaluation metrics.

CHAPTER 2

Literature Survey

Ashu Abdul, Jenhui Chen et [13] proposed an emotion-aware personalized music recommendation system (EPMRS) by combining two approaches the deep convolutional neural networks (DCNN) approach and the weighted feature extraction (WFE) approach to extract the correlation between the user data and the music.

They use a DCNN approach to find the music data features like audio signals and corresponding metadata to be used for the classification processes. Also, the second approach WFE it's used with TF-IDF inverse document frequency to find the implicit rating data from the users to songs they have to listen to.

This proposed algorithm has a better accuracy recommendation system compared with two other systems, content similarity music recommendation systems (CSMRS), as well as the personalized music recommendation system based on electroencephalography feedback (PMRSE).

Gokul Krishnan K, Parthasarathy M, et [2] proposed an algorithm using machine learning to use user emotions as input to the system and build an automated playlist. They built an android application to use the smartphone camera to detect user emotion and recommend songs based on his emotion.

Pasquale Lops, Marco American state Gemmis, and Giovanni Semeraro, 2010 [1] in their paper Content-based Recommender Systems: State of the Art and Trends discusses the most problems associated with the illustration of things, ranging from easy techniques for representing structured information to a lot of complicated techniques returning from {the information the knowledge the information Retrieval analysis space for unstructured data.

Robin Burke, [2] in his survey Hybrid Recommender Systems: Survey and Experiments, explains numerous recommendation techniques. These techniques show the complementary benefits and downsides. It compares the assorted techniques and shows that techniques area unit higher supported the analysis metrics. This reality has provided an incentive for analysis in hybrid recommender systems that mix techniques for improved performance.

The system may not be able to provide personalized recommendations for users with limited listening history or diverse musical tastes.

The systems performance is dependent on the quality and availability of user data and music features.

CHAPTER 3

Proposed Methodology

content-based Filtering: works on item features. This filtering method recommends new items having similar characteristics as the user's previous engagements.
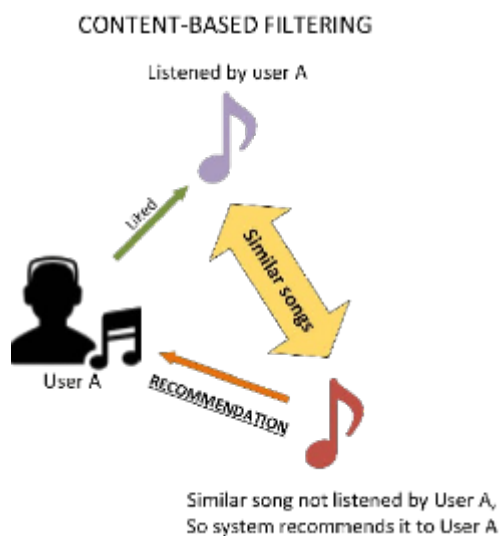
Fig.2. Content-Based Filtering Figures

Collaborative Filtering: Analyze user listening history and behavior to identify patterns and preference**s.**
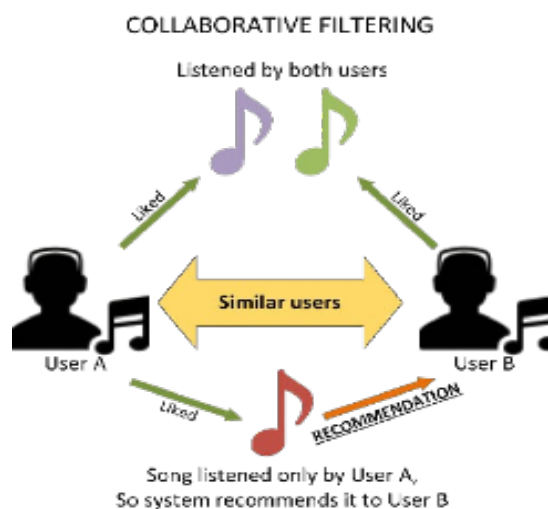
Fig.3. Collaborative Filtering Figures

Hybrid Filtering: combine collaborative filtering and natural language processing to generate recommendations.
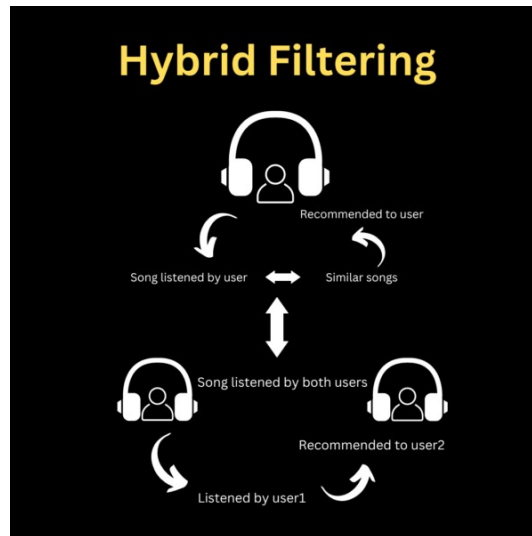
Fig.4. Hybrid Filtering Figures

