AVISHKAR '20

SOFTABLITZ PROBLEM STATEMENTS

B.Tech 2nd, 3rd year And MCA 2nd year

Facebook: https://www.facebook.com/groups/softablitz

Contact Us:

Shrey Pandey	Shashwat Pandey	Suraj Goel
Arsh Singh	Anuj Modi	Sahaj Bamba
Manas Uniyal	Nitish Gupta	Prajjawal Prayank

BASIC INSTRUCTIONS

1. A team can consist of at most 3 members.
2. All branches are allowed, but each team must have at least 1 member from either CSE or IT. Cross year teams are not allowed.
3. Plagiarism in any form will result in elimination.
4. **Teams are allowed to attempt a maximum of two problem statements. If your first problem statement is complete then only we will consider your second problem statement for scoring. In short we will not be considering 2 incomplete projects for scoring. In any case we will be evaluating all your work and giving feedback.**
5. Bonus points will also be awarded if the team implements features other than the one specified.
6. Use of git and github is compulsory and holds good weightage of score

FEW PIECES OF ADVICE

1. Firstly read each and every problem statement and then decide which one suits best with your current skill set.
2. Try to build a complete solution for the problem that you are attempting. In this way you will have a project worth mentioning on your resume.
3. Point 4 above clearly states that even for winning you need to have at least one complete project with all the features mentioned.
4. First try to implement as many features as you can. In case you get time after this, then only spend time polishing UI. Remember an application with very good UI but minimal functionality is useless. It is just like, "Naam bade par darshan chote". You won't be getting any marks for UI although we may use it as tie breaker.
5. Remember to keep the spirit of Softablitz ablaze by not using libraries to implement features unless specified to do so, any libraries/packages/JARs used which are not mentioned by us will lead to negative points.
6. Last but not the least for any doubt regarding problem statements contact coordinators as we are always here to help.

TIME KEEPER

Arsh has a lot of responsibility on his shoulders. He has to take care of a lot of Cyberquest events like Tuxwars, Code Warriors, Softablitz and Revengg. It is becoming very difficult for him to manage his time. He loses track of time and misses his academic classes due to which he faces the fury of professors. Apart from all these he also loves to play video games a lot. But due to a lot of pending work he wants to distribute time for all his work. He is in dire need of a timekeeper and needs help from you. Create an application having following features and functionality.

Basic Features:

1. Your application must display current date, day and time i.e. basic clock functionality.
2. It should have a stopwatch with start, pause, resume, lap functionalities
3. It should have an alarm functionality i.e time based event triggering.
4. Option to snooze the alarm.
5. It should have a timer where you can set time and it runs backward. On completing it should trigger an alert.
6. Display of calendar of previous, current, next month.

Advanced Features:

1. Add and display clocks for different time zones.
2. Change alarm sound for different alarms. Select soundtrack at the time of setting the alarm.
3. Change timer sound for different timers. Select soundtrack at the time of setting the timer.
4. Setting and displaying of alarm messages.
5. Save the state of your alarm/timer and get the state as soon as we restart the application i.e. the alarm/timer set must retain even if the application is stopped.

SHARE NOW

Suraj is our saviour when it comes to completing and submitting timed assignments in every lab. He does every assignment with great zeal and dedication and then sends us through mail. But one day a lab assistant caught him sending the assignment and he sadly was expelled out of the lab. To add to our sorrow, they blocked all the known file sharing resources in lab computers. Now we need a new software which can help us transfer files among the lab computers. Suraj and his friends now rely on you people to create an application with following features

Basic Features:

User Features:

1. A user should be able to register login and logout to the server.
2. Every user should be able to upload and download files.
3. File uploaded must be transferred to the server along with all the relevant details like owner, name, size, type.

4. Uploader should be able to tell how many times the given file can be downloaded. After that file is downloaded the mentioned number of times it should be deleted from the server.
5. Every uploaded file must have a code generated which will be shared.
6. Every user should be able to download files from the server with the code given to him.

Admin Features:
1. Separate login for Admin.
2. Admin should be able to see how many files have been shared by all the users along with all file info and number of downloads left.
3. Admin should be able to remove any file on ground of violation of code of conduct.

Advanced Features:

1. Uploader can set the time for which the file should be available for download, after that time passes the file should be deleted from the server
2. Uploader can revoke a file using its identifier. If he does so then that file identifier can't be used to download a file anymore or file gets deleted from the server
3. There can be multiple storage servers to store files with a proper load balancing based on some parameter.
4. File can be stored to multiple servers so that if a storage server goes down the user is still able to download the file.

