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Survey Paper

A Survey of Music Recommendation System for old age people

Samya Das[1], Souvik Sikdar[2], Soham Dey[3], Radha Krishna Jana[4*]

[1,2,3]Department of CST, The Calcutta Technical School, Kolkata, India
[4]Department of CSE, JIS University, Kolkata, India

Corresponding Author: radhakrishnajana@gmail.com

Abstract: One of the most fruitful forms of media is music since it can evaluate strong emotions and marshal listeners with subliminal instructions. It manipulates our feelings, which in turn affects how we feel. Books, movies, and television are a few other ways to communicate, but music communicates its message in just a few brief seconds. It can encourage us and help us when we are down. We frequently experience a mood when listening to depressing music. We experience happiness when we listen to music. Many Internet businesses have looked for using sentiment analysis to recommend content that is in keeping with the human emotions that are represented in informal texts posted on social networks. Here we propose a music recommendation methodology.

Keywords: Collaborative filtering, Content based Filtering, Recommendation System.

1. Introduction

Music has many benefits. Associated with it many people can enjoy their lives, such as improving people's moods, bringing back memories of earlier, and promoting their overall mental and physical health. There are many benefits of music for older adults, such as improving their moods, bringing back memories of happier times, facilitating socialization, and promoting their overall mental, can work as a stress buster and physical well-being and also bring happiness in their lives. It's important to choose music that will improve the quality of life for seniors if you're a career, such as music that is motivating or positive. For seniors who have age-related memory issues—or even dementia—music has the power to bring back memories and help them. [3] Moreover, music can also contribute to the slowing of ageing-related by improving the speed at which ageing adults can process information. Music can also have a positive emotional effect on seniors, providing comfort and soothing stress and helping them with their well-being.[5] It can also help seniors stay engaged and active in their daily lives. Music can also improve communication and socialization skills in seniors, making their way of life easier for them to connect with others. Additionally, music can also provide a platform for seniors to express themselves and create a sense of recreation. Music also serves as a form of enjoyment, allowing seniors to revisit memories of their past and recollect memories. This can bring them joy with a reduced stress and thus creating happiness in their lives and can make their life joyful.

A recommendation system is a filtering system, the purpose of which is to predict the preference that a user would give to a particular element, in our case, a song and also to remember their choices. [5] It is a core of huge engines that work with certain recommender algorithms and suggest a single item or a set of items to users based on such predictions the songs are recommended. Whether we are aware of it or not, many of renowned recommendation systems have become an important part of our daily routine in recent years and help them find a perfect match for them. Starting from accurately targeted advertising product suggestions and finishing with personalized video or music playlists compiled specifically for us, album recommendation engines seem to be encompassing our everyday lives from literally every corner of digital space. A phenomenon these days, TikTok is built all around the song recommendation engine; that's why TikTok's algorithms are considered unique and are promising many more opportunities to the creators to grow organically, or in other words, with the help of recommender system algorithms the market is widely growing and are in huge demands.

A music recommender solution is essentially a solution that allows music streaming platforms to offer their users relevant music recommendations in real-time. It provides personalization and thus boosts user engagement and interest. The recommender system is helpful to both service providers and users. It saves time for the user in finding and selecting the perfect song, and at the same time, it also helps service providers retain customers for a longer time on their platform and thus making the interest and keep the user motivated.

2. Related Work

These are the literature survey which is based on different research paper that related to our own project "Music recommendation system ".

Author [1] Recommend a music recommendation system, which includes music genre cataloguing, music emotion classification and music similarity query functions. The AdaBoost algorithm successfully chains a novel way for extracting tempo features with traditional timbre features, greatly enhancing the classification accuracy of music. In addition, their system adopts an effective similarity query approach based on the outcomes of music classification.
Author [2] Recommend a music recommendation system, which includes evaluated to the conventional brute-force searching method, the high precision of music classification yields a enhanced recall rate and faster queries. Author employed techniques such as Canny Edge Detection, Viola Jones Algorithm, SVM, and others in this paper. The replication in this case was successfully completed on numerous Android devices that were online and running version 5.0 or above of the operating system. The SFFS method is used to select noteworthy musical elements from passionate musical compositions. SVM classifiers are guided using the chosen features for a specific person.