3.1. System Design
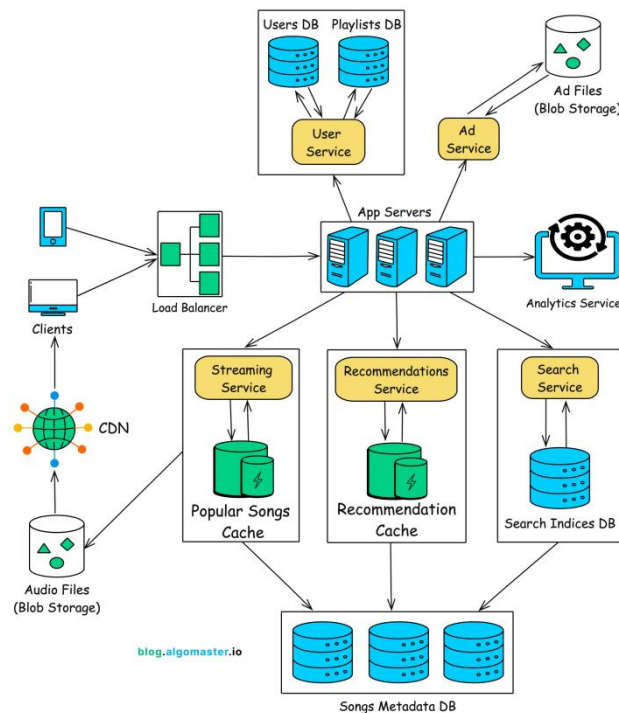
Fig.5. High Level System Design

3.2. Modules Used

Data Processing Module: Processes and transforms collected data into a format suitable for analysis.

User Profiling Module: Creates and maintains user profiles based on listening history and preferences.

Data Storage Module: Stores user data, music features, and recommendation results.

Data Ingestion Module: Collects user data and music features from various sources.

User Interface Module: Provides a user-friendly interface for users to interact with the recommendations system.
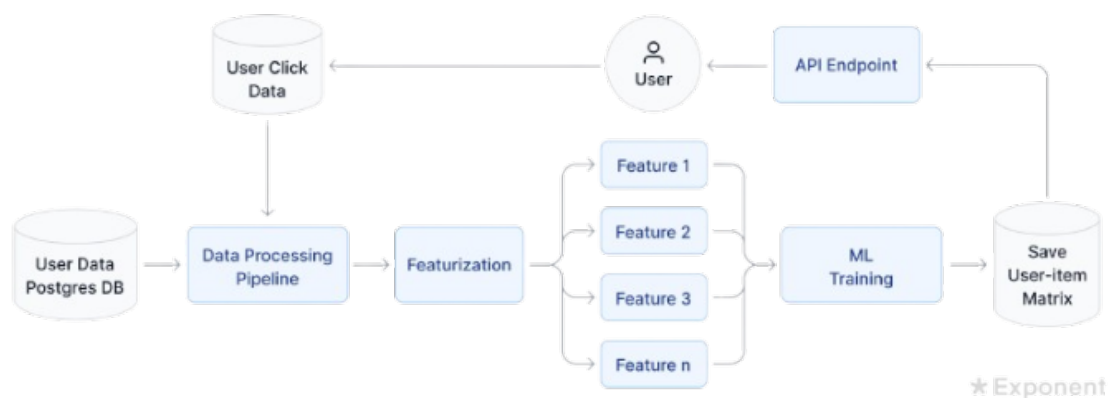
Fig.6. Module Flow Diagram

