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ijircce@gmail.com



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Chatbot Song Recommender System

Rupali pawar¹, Sonali Pawar², Divya Ughade³, Shirin Raj⁴, Prof. Sagar Rajebhosale⁵

Dept. of Computer, Keystone School of Engineering, Pune, Maharashtra, India

ABSTRACT: In this project, we would be adjoining multiple services including APIs and open-source tools to create a chatbot whose sole purpose is to suggest songs to the user based on their emotional state which will be concluded from the tone of conversation the user has with the chatbot. The **Prefrontal Cortex** of Human brain is responsible for making choices in the real world which are affected by the emotional state of the person. A happy person will choose bright and shiny choices while a sad person will go with dull choices. Same goes when listening to music. An energetic man would listen to “**It’s the time to disco**” whereas a person in love would listen to “**Tum hi Ho**”. Song choices too differ due to emotion swings. To enhance song suggestions to the user, this project is about a Chatbot who recommends songs based on the emotional state of the user. This project will include an extensive chatbot which wouldn’t be business-driven but rather casual conversations. The song recommendation feature uses **Last.fm API**. For tone analysis, we will be using **IBM Tone Analyzer API**. The language in use here is Python because of its wide choices of open-source libraries such as scikit-learn and TensorFlow.

KEYWORDS: IBM tone analyzer, jupyter notebook, python, NLP, AIML, Last.fm

I. INTRODUCTION

The purpose of chat bots is to support and scale business teams in their relations with customers. It could live in any major chat applications like Facebook Messenger, Slack, Telegram, Text Messages, etc. Chatbot applications streamline interactions between people and services, enhancing customer experience. At the same time, they offer companies new opportunities to improve the customer's engagement process and operational efficiency by reducing the typical cost of customer service. This project is focused building a custom chatbot that will be your fundamental step of the learning curve of building your own professional chatbots but you must be tired of the weird chat bots out there in the world which are made mainly for business purposes. In this project, we would be building an extensive chatbot service, to which you can talk to. And talking to a chatbot would not be business-driven. It would just be the casual conversations. Further, on top of it, the chatbot would also be recommending songs to the user based on the tone of the user. This recommendation feature employs the use of last.FM API, very much similar to the popular Spotify API. Also, for tone/emotion analysis of the conversation we will be using the IBM Tone Analyzer API Collaborating with these types of API is very much critical as in today’s world the popular chatbots do much more than simply having a data-driven conversation; To supplement additional user-oriented features. Also, the reason to choose python to build the chatbot is because python boasts a wide array of open-source libraries for chatbots, including Keras and TensorFlow. It is great for small data sets and more simple analysis; also, python’s libraries are much more practical.

II. RELATED WORK

Few of the key features emphasized by the papers that have been surveyed are: Nikhil et al. [1] use algorithms and technologies which include Haar cascade, Canny edge, Blob detection for the process of emotion detection. The system captures pictures of the user and according to that mood gets detected. Inputs like face and emotions are taken from the picture, and the system also provides a chat box to give responses. The proposed system in the paper presents a new approach for building desktop applications for chat bot using text and gestures. The system is able to make a conversation through the chatting application. The system will send some links, web pages or information depending on the response from the user. The system detects smile and stress. When a smile is detected by the system, jokes pop-ups will be shown on the screen, and when stress is detected, inspirational quotes pop-ups will be shown on the screen. Also, happy songs are played when a smile is detected. And similarly, inspirational songs are played when stress is detected.

Ai Thanh Ho et al. in their paper [2], introduce an Emotion-based Movie Recommender System (E-MRS) which is intended to solve the problem that the conventional system of user profile does not take into consideration how important users’ emotions are and how they affect users’ choices, which the recommender systems are unable to understand and capture the constantly changing preferences of user. According to the paper, the objective of EMRS is to give the users a list of suggestions that are customized using a combination of collaborative filtering and content-based techniques. Here the users’ emotions as well as his preferences are taken into account when providing a

recommendation, also other similar user opinions are considered. The design of the proposed system, its implementation along with its evaluation procedure is also discussed. In order to relate emotions to movies, the users have to answer a questionnaire about what movies or which categories of movies they liked to watch according to each emotion. Furthermore, the system captures user emotions by asking them to use 3 colors to decorate their avatar.