Author [3] Recommend a music recommendation system, which is made by using KNN Algorithm where the data of the user is stored and analysed to invention of the next match for the perfect fitted song, but the main drawback is that the music system does not have a seamless balance of balance and lacks the attention of the user thus the performance is not made to the proper use. This system also lacks proper security reasons and also that the information is not encrypted and stored with proper security. Moreover, the algorithm is not preferred due insecurity of personal data. So foreign threats may get the data and the data may get some security threats and so by analysing.

Author [5] Recommend a music recommendation system, it is essential to provide efficient estimation metrics for music recommendation systems. Commonly employed metrics comprises of precision, recall, F1-score, and normalized discounted cumulative gain (NDCG).

Author [7] Recommend a music recommendation system, in situations like online streaming platforms, session-based recommendation focuses on predicting customer preferences based on their activity during the current session.

3. Theory/Calculation

As we know that music is very important for the old age people and since they have hardly any work to do and spend their time therefore the music recommendation system will be a great work to adopt with their needs and to make their work easier, we will also make the music system in such a manner that they will only acquire recommendation of the types of song they usually listen.

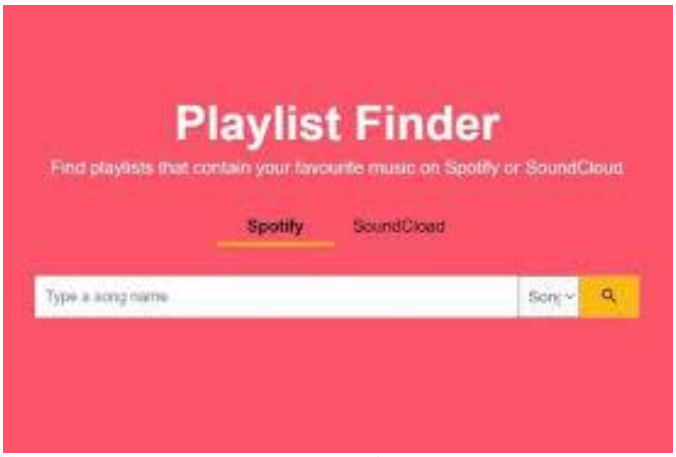

Fig 1: playlist finder

The system is composed of a song which globally searches the music and finds out that what kind of song the finder wants to listens and then the website gives the result accordingly. We will suggest many likely songs that the user listens.[4]

There are 2 most popular recommendation systems:
a. content-based (recommendations based on the similarity of content or, in our case — attributes of two songs)
b. collaborative (recommendations based on similarity of users' preferences and using matrices with ratings for each content piece, in our case — a song)
The content-based approach is dependant on the similarity of particular items. While using a streaming music service, a user puts likes or dislikes on the songs, creating playlists and make out favourite song and pin then on top. The main idea of a content-based recommendation system is to extract keywords from the description of a song that a user likes, compare them with the keywords from the other songs, and based on this, recommend similar songs to the user on their likes and favourites and also the most time listened.

In turn, a collaborative system is built based on users' overlapping preferences and ratings of songs based on the time listening of the particular songs. It assumes that if user A and user B express similar preferences, similar songs can be recommended to them, meaning that if user A likes a particular song, it is likely that this song will also appeal to user B and vice versa then they can form collaboration also. Collaborative recommendation systems are generally considered more accurate and according to their needs, as they rely on direct user interactions with the system versus content similarity and also with the user's choice.