FOOD PILE

Abs are temporary, food is forever. Shashwat is a big foodie and ideal guy for all sorts of food recommendations. Due to ongoing placements he bought a lot of food items.Being recently placed, he is now ready to share his foods with his batchmates and needs to manage huge piles of food he has collected, for that he needs a java application.Help him build the application and if lucky enough he might share his food treasures with you.

Basic Features:

1. A user should be able to sign up, sign in and sign out in your application.
2. Users can add items to the inventory.
3. Users can update the item details.
4. Users can remove items from the inventory.
5. A user can search based on :
    a. Product Name
    b. Product Category
6. A user can sort and display the inventory based on:

a. Price of an item.
b. Quantity of item.

Advanced Features:

1. Analysis of inventory through graphs and bar charts.
2. Alerts will be shown if a particular item goes below its threshold quantity.
3. Multilevel filters e.g. filtering fridges from electronics, then filtering based on capacity of fridges

ADVENTURE AWAITS

"It's 30th October 2020, today the world was awestruck with the release of the world's most amazing MMORPG 'Adventure Awaits' developed by a team of MNNIT in their most amazing development event SOFTABLITZ." was what a mail Prajjawal received from an unknown sender(of course). Prajjawal having watched Dark knew everything had to happen how it had happened. So in order to maintain the space-time continuum he added this problem statement. Which of you teams has the strength to be the team mentioned in the prophecy for whom untold honour and riches await.

Basic features : A single player RPG with turn based battles

1. A world map (2-D Green Patch, land-marks, start point, safe zones, shops, inns)
2. Player Classes (Wizard, Warriors, Merchant, Joker ...)
3. Leagues, badges, experience, levels
4. Safe zone like towns (you can't be attacked here)
5. Battle System (A point based battle system, defence turn based battles or anything else like mini game based battle)
6. Monster System (Random NPC monsters with health attack, defense and spells)
7. NPC System (some storyline or just normal words)

Advanced Features: An online MMORPG

1. Procedural world generation system (Create infinite worlds, levels, maps)
2. Shops system (Items, weapons, currency, purchases, armour)
3. Clan System (something like COC just for chat and scheduled clan battles and items sharing)
4. Battle System Advanced (More choices in battle like spells, heal, items)
5. Ability to add friends
6. Chatting system (global chat, friends chat)
7. Challenge other players (ex type in command pallet challenge username and if he is in a certain range on map then challenge will begin.)
8. Special spell cards like (Steal (), goto () , ...)
9. Give a motive to the game like defeat the boss on each zone and proceed to next or collect specific items or kill random spawning bosses, make it interesting.
10. Tournaments system (Optional Feature) (Admin can organise special tournaments in specific towns for specially invited players at specific times)

Notes:

1. You are free to use your imagination and add more features. Make it innovative, add luck and skill based stuff such that the lower rated does not always lose.
2. Reference videos:
3. https://drive.google.com/drive/folders/1-e4RSz1A8xuz7Ank-s4YZ5iAcJbTVi-_?usp=sharing

LOCKDOWN TRAVELLER

Avishkar in Covid seemed an impossible task with an online semester, ongoing placements and never ending lockdown. Anuj being the leader he is started managing it all, be it scheduling classes or planning events he is all over the place. As Avishkar approaches he is getting more and more desperate to bring in new sponsors for all events. Not so friendly sponsors need to meet him in person. Being really scared of flights, trains are his only hope. Being overwhelmed with responsibility he needs your help to plan his journeys and book his travels.

Basic features :

User:
1. Should be able to sign up, login and logout.
2. Can see trains between source and destination.
3. Can see availability of seats(in different classes like AC,sleeper..)
4. Can give Berth preference(upper/lower/middle/side upper/side lower) and other passenger details and request to book tickets.
5. Can cancel their bookings.