3.3. Data Flow Diagram

A Data Flow Diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).
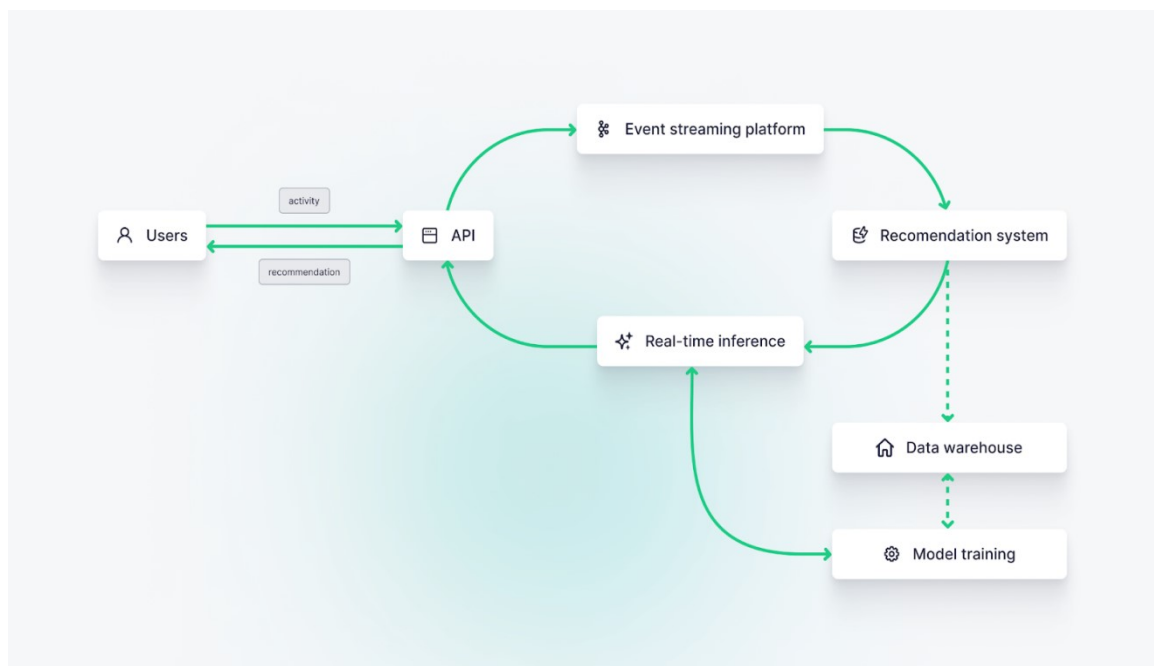
Fig.7. Data Flow Diagram

|	Song-Name	Singer/Artists	Genre	Album/Movie	User-Rating
2	Aankh Marey	Kumar Sanu, Mika Singh, Neha Kakkar	BollywoodDance	Simmba	8.8/10
3	Coca Cola	Neha Kakkar, Tony Kakkar	BollywoodDanceRomantic	Luka Chuppi	9.0/10
4	Apna Time Aayega	Ranveer Singh	BollywoodDance	Gully Boy	9.7/10
5	Mungda	Jyotica Tangri, Shaan, Subhro Ganguly	BollywoodDance	Total Dhamaal	9.1/10
6	Tere Bin	Asees Kaur, Rahat Fateh Ali Khan, Tanishk Bagchi	BollywoodRomantic	Simmba	9.2/10
7	Gali Gali	Neha Kakkar	BollywoodDance	KGF	9.1/10
8	Chamma Chamma	Arun, Ikka, Neha Kakkar, Romy	BollywoodDance	Fraud Saiyaan	9.2/10
9	Mere Gully Mein	Ranveer Singh	BollywoodDance	Gully Boy	9.5/10
10	Kamariya	Darshan Raval	BollywoodDance	Mitron	9.2/10
11	Ek Ladki Ko Dekha Toh Aisa Laga	Darshan Raval, Rochak Kohli	BollywoodRomantic	Ek Ladki Ko Dekha Toh Aisa Laga	9.6/10
12	Swag Se Swagat	Neha Bhasin, Vishal Dadlani	BollywoodDance	Tiger Zinda Hai	8.8/10
13	Poster Lagwa Do	Mika Singh, Sunanda Sharma	BollywoodDance	Luka Chuppi	8.4/10
14	Daaru Wargi	Guru Randhawa	BollywoodDance	Cheat India	9.1/10
15	Dilbar	Dhvani Bhanushali, Ikka, Neha Kakkar	BollywoodDance	Satyameva Jayate	9.2/10
16	Proper Patola	Aastha Gill, Badshah, Diljit Dosanjh	BollywoodDance	Namaste England	9.0/10
17	Doori	Ranveer Singh	BollywoodDance	Gully Boy	9.7/10
18	Dil Diyan Gallan	Atif Aslam	BollywoodRomantic	Tiger Zinda Hai	9.1/10
19	Husn Parcham	Bhoomi Trivedi, Raja Kumari	BollywoodDance	Zero	9.0/10
20	Bom Diggy Diggy	Jasmin Walia, Zack Knight	BollywoodDance	Sonu Ke Titu Ki Sweety	9.0/10
21	Issaqbaazi	Divya Kumar, Sukhwinder Singh	BollywoodDance	Zero	9.1/10
22	Mere Naam Tu	Abhay Jodhpurkar	BollywoodRomantic	Zero	9.2/10
23	High Rated Gabru – Nawabzaade	Guru Randhawa	BollywoodDance	Nawabzaade	9.2/10

Song Data Base Table.1.

