Social Brain

Description

Social Brain is an application that is ethically approved by the ethics committee of King's College London This application has been created by a PhD student to get the data needed for her research which examines the impact of social media platforms on mental health. For more information and previously asked questions you can visit **http://3.19.33.131:3000/web/questions**

Installation

You can simply download this app from play store using this link
http://3.19.33.131:3000/web/

Permissions

For efficient working of this app, app need permissions like local storageand enable notifications

Terms and Conditions

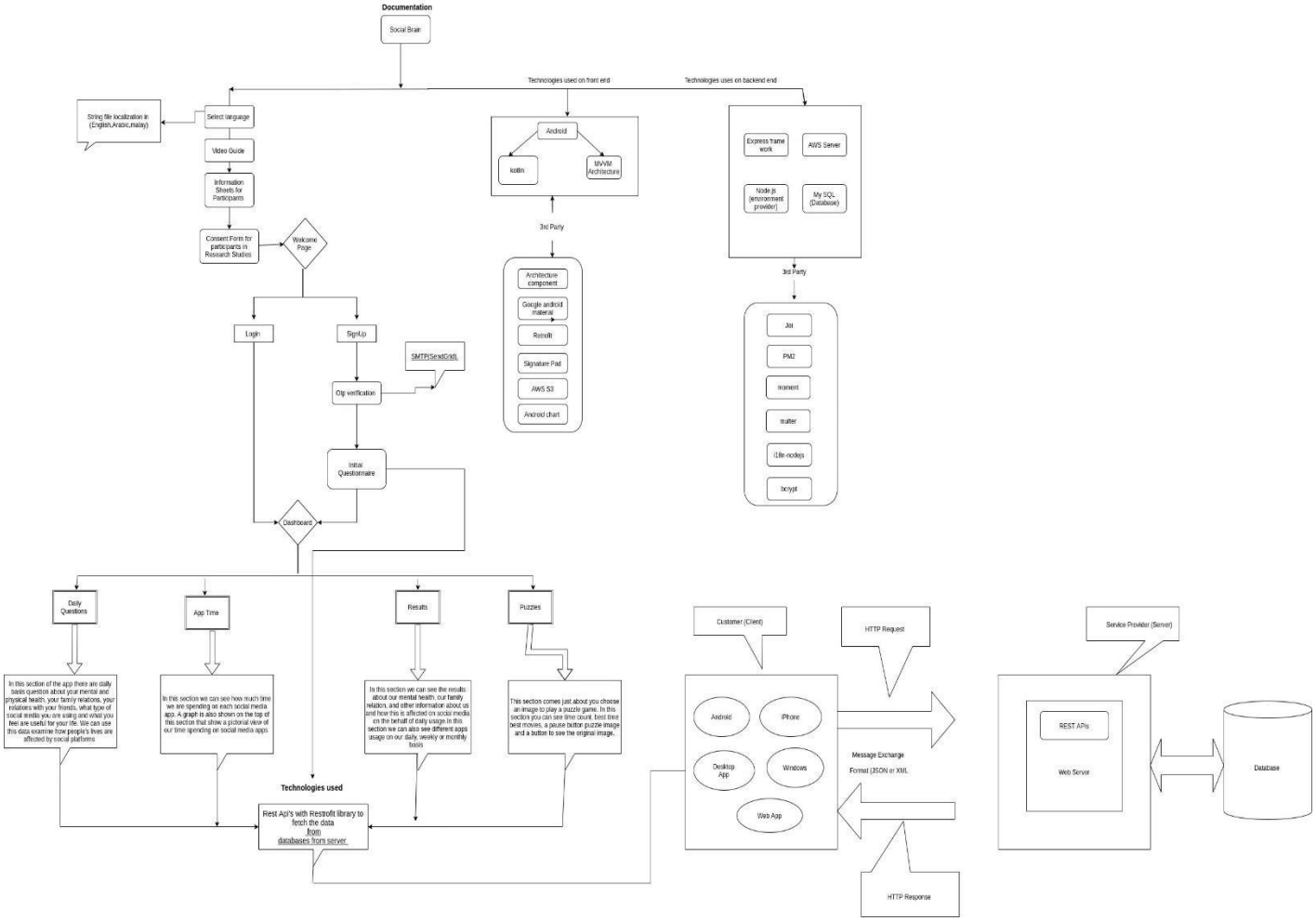
King's College London is responsible for protecting the data you provide when you use the **Social Brain** application. King's College has adopted this privacy policy to ensure that the data collected from you via **Social Brain** application is protected.