As we have already mentioned, these recommendation systems do not require any additional actions on the user's side and are simple to use. A person simply installs the application and registers, listens to his favourite songs, makes playlists... And the more data we have about his preferences, the more accurate our song recommendations to him become and help to fulfil their choice. It means that as the accurate grow; algorithms will grow, a user will enjoy music and will be satisfied with a music service even more and will use our app more.

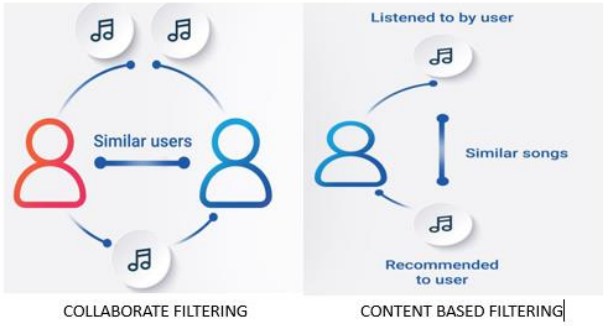

Fig 2: Collaborative and Content based Filtering.

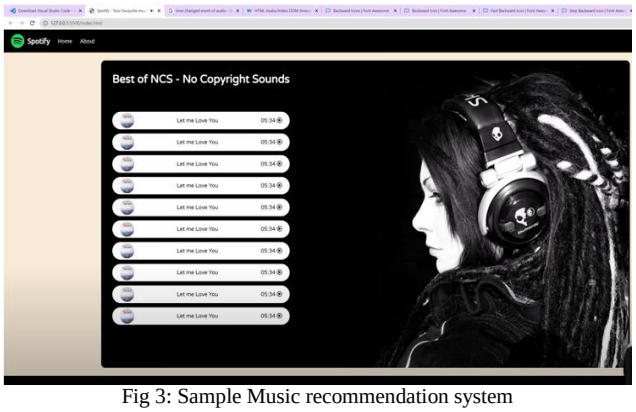

Fig 3: Sample Music recommendation system

A music recommendation system offers several benefits to both users and music platforms, improving the overall music discovery and listening experience. Here are some of the main benefits.

Advanced Music Discovery: Music recommendation systems help users discover new songs, artists and genres they may not have encountered or listened earlier in their lives. It encourages exploration and broadens their musical tastes and also they may find some more favourite songs as well as some other singer may highlight in their choice of favourites.

Personalized experience: These systems analyse a user's listening history, preferences, and behaviour to provide personalized recommendations and also store their search history to find more about them. This personalization ensures that users receive content that matches their individual tastes and helps to recommend according to their choice.

Time Efficiency: Instead of manually searching for new music, users can rely on recommendations to quickly find songs they're likely to like and can also avail the feature of auto play which is present in our project. This saves time and effort, making the music discovery process more efficient and accurate in an easy manner.

Increased engagement: By providing relevant content, music recommendation systems keep users engaged and returning to the platform and make a important part in their lives. This can increase user retention and increase time spent on the platform and can make their lives happy and will also help user to enjoy their lives.

Diverse exposure to content: Users is exposed to a greater range of music styles, artists and cultures, promoting a more diverse and complete listening experience and to discover some more favourite songs or artists or albums which were unknown to them.

Support for emerging artists: Referral systems can highlight lesser-known artists and independent musicians, giving them visibility and the opportunity to reach a wider audiences well as they can get fames and wider resignation through the users providing their renounced work a place to highlight their talents.

Satisfaction and User Happiness: When users find music that gives them a perfect fit, they experience greater satisfaction and enjoyment, resulting in a positive user experience.

Cross-Promotion and Marketing: Music platforms can use referral systems to promote new releases, curated playlists and featured content, increasing engagement and potential revenue and can also highlight some great works of some artist from our project giving them a platform to get known in the market.

Data-driven insights: Music recommendation systems generate valuable insights into user preferences and behaviour that can be used to improve content curation, marketing strategies and the platform to highlight their works as well their names to introduce to the users.