24	Dekhte Dekhte	Atif Aslam	BollywoodRomantic	Batti Gul Meter Chalu	9.5/10
25	Zingaat	Ajay, Atul	BollywoodDance	Dhadak	8.6/10
26	Tareefan	Badshah	Bollywood	Veere Di Wedding	9.1/10
27	Mile Ho Tum (Reprise)	Neha Kakkar, Tony Kakkar	BollywoodRomantic	Fever	9.0/10
28	Dil Chori	Ishers, Simar Kaur, Yo Yo Honey Singh	BollywoodDance	Sonu Ke Titu Ki Sweety	9.0/10
29	Tere Naal Nachna	Badshah, Sunanda Sharma	BollywoodDance	Nawabzaade	9.2/10
30	Dil Meri Na Sune	Atif Aslam	BollywoodRomantic	Genius	9.5/10
31	Dhadak Title Track	Ajay Gogavale, Shreya Ghoshal	BollywoodRomantic	Dhadak	9.4/10
32	Heeriye	Deep Money, Meet Bros, Neha Bhasin	BollywoodDanceRomantic	Race 3	8.7/10
33	Chogada	Asees Kaur, Darshan Raval	BollywoodDance	Loveratri	9.3/10
34	Gud Naal Ishq Mitha	Harshdeep Kaur, Navraj Hans	BollywoodDance	Ek Ladki Ko Dekha Toh Aisa Laga	9.3/10
35	Paniyon Sa	Atif Aslam, Tulsi Kumar	BollywoodRomantic	Satyameva Jayate	9.5/10
36	Milegi Milegi	Mika Singh	BollywoodDance	Stree	9.1/10
37	Morni Banke	Guru Randhawa, Neha Kakkar	BollywoodDance	Badhaai Ho	9.0/10
38	Bhare Bazaar	B Praak, Badshah, Payal Dev, Vishal Dadlani	BollywoodDance	Namaste England	9.0/10
39	Khalibali	Shivam Pathak	BollywoodDance	Padmaavat	9.1/10
40	Aao Kabhi Haveli Pe	Badshah, Jigar, Nikhita Gandhi, Sachin Sanghvi	BollywoodDance	Stree	8.4/10
41	Badri Ki Dulhania	Dev Negi, Ikka, Monali Thakur, Neha Kakkar	BollywoodDance	Badrinath Ki Dulhania	8.4/10
42	Cheez Badi	Neha Kakkar, Udit Narayan	BollywoodDance	Machine	8.8/10
43	Dholida	Neha Kakkar, Palak Muchchal, Raja Hassan, Udit Nar	BollywoodDance	Loveratri	9.2/10
44	Sweetheart	Dev Negi	BollywoodDance	Kedarnath	9.2/10
45	Namo Namo	Amit Trivedi	BollywoodDevotional	Kedarnath	9.6/10

Song Data Base Table.2.

47	Tu Hi Re	Armaan Malik, Shashaa Tirupati	BollywoodDance		2 9.0/10
48	Chhote Chhote Peg	Navraj Hans, Neha Kakkar, Yo Yo Honey Singh	BollywoodDance	Sonu Ke Titu Ki Sweety	9.1/10
49	Galti Se Mistake	Amit Mishra, Arijit Singh	BollywoodDance	Jagga Jasoos	8.5/10
50	Phir Mulaaqat	Jubin Nautiyal	BollywoodRomantic	Cheat India	9.5/10
51	Kala Chashma	Amar Arshi, Badshah, Neha Kakkar	BollywoodDance	Baar Baar Dekho	8.5/10
52	Mantoiyat	Raftaar	Bollywood	Manto	9.7/10
53	Nashe Si Chadh Gayi	Arijit Singh	BollywoodDance	Befikre	8.9/10
54	Mera Pyar Tera Pyar	Arijit Singh	BollywoodRomanticSad	Jalebi	9.6/10
55	Ding Dang	Amit Mishra, Antara Mitra	BollywoodDance	Munna Michael	8.5/10
56	Main Tera Boyfriend	Arijit Singh, Meet Bros, Neha Kakkar	BollywoodDance	Raabta	9.1/10
57	Laila Main Laila	Pawni Pandey	BollywoodDance	Raees	8.7/10
58	Ghoomar	Shreya Ghoshal, Swaroop Khan	BollywoodDance	Padmaavat	8.6/10
59	Rafta Rafta Medley	Akash Ojha, Disha Sharma, Jordi Patel, Rekha, Sonak	BollywoodDance	Yamla Pagla Deewana Phir Se	9.3/10
60	Pal	Arijit Singh, Shreya Ghoshal	BollywoodRomantic	Jalebi	9.7/10
61	Patola	Guru Randhawa	BollywoodDance	Black Mail	8.9/10
62	Pallo Latke	Fazilpuria, Jyotica Tangri, Yasser Desai	BollywoodDance	Shaadi Mein Zaroor Aana	9.0/10
63	Main Badhiya Tu Bhi Badhiya	Sonu Nigam, Sunidhi Chauhan	Bollywood	Sanju	9.0/10
64	Billionaire	Simar Kaur, Singhsta, Yo Yo Honey Singh	BollywoodDance	Baazaar	9.3/10
65	This Party Is Over Now	Yo Yo Honey Singh	BollywoodDance	Mitron	9.3/10
66	Heer Badnaam	Romy	BollywoodDanceSad	Zero	9.1/10
67	Tera Hua	Atif Aslam	BollywoodRomantic	Loveratri	9.0/10
68	Jaan Nisaar	Arijit Singh	BollywoodRomantic	Kedarnath	9.7/10
69	Akh Lad Jaaye	Asees Kaur, Badshah, Jubin Nautiyal	BollywoodDanceRomantic	Loveratri	9.2/10