License

Contact

Email : socialbrainapplication@gmail.com

Application work flow



Front end

Android:

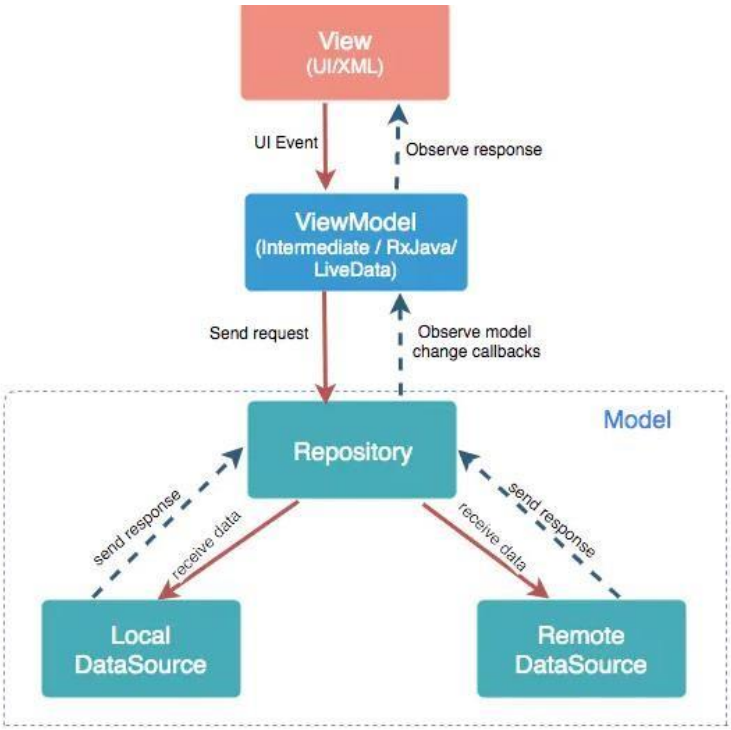
Android is a component-based platform that has a different programming model than many other platforms. Understanding this component model, especially the familiar UI components known as Activities, is essential to success. In this course, Understanding Android Application Basics, you'll get a better understanding of the Android application basics. First, you'll start by deploying a simple Android application to become familiar with the environment. Next, you'll walk through the process of designing the user experience for a more involved application. Finally, using the Android Studio designer, you'll layout an interactive activity and connect it to Java code. Throughout the course you'll continue enhancing the app to become a multi-activity user experience that provides interactive editing features and proper Activity lifecycle management.

Kotlin:

Kotlin is a cross-platform, statically typed, general-purpose programming language with type inference. Kotlin is designed to interoperate fully with Java, and the JVM version of Kotlin's standard library depends on the Java Class Library, but type inference allows its syntax to be more concise.

MVVM:

MVVM architecture is a Model-View-ViewModel architecture that removes the tight coupling between each component. Most importantly, in this architecture, the children don't have the direct reference to the parent, they only have the reference by observables.



-Model: It represents the data and the business logic of the Android Application. It consists of the business logic - local and remote data source, model classes, and repository.

-View: It consists of the UI Code (Activity, Fragment), XML. It sends the user action to the View Model but does not get the response back directly. To get the response, it has to subscribe to the observables which View Model exposes to it.

-View Model: It is a bridge between the View and Model (business logic). It does not have any clue which View has to use it as it does not have a direct reference to the View. So basically, the ViewModel should not be aware of the view who is interacting with. It interacts with the Model and exposes the observable that can be observed by the View.

3rd party

Android Architecture:

Android architecture contains different number of components to support any android device needs. Android software contains an open-source Linux Kernel having collection of number of C/C++ libraries which are exposed through an application framework services.

Among all the components Linux Kernel provides main functionality of operating system functions to smartphones and Dalvik Virtual Machine (DVM) provide platform for running an android application.

The main components of android architecture are following:-

- Applications
- Application Framework
- Android Runtime
- Platform Libraries
- Linux Kernel

Material Design for Android:

Material design is a comprehensive guide for visual, motion, and interaction design across platforms and devices. To use material design in your Android apps, follow the guidelines defined in the material design specification and use the new components and styles available in the material design support library. This page provides an overview of the patterns and APIs used.

Android provides the following features to help you build material design apps:

- A material design app theme to style all your UI widgets
- Widgets for complex views such as lists and cards
- New APIs for custom shadows and animations

Retrofit:

Developed by square and in documentation, it is type-safe REST client for Android and Java. Retrofit turns your HTTP API into a Java interface. Retrofit android is very simple to use. It essentially lets us treat API calls as simple Java method calls, so we only define which URLs to hit and the types of the request/response parameters as Java classes. The

entire network call + JSON/XML parsing is completely handled by Retrofit (e.g. Gson for JSON parsing). It allows to make a synchronous or asynchronous HTTP request to the remote webserver.