6. Can see cancelled and rerouted trains.
7. Can see his booking history and upcoming travels.
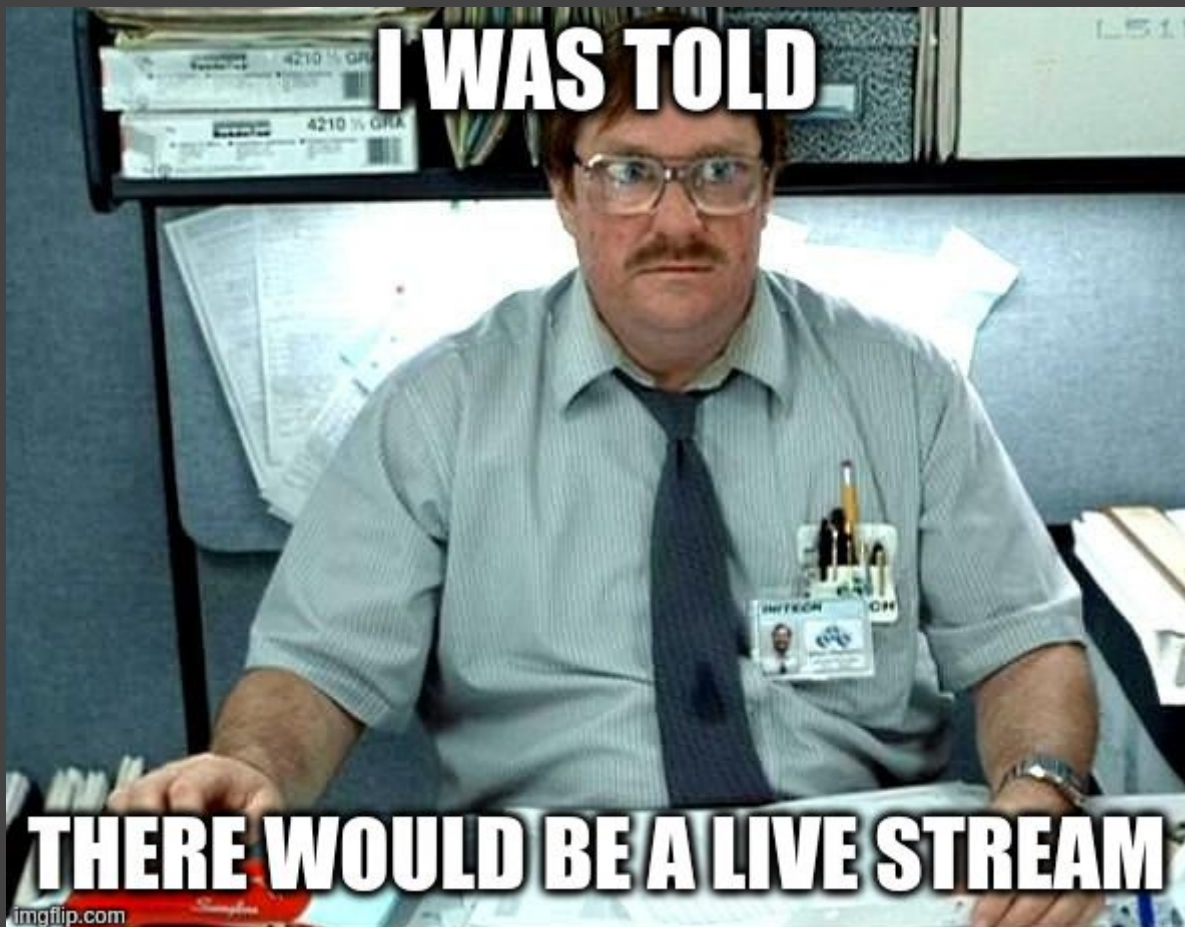
Admin:

8. Maintain customer information.
9. Maintain trains information(source, destination, time, stops etc).
10. Book seats and send tickets to users.
11. Maintain current seats in trains.
12. Add and remove trains.
13. Add and remove seats/Coaches in trains.
14. Cancel trains.

Advanced features :

1. Admin can give discounts to frequent travellers e.g. give a discount to travellers who booked tickets worth X rupees in a given month will receive a discount for the next month.
2. Notify users of their upcoming journey a couple of hours before the scheduled time.
3. Dynamic Pricing on some Special trains.
4. Cancel and reroute trains for a certain duration.
5. Display the probable halting Platform No. of the trains at stations/junctions.
6. Create tourist packages.
7. Book meals during a journey.
8. Tatkal, special and senior citizen quota for tickets.
9. Female travellers are allotted seats nearby if they are travelling alone.
10. Users get notification for offers and train cancellations or reroutes.
11. Have a chat feature to handle complaints from users.
12. Analysis of traffic on routes and trains using graphs and charts.