Song Data Base Table.3.

70	Rangtaari	Dev Negi, Yo Yo Honey Singh	BollywoodDance	Loveratri	9.1/10
71	The Humma Song	Badshah, Jubin Nautiyal, Shashaa Tirupati	BollywoodDance	Ok Jaanu	9.0/10
72	Pehli Baar	Ajay Gogavale	BollywoodRomantic	Dhadak	8.9/10
73	Tera Yaar Hoon Main	Arijit Singh	BollywoodRomanticSad	Sonu Ke Titu Ki Sweety	9.5/10
74	Dilbaro	Harshdeep Kaur, Shankar Mahadevan, Vibha Saraf	Bollywood	Raazi	9.5/10
75	Chhod Diya	Arijit Singh	BollywoodSad	Baazaar	9.7/10
76	Maine Tujhko Dekha	Neeraj Shridhar, Sukriti Kakar	BollywoodDance	Golmaal Again	9.0/10
77	Allah Duhai Hai	Amit Mishra, Jonita Gandhi, Sreerama Chandra	BollywoodDance	Race 3	8.1/10
78	Cham Cham	Monali Thakur	BollywoodDance	Baaghi	8.1/10
79	Kar Har Maidaan Fateh	Shreya Ghoshal, Sukhwinder Singh	BollywoodMotivational	Sanju	9.5/10
80	Kamariya	Aastha Gill, Divya Kumar, Jigar Saraiya, Sachin Sangh	BollywoodDance	Stree	9.1/10
81	Tamma Tamma Again	Anuradha Paudwal, Badshah, Bappi Lahiri	BollywoodDance	Badrinath Ki Dulhania	8.6/10
82	Tera Fitoor	Arijit Singh	BollywoodRomantic	Genius	9.4/10
83	Mere Rashke Qamar	Nusrat Fateh Ali Khan, Rahat Fateh Ali Khan	BollywoodRomantic	Baadshaho	9.0/10
84	The Breakup Song	Arijit Singh, Badshah, Jonita Gandhi, Nakash Aziz	BollywoodDance	Ae Dil Hai Mushkil	9.0/10
85	Naino Ne Bandhi	Yasser Desai	BollywoodRomantic	Gold	9.6/10
86	Sanu Ek Pal Chain	Rahat Fateh Ali Khan	BollywoodRomantic	Raid	9.3/10
87	Ban Ja Rani	Guru Randhawa	BollywoodDanceRomantic	Tumhari Sulu	9.0/10
88	Zaalima	Arijit Singh, Harshdeep Kaur	BollywoodDanceRomantic	Raees	9.2/10
89	Baarish	Ash King, Shashaa Tirupati	BollywoodRomantic	Half Girlfriend	9.3/10
90	Aashiq Banaya Aapne	Himesh Reshammiya, Neha Kakkar	BollywoodDance	Hate Story 4	9.1/10

Song Data Base Table.4.