Singnature pad:

Android Signature Pad is an Android library for drawing smooth Signatures post by Square. Features Bézier implementation for a smoother line Variable point size based on velocity Customizable pen color and size Bitmap and SVG.

Amazon S3:

Amazon Simple Storage Service (Amazon S3) is an object storage service that offers industry-leading scalability, data availability, security, and performance. Customers of all sizes and industries can use Amazon S3 to store and protect any amount of data for a range of use cases, such as data lakes, websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics. Amazon S3 provides management features so that you can optimize, organize, and configure access to your data to meet your specific business, organizational, and compliance requirements.

Android chart:

AnyChart Android Chart is an amazing data visualization library for easily creating interactive charts in Android apps. It runs on API 19+ (Android 4.4) and features dozens of built-in chart types. **https://github.com/AnyChart/AnyChart-Android**

Backend

Express Frame and Node.Js:

The express framework is the most common framework used for developing **Node js** applications. The express framework is built on top of the node.js framework and helps in fast-tracking development of server-based applications. Routes are used to divert users to different parts of the web applications based on the request made.

My SQL:

MySQL is an Open Source relational database Management System. MySQL operates on almost every platform UNIX, Linux, and Windows. Although MySQL is used for a large number of applications, it is most frequently associated with web applications and online publications. MySQL is an important component of the LAMP open-source stack. LAMP is a development platform for Linux, Apache, and the web server as the operating system.

3rd party tools

Joi: Joi is a validation library that allows you to build schemas to validate JavaScript objects. Basically Joi provides methods to easily validate strings, booleans, integers, email addresses, phone numbers, among others.

PM2:PM2 is an acronym of Process Management Module which is used to run and manage Node.js applications. Its an open source with an in-built Load balancer

- Restarting after crashes: PM2 allows us to keep processes running until server failure.
- Monitoring and managing processes remotely: A magic-powered web portal allows you to keep an eye on remote processes and manage them.
- It doesn't just run Node apps: PM2 isn't limited to just Node.js processes, that's right, you can even use it to keep your Minecraft server online.
- Restart-Persistance: PM2 can remember all your processes and restart them after a system restart.

Moment: Moment.js is a date library for JavaScript that parses, validates, manipulates, and formats dates. In this article, we are going to see how we can use moment.js in node.js. Before using moment.js, we must ensure that we have installed the library. We can do so by using the following command.

Multer: Multer is a node.js middleware for handling multipart/form-data, which is primarily used for uploading files. It is written on top of busboy for maximum efficiency. It adds a body object and a file or files object to the request object. The body object contains the values of the text files of the form, the file or files object contains the files uploaded via the form.

Node.js and Bcrypt: Bcrypt is a simple hashing library for Node.js. Bcrypt is a simple way for authentication in Node.js which encrypts your password. So, if you want to implement only the username and password authentication method, it is a wise decision to go with Bcrypt.

Sign up verification process

We have use SMTP (Send Grid) for OTP verification through email.
SendGrid is a cloud-based platform that solves the challenge of email delivery. SendGrid provides and manages an email server on your company's behalf, so your communications with customers are reliably sent and delivered as needed. SendGrid provides a cloud-based service that assists businesses with email delivery. The service manages various types of email including shipping notifications, friend requests, sign-up confirmations, and email newsletters. It also handles Internet service provider (ISP) monitoring, domain keys, sender policy framework (SPF), and feedback loops.

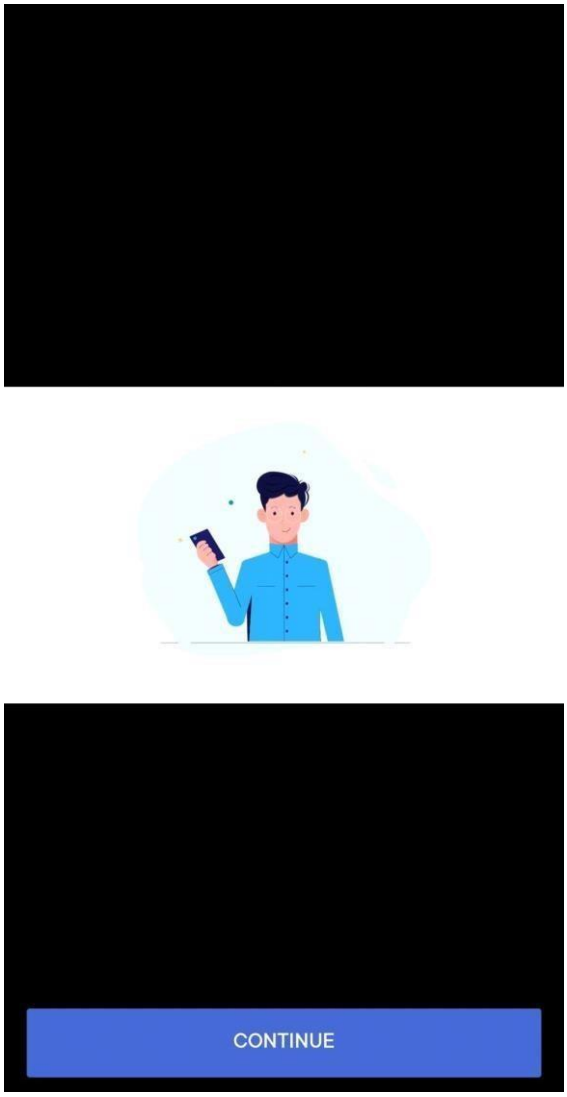
Localisation for (Arabic/English/Malay)