Custom playlists and mixes: Recommender systems can create personalized playlists and mixes based on a user's mood, activity or time maintaining their privacy and also their security if needed. This adds convenience and versatility to the listening experience and also stay free from worried about their security.

Longer user sessions: Activating recommendations can encourage users to spend more time on the platform, increasing the likelihood of discovering more content and using other features and listing the songs of their choice as well as their likes. It also make a way for new artists to make an impact to their listening and take a place in the minds of the users

Reduced Decision Fatigue: Due to the large amount of music available, users can be confused about what to listen to. Recommendations ease this burden by providing them with choices based on their preferences and to listen only the songs of their choices and avoiding songs which are not of their tastes.

Continuous Improvement: These systems can incorporate user feedback and interactions to improve their recommendations over time, becoming more accurate and relevant. This could help in future recommendation suggestions and help to remember the choices of the user.

Competitive advantage: Music platforms that offer high-quality recommendation systems can get a competitive

advantage by providing an exceptional and set apart user experience.

Overall, music recommendation systems create a win-win situation, increasing user happiness and engagement, and providing effective insights and opportunities for music platforms to grow and succeed.

Although music recommendation systems offer many advantages, they also have certain disadvantages and challenges. Here are some possible disadvantages:

Filter bubble effect: Recommender systems can accidentally create a "filter bubble" where users only see content that matches their current preferences. This can limit their exposure to different genres and artists and hamper their ability to explore new music.

Lack of serendipity: Sudden discoveries, where users discover upon unexpected but enjoyable music, can be reduced because recommendation systems prioritize known preferences.

Overemphasis on popularity: Algorithms often favour popular and majority content, potentially overlooking lesser-known or emerging artists who deserve more attention. Limited user control: Users may feel that their choices are dictated by algorithms, resulting in them losing control of their music listening experience.

Privacy Issues: In order to provide personalized recommendations, these systems requires to access to user data, which can create privacy issues if not handled properly. Users may feel uncomfortable and may get an insecurity with the amount of data collected and used if not taken care of.
Incorrect recommendations: Recommendation algorithms may not always accurately understand user preferences, resulting in dull or unsatisfactory recommendations which affects the popularity and the effectiveness of the music system.

Echo chambers: Like a filter bubble, recommendation systems can encourage the creation of echo chambers by emphasizing existing beliefs and preferences without displaying users to different perspectives.

Reliance on historical data: Recommendations are often based on a user's past history searches, which may not reflect their current mood or changing tastes.

Complex algorithms: Developing and sustaining effective recommendation algorithms requires significant technical expertise and resources, which can be difficult for smaller platforms. With all the needs and all the requirement needed to fulfil the needs, an advanced algorithm is a must need.

Niche Tuning Exclusion: Users with specific or unique musical tastes may difficult to find content that truly resounds with them if the system focuses primarily on mainstream trends.

Loss of the joy of exploration: The thrill of manually exploring music and finding hidden gems may reduce as users rely broadly on algorithm-generated recommendations.

Bias and Stereotypes: If recommendation algorithms are not carefully designed, they can accidentally reinforce cultural preferences and stereotypes in recommended music.

Implications for artistic creativity: Recommender systems may prefer formulaic or commercially productive music over experimental or creative works. This may decrease the listening time of the user.

Unexpected User Reactions: Users may react in a negative way to feedback that challenges their presumptions or introduces unknown styles, causing disturbance or dissatisfaction.

Disruption of traditional music discovery: Some users may prefer traditional methods of music detection, such as recommendations from friends, DJs or soundtrack labels, and may feel withdrawn from these methods by algorithmic recommendations.

To mitigate these limitations, it is important that music recommendation systems strike a equilibrium between personalization and variety, spotlighting user's privacy, and enabling user control and customization. Continually improving algorithms and integrating user feedback can help address some of these challenges.