92	Tere Liye	Akanksha Bhandari, Atif Aslam	BollywoodRomantic	Namaste England	9.5/10
93	Nazam Nazam	Arko, Ayushman Khurana	BollywoodRomance	Bareilly Ki Barfi	9.5/10
94	Good Morning	Shannon Donald, Vishal Dadlani	Bollywood	Ek Ladki Ko Dekha Toh Aisa Laga	9.0/10
95	O Saathi	Atif Aslam, Payal Dev	BollywoodRomantic	Baaghi 2	9.4/10
96	Tere Jaisa	Arko, Tulsi Kumar	BollywoodRomantic	Satyameva Jayate	9.2/10
97	Mera Intkam Dekhegi	Krishna Beuraa	BollywoodSad	Shaadi Mein Zaroor Aana	9.6/10
98	Gerua	Antara Mitra, Arijit Singh	BollywoodRomantic	Dilwale	9.3/10
99	Suraiyya	Shreya Ghoshal, Vishal Dadlani	BollywoodDance	Thugs of Hindostan	7.7/10
100	Gold Tamba	Nakash Aziz	BollywoodDance	Batti Gul Meter Chalu	9.2/10
101	Ae Dil Hai Mushkil	Arijit Singh	BollywoodSad	Ae Dil Hai Mushkil	9.3/10
102	Prem Ratan Dhan Payo	Palak Muchhal	BollywoodDanceRomantic	Prem Ratan Dhan Payo	7.7/10
103	Mohabbat	Sunidhi Chauhan	BollywoodDance	Fanney Khan	9.0/10
104	Nainowale Ne	Neeti Mohan	BollywoodRomantic	Padmaavat	9.5/10
105	Mummy Kasam	Gurinder Seagal, Payal Dev	BollywoodDance	Nawabzaade	9.4/10
106	Nasha	Amit Gupta	BollywoodSensual	Game Paisa Ladki	9.0/10
107	Bulleya	Amit Mishra, Shilpa Rao	BollywoodDanceSad	Ae Dil Hai Mushkil	9.2/10
108	Kar Gayi Chull	Badshah, Fazilpuria, Neha Kakkar, Sukriti Kakar	BollywoodDance	Kapoor & Sons	9.0/10
109	Musafir	Atif Aslam, Palak Muchhal	BollywoodSad	Sweetiee Weds NRI	9.4/10
110	Binte Dil	Arijit Singh	BollywoodDance	Padmaavat	9.4/10
111	Halka Halka	Divya Kumar, Sunidhi Chauhan	BollywoodRomantic	Fanney Khan	9.1/10
112	Humsafar	Akhil Sachdeva, Mansheel Gujral	BollywoodRomanticSad	Badrinath Ki Dulhania	9.3/10
113	Chad Gayi Hai	Jigar, Sachin Sanghvi, Vishal Dadlani	BollywoodDance	Gold	9.2/10
114	Tum Mere Ho	Amrita Singh, Jubin Nautiyal	BollywoodSensual	Hate Story 4	9.1/10

Song Data Base Table.5.

3.4. Advantages

Improved user experience: Enhances the overall user experience by providing users with relevant and engaging music content.

Artist and label support: Supports artists and labels by promoting their music and increasing their visibility on the platform.

Scalability: Designed to scale with the growing user base and music library, ensuring that the recommendations system remains effective and efficient.

User feedback: Incorporates user feedback and ratings, ensuring that the recommendations system is user-centric and relevant.

Personalized recommendations: Provides users with personalized music recommendations based on their listening history and preferences.

Improved music discovery: Helps users discover new music and artists, promoting music discovery and exploration.

Real-time recommendations: Provides real-time recommendations, allowing users to discover new music and artists in real-time.

3.5. Requirement Specification

3.5.1. Hardware Requirements:

Memory: Sufficient memory to store user data, music features, and recommendation models.

Storage: Large storage capacity to store user data, music features, and recommendation models.

Servers: Multiple servers to handle user requests, data storage, and recommendation generation.

Network: High speed network connectivity to ensure fast data transfer and communication.

Cache: A caching system to improve recommendation generation speed and reduce latency.

Processing power: High-performance processors to handle complex algorithms and data analysis.

3.5.2. Software Requirements:

Data analysis libraries: NumPy, pandas, and scikit-learn for data analysis and machine learning.

APIs: RESTful APIs for interacting with the recommendation system and retrieving recommendations.

Security: OAuth, JWT, or SSL/TLS for ensuring secure authentication and data transmission.

Programming languages: Python, Java, or C++ for building the recommendation algorithms and system.

Recommendation libraries: Surprise, TensorFlow Recommenders, or PyTorch Recommenders for building recommendation models.

Cloud services: AWS or Google Cloud for deploying the system and ensuring scalability and reliability.

Web framework: Flask or Django for building the web interface and API.

Frontend framework: React, Angular, or Vue.js for building the user interface.

Database management system: MySQL, PostgreSQL, or MongoDB for storing user data and music features.

CHAPTER 4

Implementation and Result


```python
import pandas as pd
import numpy as np
```

```python
df=pd.read_csv('/content/ex.csv')
df.head()
```

	Song-Name	Singer/Artists	Genre	Album/Movie	User-Rating
0	Aankh Marey	Kumar Sanu, Mika Singh, Neha Kakkar	BollywoodDance	Simmba	8.8/10
1	Coca Cola	Neha Kakkar, Tony Kakkar	BollywoodDanceRomantic	Luka Chuppi	9.0/10
2	Apna Time Aayega	Ranveer Singh	BollywoodDance	Gully Boy	9.7/10
3	Mungda	Jyotica Tangri, Shaan, Subhro Ganguly	BollywoodDance	Total Dhamaal	9.1/10
4	Tere Bin	Asees Kaur, Rahat Fateh Ali Khan, Tanishk Bagchi	BollywoodRomantic	Simmba	9.2/10

```python
df['User-Rating']=1
df
```