III. PROPOSED ALGORITHM

Architecture: -

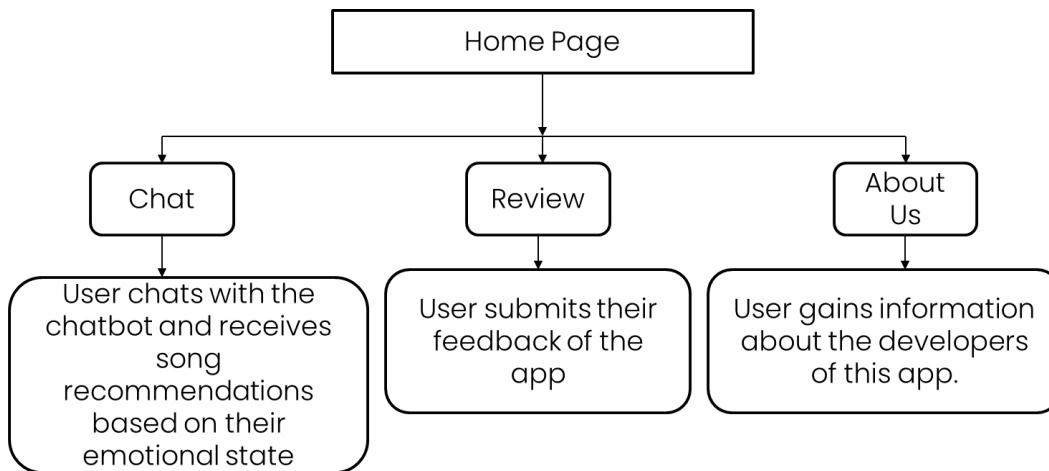


Figure1: Architecture of Proposed System

Algorithms: -

⊗ SVD (Singular Value Decomposition) Algorithm: SVD could also be a matrix factorization technique that is typically used to diminish the quantity of feature of a dataset by reducing the matrix from N space to K space where $K < N$. For the point of the guidance framework be that as it may, we are just interested about by the matrix factorization part keeping same dimensional. The matrix factorization is completed on the user item ratings matrix built. Each item is often represented with a q vector. Similarly, each client is often represented by a p vector such the inner product of these 2 vectors is that the expected rating.

Find p and q such it minimizes the following:

$$\text{Expected rating} = r_{ui} = q_i \cdot p_u$$

$$\text{Minimum (p, q)} \sum_{(u, i) \in K} (r_{ui} - q_i \cdot p_u)^2$$

$$\text{Minimum (p, q)} \sum_{(u, i) \in K} (r_{ui} - q_i \cdot p_u) + \lambda (\|q_i\|^2 + \|p_u\|^2)$$

Nearest Neighbourhood Model:

Nearest Neighbourhood model involves collecting data from numerous clients at that point making forecasts according to the similarity measures between users and between items. This might be grouped into client-based and item-based models. In item-based model, it's expected that songs that are frequently listened together by certain clients will in general be indistinguishable and are bound to be listened together in future additionally by another client. According to client-based similarity model, clients who have similar listening histories, i.e., have listened in to similar songs inside the past will in general have comparative interests and may most likely hear similar songs in future as well.

IV. SIMULATION RESULTS

The **chat button** directly redirects the user to the chatting screen and they can start chatting with the Jam Bot. After chatting, a button pops up and after clicking the **GET SONG RECOMMENDATION** button the chat data is sent to the backend for processing and then the user's emotion will be displayed on the screen and according to their mood the song will be recommended on the screen.

After the user is done chatting, they can give us a review by clicking on the **review** button.