REVENGE LIVE

Twitch is a video live streaming service with a plethora of features. But this giant platform has some major flaws such as controversial moderation, low quality of support to streamers by platform, toxic community thus Mixer (by Microsoft) came to destroy Twitch but after struggling in getting viewership Twitch crushes the Mixer. Since Shrey believed in Mixer and is a good friend of Anuj but this defeat created a fire in him. Now it's your time to prove yourself worthy and help Shrey to destroy Twitch :)

Basic Features:

User:
1. Can sign up and Login / Logout.
2. Has a profile page (Profile image, name, bio..).
3. Set status (Online/Offline).
4. Can search channels.

5. Can watch a channel.
6. Can chat with the community (like conversation side to live stream).

Streamer:
1. User can create/modify their channel (one per user)
2. Can start/stop stream
3. Can stream from desktop/camera with audio(microphone).
4. Is able to see separate chats (All users/ Subscribers only)

Platform Home Page

Advance Features:

User:
1. Can see last seen of other users.
2. Can browse channels based on categories
3. Can follow/subscribe a channel
4. Can mute/pause the stream (client side)
5. Get notified when followed channel starts streaming
6. Can do direct messaging other users

Streamer:
1. Can schedule their live streams (Visible to everyone)
2. Can mute/unmute himself
3. Can streams either for All users or for subscribers only.
4. Is able to choose a streaming source (desktop/camera/both).
5. Sync audio (from mic) with stream
6. When the stream ends can redirect viewers to other live channels.
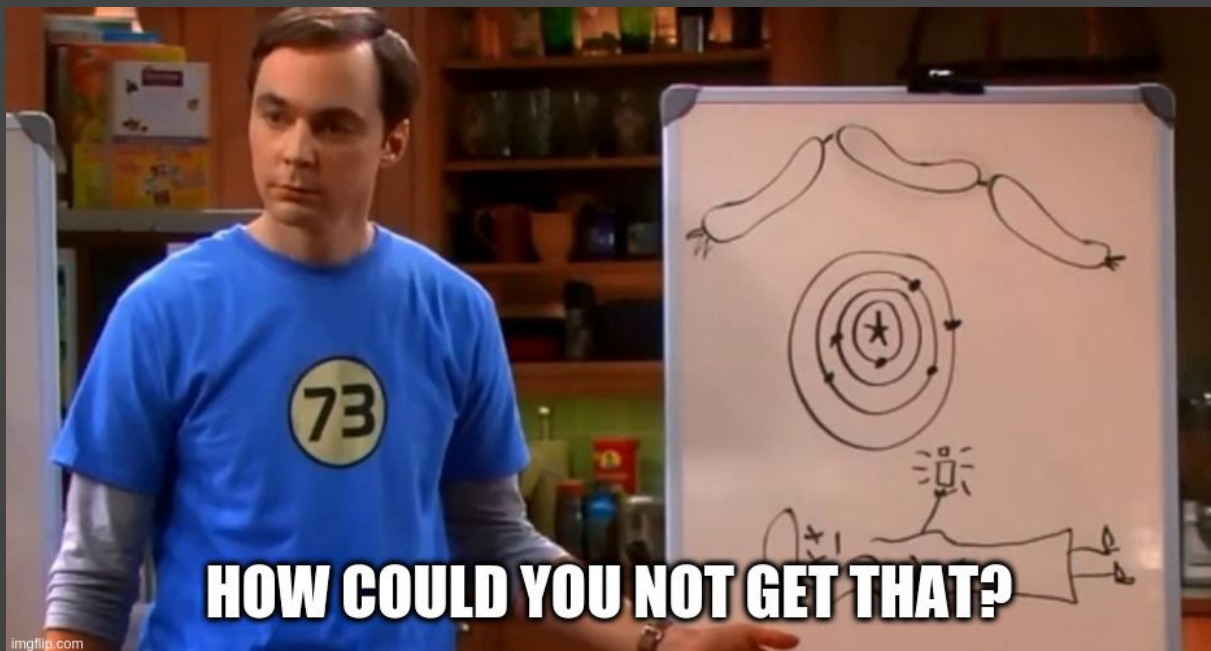7. Get recommendations of channels based on the followed channels

Note: Subscribing a channel costs money so you can create a dummy payment system.
For this problem statement you can use following libraries
1. OpenCV
2. Webcam Capture API (https://github.com/sarxos/webcam-capture)
3. Xuggler

SCRIBBLE WARS

Creating these problem statements hasn't been an easy task, there were constant battles among the group about different things like Allow one problem statement or another? The level of problems to be kept? Which problems to keep in which category? Swing or Fx? and many more. Most of the time was wasted in these discussions. Sahaj decided on a plan as we all know how much he loves scribbling, he decided to organise scribble battles among the opposing groups. The aim was not to take the opinion of the winner but to express your opinion in an intriguing way so that a conclusion can be reached. Help Sahaj create a scribble battle so that he can find out if his plan works.