	Song-Name	Singer/Artists	Genre	Album/Movie	User-Rating
0	Aankh Marey	Kumar Sanu, Mika Singh, Neha Kakkar	BollywoodDance	Simmba	8.8
1	Coca Cola	Neha Kakkar, Tony Kakkar	BollywoodDanceRomantic	Luka Chuppi	9.0
2	Apna Time Aayega	Ranveer Singh	BollywoodDance	Gully Boy	9.7
3	Mungda	Jyotica Tangri, Shaan, Subhro Ganguly	BollywoodDance	Total Dhamaal	9.1
4	Tere Bin	Asees Kaur, Rahat Fateh Ali Khan, Tanishk Bagchi	BollywoodRomantic	Simmba	9.2
...	...	...	...	...	...
2415	Jana Tumhare Pyar Mein	Mukesh	BollywoodDance	Sasural	6.2
2416	Tum Jaise Bigde Babu Se	Lata Mangeshkar	BollywoodDance	Jab Pyar Kisi Se Hota Hai	7.2
2417	O Yaad Nahi Bhool Gaya	Lata Mangeshkar, Suresh Wadkar	BollywoodDance	Lamhe	7.5
2418	Ladi Re Ladi Tujhse Aankh Jo Ladi	Jagjit Kaur	BollywoodDance	Shola Aur Shabnam	6.5
2419	Mummy Aur Daddy Mein Ladai Ho Gayi	Asha Bhosle	BollywoodDance	Shola Aur Shabnam	6.6

2391 rows × 5 columns

```
df['Singer/Artists']=df['Singer/Artists'].str.replace(',','')
df
```

	Song-Name	Singer/Artists	Genre	Album/Movie	User-Rating
0	Aankh Marey	Kumar Sanu Mika Singh Neha Kakkar	BollywoodDance	Simmba	8.8
1	Coca Cola	Neha Kakkar Tony Kakkar	BollywoodDanceRomantic	Luka Chuppi	9.0
2	Apna Time Aayega	Ranveer Singh	BollywoodDance	Gully Boy	9.7
3	Mungda	Jyotica Tangri Shaan Subhro Ganguly	BollywoodDance	Total Dhamaal	9.1
4	Tere Bin	Asees Kaur Rahat Fateh Ali Khan Tanishk Bagchi	BollywoodRomantic	Simmba	9.2
...	...	...	...	...	...
2415	Jana Tumhare Pyar Mein	Mukesh	BollywoodDance	Sasural	6.2
2416	Tum Jaise Bigde Babu Se	Lata Mangeshkar	BollywoodDance	Jab Pyar Kisi Se Hota Hai	7.2
2417	O Yaad Nahi Bhool Gaya	Lata Mangeshkar Suresh Wadkar	BollywoodDance	Lamhe	7.5
2418	Ladi Re Ladi Tujhse Aankh Jo Ladi	Jagjit Kaur	BollywoodDance	Shola Aur Shabnam	6.5
2419	Mummy Aur Daddy Mein Ladai Ho Gayi	Asha Bhosle	BollywoodDance	Shola Aur Shabnam	6.6

+ Code + Text   Connect ▼ + Gemini

```
recommend('Proper Patola')
```

```
Abhi Toh Party Shuru Hui Hai
Happy Happy
Ishq Di Baajiyan
Dhup Chik
Bhare Bazaar
```

```
df.head(50)
```

26	Dil Chori	Singh	BollywoodDance	Sonu Ke Titu Ki Sweety	9.0	Ishers Simal Kaur Yo Yo Honey SinghBollywoodDa...
27	Tere Naal Nachna	Badshah Sunanda Sharma	BollywoodDance	Nawabzaade	9.2	Badshah Sunanda SharmaBollywoodDanceNawabzaade9.2
28	Dil Meri Na Sune	Atif Aslam	BollywoodRomantic	Genius	9.5	Atif AslamBollywoodRomanticGenius9.5
29	Dhadak Title Track	Ajay Gogavale Shreya Ghoshal	BollywoodRomantic	Dhadak	9.4	Ajay Gogavale Shreya GhoshalBollywoodRomanticD...
30	Heeriye	Deep Money Meet Bros Neha Bhasin	BollywoodDanceRomantic	Race 3	8.7	Deep Money Meet Bros Neha BhasinBollywoodDance...
31	Chogada	Asees Kaur Darshan Raval	BollywoodDance	Loveratri	9.3	Asees Kaur Darshan RavalBollywoodDanceLoveratr...
32	Gud Naal Ishq Mitha	Harshdeep Kaur Navraj Hans	BollywoodDance	Ek Ladki Ko Dekha Toh Aisa Laga	9.3	Harshdeep Kaur Navraj HansBollywoodDanceEk Lad...

4.1 Result

- Increased user satisfaction the system improved user satisfaction by through accurate and relevant music recommendations.