Recommendation Application

A music recommendation system is necessary if you want to:

a. Improve customer participation and satisfaction.
b. Personalise user's platform as much as possible.
c.provide customers with a compelling and immersive running experience.
d. Develop your users' hearing skills and trust.
e. Make it simple to use user's facility so that users don't have to spend time looking for new tunes and save their time.
f. Increase subscription and sales rates involving income structures.
g. Boost CTR and change while decreasing churn rate.
h. Encourage cross-marketing and upselling.
I. automates playlist construction and audio curation.
J. Gain understanding of user behaviour to inform user's data-built on marketing decisions.
Swedish company Spotify is now counted as the king of the music commerce, as its streaming service has become one of the main sources of income for artists and labels. The value of establishing a recommendation system to the service cannot be ignored, as it has had a enormous impact not only on the Spotify business, but also on the music commerce as a whole.

First, algorithms that suggest music based on listening experience, rather than top artists, help to some extent solve the problem of unfair distribution of royals. Before MRS,

audience member wanted to listen to famous top girlfriend artists and songs. As a result, there was no prospect of learning up-emerging-coming artists. With the help of MRS, Spotify has updated music based on users' tastes, moods, and emotions, creating new prospects for industry insiders and listeners similarly.

Second, by collecting complete data about your viewing habits, Spotify can trade that data to advertisers. This is of great value to all market members, including labels that license music for streaming services. This data look after the industry with insight into listener habits, how they ingest music, and other enjoyments. This magnificent privilege has put Spotify in a leading position in the music industry as a whole. Spotify presently has over 100 million users. New Discover Weekly playlists will be released to their individual playlists on Mondays. Spotify is contemplated the number one streaming service, and its song recommendation algorithms are highly accurate.

Want to discover more about how one of the best music recommendation systems works, and what's the key to such exact and personalized playlists.

In fact, Spotify didn't develop a new algorithm, but combined his three best algorithms used in the field. The result is a powerful and exceptional mechanism for generating a highly perfect list of recommendations.

Thus music recommendation system is a extensively used company which helps us to recommend songs and also preserve the interest of the user and also

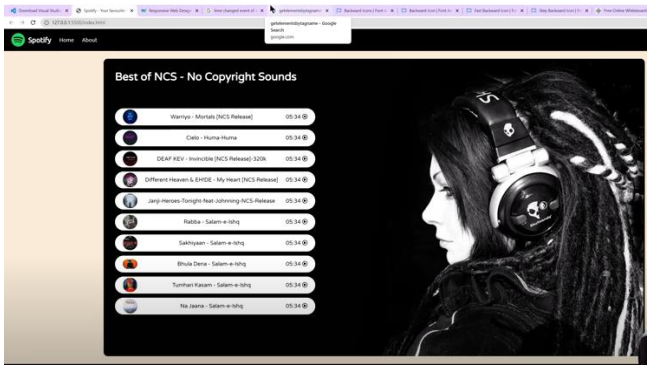

Fig 4: Recommending song.

4. Experimental Method/Procedure/Design

In this experiment, we use collectively filtering to create a music recommendation system. This means that we only use the user's past favourites for song sets.

Step 1. Import the data we need. We will exploitation a public dataset of songs that holds information about popular songs. First, let's import the required libraries into Notebook. Load data from public data and eliminate duplicates from song data.

Once we have loaded all the data we need to, join them together to get an outline of songs and users. Data mining is an valuable part of any project linking machine learning or data science. Let's take a closer look at the dataset. Let's see how many unique songs there are in our dataset. How many users unique he has in the dataset:

Step 2. Get stats for top 10 most played songs and artists.
Check out the top 10 most played songs and obtain the stats in a graph. To do this, introduce the required libraries. Now let's grab this top list from the dataset and graph it. And here is the subsequent graph. Now let's find the 10 most popular artists in the dataset.

Step 3. Prepare our data.
To go further, we need to recognize how many songs users listen to on common in order to discard inappropriate data. Here, the median was found to have 16 songs he listened to. Let's select users who have listened to at least 16 songs. Convert the data frame to a pivot table. Now that we have the song ID instead of the title, let's adjust those values.