Basic Features:. create an offline single screen version

1. Basic gameplay routine.
2. Basic paint canvas and drawing with pencil and eraser.
3. Change the size of the pen and eraser.
4. Different colors for the pen.
5. Text Area to type in (Don't cheat :)).
6. A cheat button which the opponent team can press if they suspect cheating.
7. Points based system for the match.
8. Initial splash screen animation.

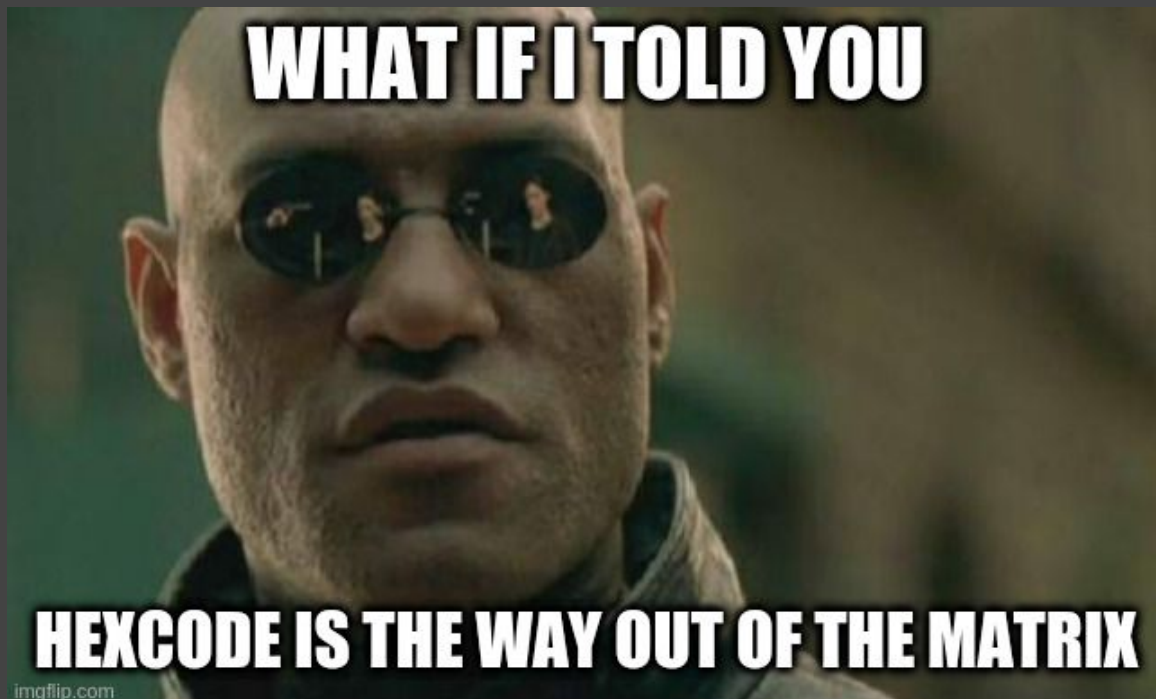**Advanced Features:** Create a complete online multiplayer version

1. Plug and Play (keep everything non-persistent)
2. Game Room creation (like Mini Militia).
3. Team Battle.
4. Offline Practice modes (Impress us by how you will let users practice).
5. LAN multiplayer mode (like Mini Militia) (without internet or external server).

Note:

1. Reference: skribble.io

NEO EDITOR

Shrey, as you all must have seen in the Softablitz Classes, has the habit of NOT believing anyone easily. He even goes to the root of the files you are sharing with him to find out what's hidden. His "Revengg" mindset leads him to hide real information behind the files. Help him be the Sherlock by developing a Hex Editor for him . This will also help him to exchange messages with his beloved ensuring top level of privacy. Guys! Don't disappoint him. He will definitely give you "shrey" for developing it.