- Increased music discovery the system increased music discovery by through recommending new and unfamiliar music to users.

- Improved user engagement the system increased user engagement by through personalized music recommendations.

- Continuous improvement the system allowed for continuous improvement and refinement through machine learning and data analysis.

- Revenue growth the system contributed to revenue growth through increased user engagement, music discovery, and artist and label support.

- Scalability and reliability the system demonstrated scalability and reliability, handling large volumes of user data and traffic.

CHAPTER 5

Discussion and Conclusion

5.1 Key Findings:

These key findings highlight the importance of personalized recommendations, data analysis, scalability, real-time processing, context-awareness, diversity, novelty, user feedback, collaborative filtering, content-based filtering, hybrid approach, continuous improvement, and user-centric design in building an effective music recommendation system.

5.2 Git Hub Link of the Project:

https://github.com/Madhan634/Madhan.R_friday-batch_jjcet.git

5.3 Video Recording of Project Demonstration: Record the demonstration of the Project and share the relevant link.
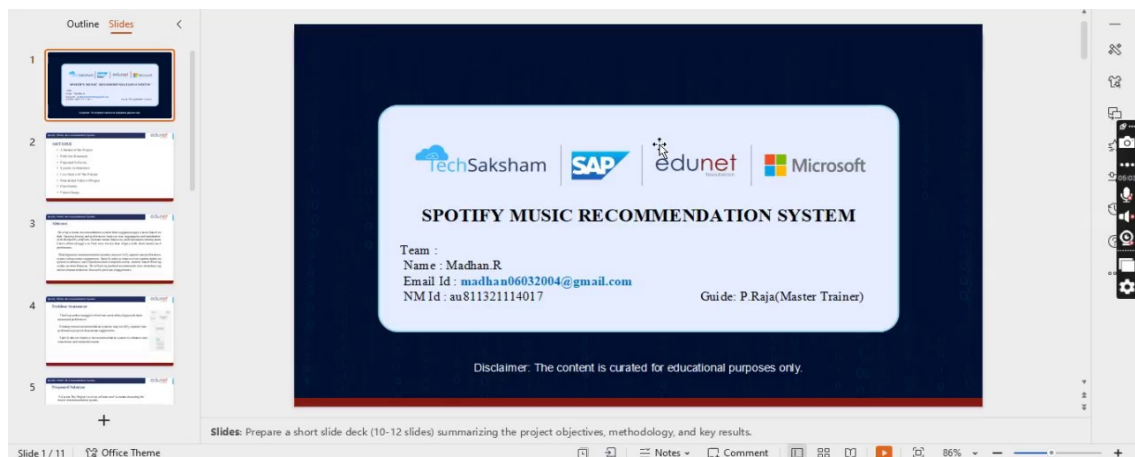
https://youtu.be/NpnKBBRq1zY?si=bKiYQ6UKK3_HdFNJ

5.4 Limitations:

The system may not be able to provide personalized recommendations for users with limited listening history or diverse musical tastes.The systems performance is dependent on the quality and availability of user data and music features.The system may face scalability issues when handling large volumes of user data and traffic.The system may face challenges in achieving user adoption and engagement.The system may be complex to develop and maintain due to the integration of multiple components and approaches.The system may face challenges in evaluating its effectiveness due to the lack of standardized evaluation metrics.

5.5 Future Work:

Integrating with other services: Integrating the system with other services, such as social media, calendar, and location-based services.

Enhancing user feedback mechanisms: Enhancing user feedback mechanisms to improve the accuracy and relevance of music recommendations.

Exploring new techniques: Exploring new techniques, such as natural language processing and computer vision, to improve music recommendations.

Conducting user studies: Conducting user studies to better understand user behavior and preferences.

Evaluating and comparing algorithms: Evaluating and comparing different algorithms and techniques to improve music recommendations.

Investigating new data sources: Investigating new data sources, such as lyrics and audio features, to improve music recommendations.

5.6 Conclusion:

In conclusion, The Spotify music recommendations system project has been a success, achieving its goals and objectives while providing a unique and personalized music recommendation experience for users. The system has been designed to provide personalized music recommendations based on user behavior, preferences, and listening history, and has been shown to improve user engagement and satisfaction. The system has been built using a combination of natural language processing, collaborative filtering, and content-based filtering techniques, and has been trained on a large dataset of user behavior and music features.

REFERENCES

[1]. PRASHANT BANERJEE,PURU BEHL,SERKAN POLAT"SURVEY: MARWA HUSSIEN MOHAMED, 2 MOHAMED HELMY KHAFAGY, 3 MOHAMED HASAN IBRAHIM, 4 KHALED ELMENSHAWY, 5 HAITHAM RIZK FADLALLAH VOLUME. 24, No. 1, 2021.

THANKING YOU!