Fig 5: our proposed app

Step 4. Choose an Algorithm and Build a Model

We will create an algorithm, and which will recommend the type of song listened by the peoples and will automatically recommend the next song and will continue playing some songs until our app is turned off. We will emphasise in this algorithm that the user's search results are saved in the search and retained for a predetermined amount of time, such as months, and that the data is then analysed to provide and recommend songs appropriately. We'll also limit it to a particular tongue because if people don't hear music in the languages they know or want to hear, or if they don't hear songs in other tongues, they'll get bored. Additionally, we will create an algorithm that will suggest songs based on

listeners' moods. The algorithm will begin playing the song as soon as they merely mention their mood.

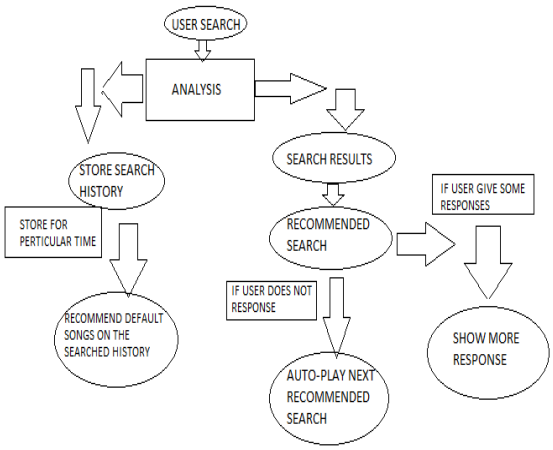

Fig 6: DFD of the Proposed system

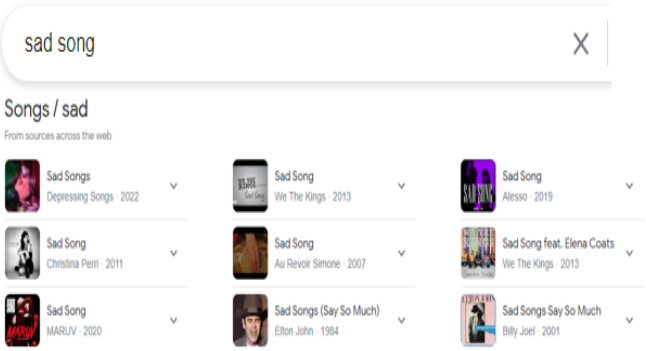

Fig 7: Sample output on Mood Search

5. Results and Discussion

Thus, in the experiment we are trying to show how to make an efficient and effective way to make a perfect music recommendation system. In this experiment we also highlight some major drawbacks and advantages of using different music recommendation systems. Since music recommendation system is almost a need for every music application, thus making it a widely studied section and researched area.in this research we have described how a best analytical as well as a perfect match for a system can be made using a simple algorithm.

6. Conclusion and Future Scope

This project will be of great benefit to the elderly who are very lonely in their lives and this project will help them to spend a better life. Add a source of entertainment to your life Like other modes of recommendation systems, modern music recommendation systems are based on machine learning and artificial intelligence. Using this data, we can merge models to develop customized solutions for your specific business case. We have created the app in such a way that they will only obtain their suggestion for the songs they listen the most and will also have the support of autoplay. We have made the app responsive, so we obtain the app on every device. The app will be easy to handle and will be very simple. They can also search the song according to the mood and they will get recommendation from the best results found on net. They will also be able to get the option of auto-play if they want, they can hear songs and will keep on listening until exit the app.