Basic Features:

1. You need to create an editor with two sections, where the left section displays the hex code of the file and the right section displays the actual content, both editable.
2. Changes in one section should be reflected in the other section.
3. Identify File Type using Headers of Hex Code . (e.g. CA FE BA BE identifies Java Class File)
4. Editor should have support for editing files of common formats e.g. JPEG, C ,Java, txt etc.
5. Users should be able to open multiple files in different tabs.
6. HEX code should be byte separated.

7. Basic editing features such as cut,copy,paste,delete along with multi-level UNDO and REDO.
8. A files tab with support of OS 's file system like Open Recent Files,New File ,Open etc.

Advanced Features:

1. Users should be able to save files in formats such as pdf, c, java, txt,etc.
2. Support for keyboard shortcut key bindings for common operations such as ctrl+c,etc
3. Find and Replace feature with single instance and all instances support. (Use Trie DS)
4. A window where a user can perform hex operations such as byte flip, block shift, <<, >>, ~, |, &, +, -, *, /, %, Hex-Decimal interconversion. Operations can be applied to a selection and replace the operands with the result.
5. Checksums in your opened file. for e.g "save changes?" pop up.
6. Add "Hex Edit" to Windows Right-Click Context Menu to view and edit files.

TRACK-A-COV

Manas and Nitish are good friends but they tend to disagree over pity things. After being disappointed by no media coverage, Manas tried to convince Nitish about the worsening COVID situation. But, yet again Nitish disagrees with all statistics Manas brings. Help Manas in making Nitish realise the state of pandemic by building an application to show his friend all the statistics of the pandemic and stay safe..

Basic Features:

1. Display COVID-19 stats (state-wise, district-wise).
2. Feature to search stats for individual state, district.
3. Display total cases, active cases, recovered cases, etc.
4. Symptom analyser (set of questions like Arogya Setu to determine if you might be covid positive), calculate a percentage.
5. Add a refresh option to fetch latest stats.
6. Fetch COVID related news.
7. Link to covid related websites which would open in the web browser (like WHO, Govt. of India, etc.).
8. Covid advisories, helpline and contact numbers (Hint: available in one of the APIs mentioned below).

Advanced Features:

1. Plot stats using graphs (use your creativity).
2. Make stats available offline (use a database) and maintain time-stamp to indicate when the data was last fetched.
3. A user should be able to bookmark their favourite news articles locally and view them later.
4. Calendar-like feature to view stats for each day.

Note:
- You are free to use any API. Here are some for you to explore :
    a) https://github.com/amodm/api-covid19-in
    b) https://github.com/zpelechova/covid-in
    c) https://documenter.getpostman.com/view/10808728/SzS8rjbc
    d) https://rapidapi.com/contextualwebsearch/api/web-search/endpoints
- Use GSON library for handling JSON response

AMPIFY

Placements this year have been a strenuous task. Kashyap, Chitranshu and Anshul took the responsibility of getting the entire batch placed. The work in TPO and a broken music system has made their life too stressful. Now it's your responsibility to keep them entertained with a music player while they keep doing their work.

Basic Features:

1. A user can login / register.
2. New users choose the languages, artists and genres they like.
3. Basic media player features like play, pause, play next, repeat, shuffle, seekbar, adjust volume, length of the song in front of each song.etc.
4. A user can see his most played and recently played songs.
5. A user can create custom playlists.

6. History of songs played.
7. Editable queue to play songs.
8. Like / dislike a song.
9. Show new songs added to the server.
10. Download a song for playing offline.
11. Filters for searching songs (like album, artist, etc.).
12. Display lyrics of songs.
13. Search for users and create a group.
14. Have group playlists where each member can add their music.

Advanced Features:

1. Equalizer.
2. Play videos.
3. Display all local music and play them.
4. Sync lyrics display with music playback.
5. Recommend a user new music based on his likes and basic feature #2.
6. Recommend a user songs based on his previously played music at the similar time of the day.
7. Display trending songs and rankings based on user play count.
8. Create a shareable playlist and share it with other users.
9. Play the group playlist synced across all devices.
10. Downloaded music should not be accessible by local file system.
11. Allow all the functionalities while music plays in the application.

Note:
1. Music files with relevant metadata and lyrics files will be provided on request if attempting this problem statement.
2. References:
   a. Spotify
   b. AmpMe