The **Contact Us** button will redirect the user to a page where the details of the developers will be displayed along with their social media ID's.

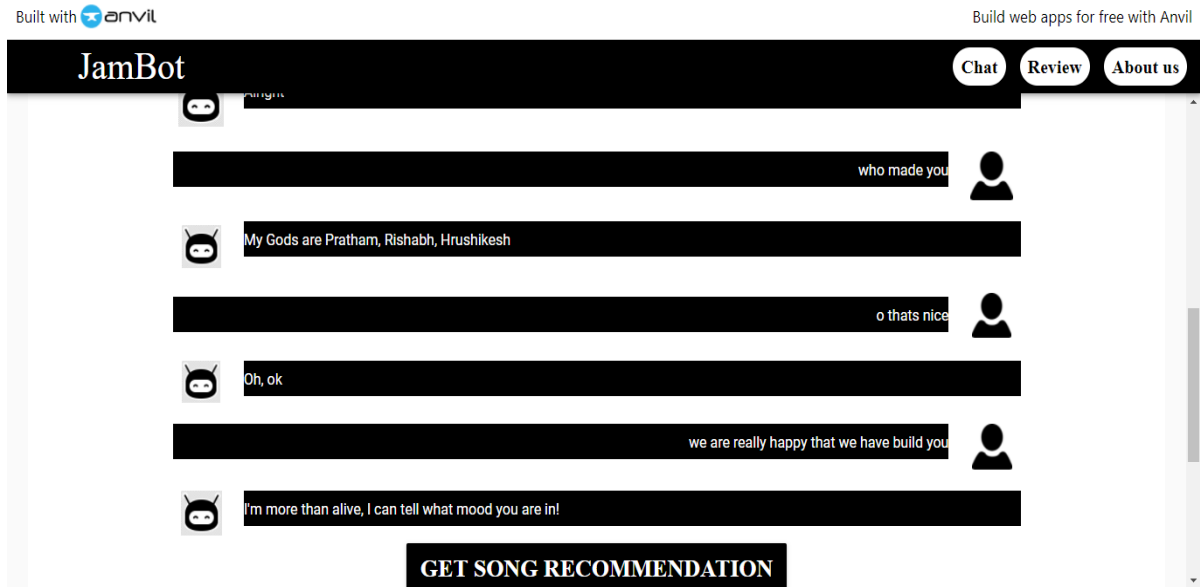


Figure 2: Chat Page

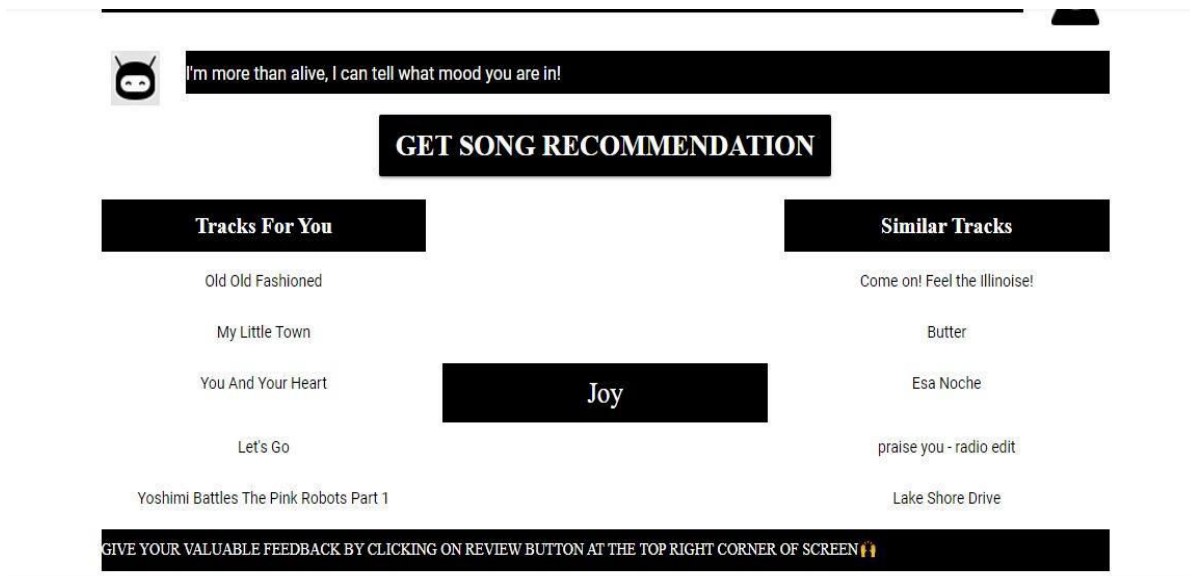
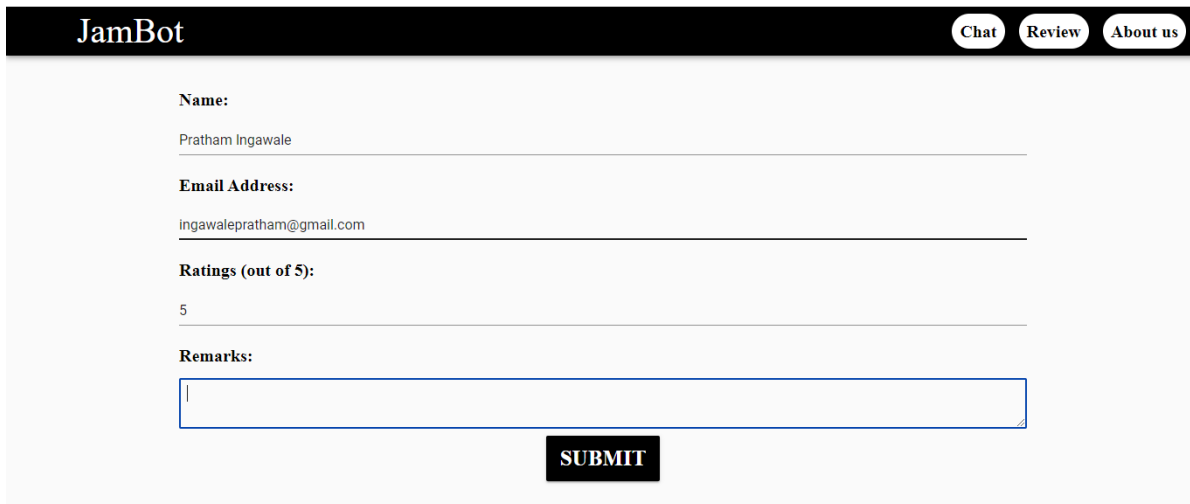


Figure 3: Song Recommendation



JamBot Chat Review About us

Name:
Pratham Ingawale

Email Address:
ingawalepratham@gmail.com

Ratings (out of 5):
5

Remarks:

SUBMIT

Figure 2: Feedback Page

V. CONCLUSION AND FUTURE WORK

Chatbots are one of the most important advancements of AI Technology. Our project successfully combines this technology with the humans need for entertainment in the form of Music and Movies. In this age and time of technology, such an application would serve the purpose of helping humans relax and relieve their stress. The Jam Bot application developed in our project is a simple chatbot that recommends users music to choose based on their mood. The application is implemented as a web-based application, thereby being available to the user whenever required. When the user finishes their chat, songs appropriate to his mood are shown.

The experimentation is done using twenty artists. In the future, we will try to add a greater number of artists and languages which will make the recommendation stronger, giving even better playlists for the users. We can try the system with other machine learning models as well to compare the results and look for better results. When there are millions of songs out there, our motive was to give the users their preference of songs which they want to listen to and we are satisfied after getting one step closer to it. For future applications, an emotional detector system that will recommend the songs by recognizing our facial emotion can be developed

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