The next step is to conduct a full evaluation of extensive research investigating benefits and effects Impact of our system on certain social behavior Symptoms such as people with dementia Diseases correlated with aging. we also want to continue We develop the system according to our requirements in the field of gerontology. We believe that this adds the usage of personalized music The system can promote and promote well-being Communication with people through dementia caregivers in nursing homes and facilities House. We are also thinking for building a mobile application on this project. We would also like to add emotional gesture adaptiveness system in this project. We will also add an emergency call option if the old people does not respond for a prolonged period. In our next project we would also like to develop an system of music recommendation system where the data can talk to A.I. and the A.I will communicate with them to understand the mood of the user and will also cooperate the songs accordingly.

Data Availability (Size 10 Bold)

No data is available.

Conflict of Interest

Do not have any conflict of interest for this research work.

Funding Source

No funding source is used by this paper or for this research work.

Authors' Contributions

Author-1 researched literature and conceived the study & develop the overall planning of this paper. wrote the first draft of the manuscript. And also made the website plannings and also have planned to build the effective algorithms. Has also collected data and analysed and made a comparative study to make the project and also have made it possible for everyone to gather the valuable resources. Has make a detailed study and also made the necessary changes where applicable.

Author-2 involved in development, gaining ethical approval, and data analysis. Has a vital role in helping and made a coordination among other authors to make and complete the project.

Author-3 wrote the first draft and gave a planning of how to start the project. All authors reviewed and edited graph development, gaining approval, and data analysis and create the final version of the manuscript. Has made the final changes and also build a sample website. Moreover the authors are very much thankful to him because of the sample designs and the sample documents provided by him

Author-4 Reviewed and edited the manuscript and approved the final version of the manuscript.

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AUTHORS PROFILE

Short Bio: Hi my name is Souvik Sikdar, I am a student pursuing diploma in Computer Science and Technology at the Calcutta Technical School. I have a strong interest in programming, algorithms, and machine learning, artificial intelligence, and computer vision. My research interests also lie in the field of cybersecurity, particularly in the analysis of security risks associated with IoT devices. I have worked on projects related to IoT security and presented my work at technical conferences. I am also participated in cybersecurity seminars. I also enjoy participating in coding competitions. I have participated in programming competitions and also completed various online courses on computer science topics. I am passionate about using technology to solve real-world problems and hopes to contribute to the field of computer science through his research. In my free time, I enjoy exploring new technologies and conducting research on emerging cybersecurity threats and reading books and exploring new programming languages.

Short Bio: Hello, my name is Soham Dey, I am a student recently studying diploma in Computer Science and Technology at the Calcutta Technical School. I have a very keen knowledge as well as interest in programming, implementing various algorithms and computer vision. My research interests also extend into the field of machine learning using Python as well as Smart Home Automation using Internet of Things (IOT) devices. I have also been a part with various institutes and have also attended various meetings via the online platform to gather immense knowledge about my research. At my leisure time, I love to enjoy exploring new technologies and conducting research on newly upcoming software and also last but not the least , reading books and exploring new programming languages is one of my favourite hobbies also .

Short Bio: Hello, my name is Samya Das, and I attend the Calcutta Technical School to pursue a diploma in computer science and technology. Programming, algorithms, machine learning, artificial intelligence, and computer vision are all areas in which I'm quite interested. My interests in the subject of cybersecurity extend to the examination of security concerns related to Internet of Things (IoT) devices. I've worked on IoT security projects and presented my findings at professional conferences. I have also attended workshops on cybersecurity. I also like competing in coding contests. I've taken part in programming contests and finished a number of online courses on various computer science subjects. I'm passionate about leveraging technology to address pressing issues, and I want to have a positive impact on the field of computer science.

Short Bio: Earned B.E and MTech from Burdwan University and Jadavpur University and pursuing Ph.D. in Computer Science and Engineering from JIS University. His research area includes.
Social Network Analysis, AI in Medicine & Healthcare, Big Data Analytics in Healthcare &Medicine. Mr. Jana has 19 years' rich experience in teaching, research and industry. He has authored more than 40 papers in the referred Journals and Conferences. He published one book also. He is a life member of Indian Society of Technical Education and Member of Institute of Engineers (India).