In android, Localization is a process to change the string into multiple languages based on our requirements. While implementing localization in our android app, we need to handle text, audio files, numbers, currency and graphics in a way that is appropriate for the locales where our application is used. Generally, android consider English is a default language and it loads the string resources from **/res/values/strings.xml**. In case, if we want to add a support for other languages, we need to create a values folder by appending the Hyphen and ISO language code. For example, if we want to add support for **Japanese**, then we need to create a **values** folder named **values-ja** under the **res** folder and add a **strings.xml** file in it with all the strings that need to translate into the **Japanese** Language.

There is a brief guidance to use the Social Brain app and it’s features

Select Language

First of all when you open this app this page appears. In this page you can choose the language you prefer to use the app.



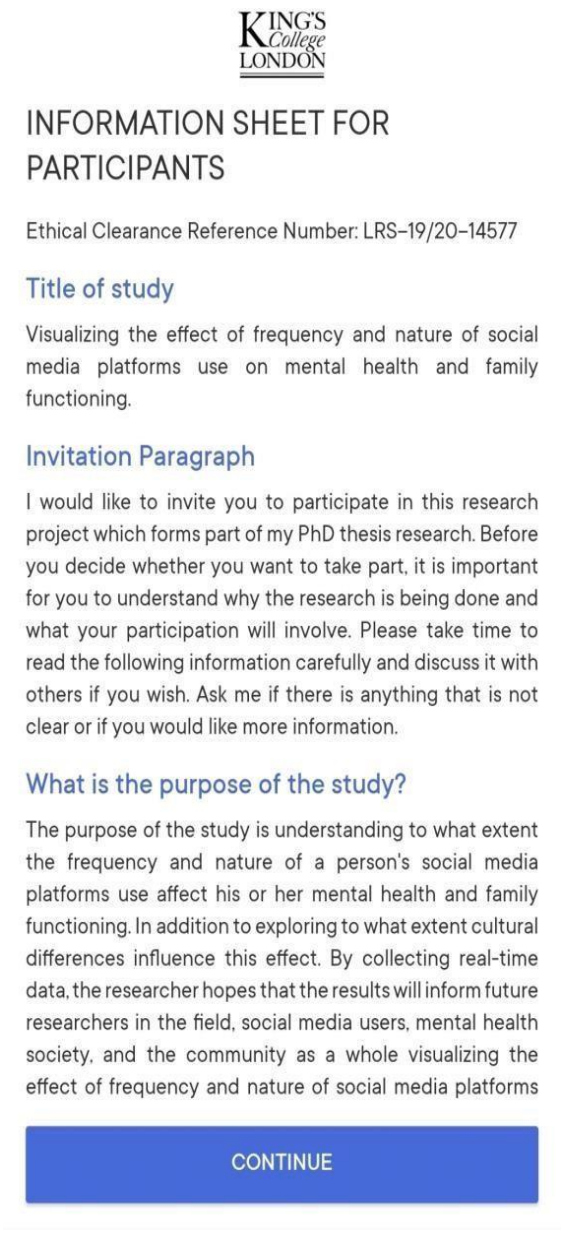
Video Guide

This video is a basic guidance for the purpose of this app and the data collected from the user.

Information Sheet for Participants

In this section you can see the detailed information about this app. Scroll down to read what the information sheet of the app includes:

Title of study
Invitation Paragraph
What is the purpose of the study?
Why have you been invited to take part?
What will happen if you take part?
Do you have to take part?
Incentives
Data handling and confidentiality
Data Protection Statement
What if you change your mind about taking part?
What will happen to the results of the study?
Who should you contact for further information?
What if you have further questions, or if something goes wrong?



KING'S College LONDON

INFORMATION SHEET FOR PARTICIPANTS

Ethical Clearance Reference Number: LRS-19/20-14577

Title of study

Visualizing the effect of frequency and nature of social media platforms use on mental health and family functioning.

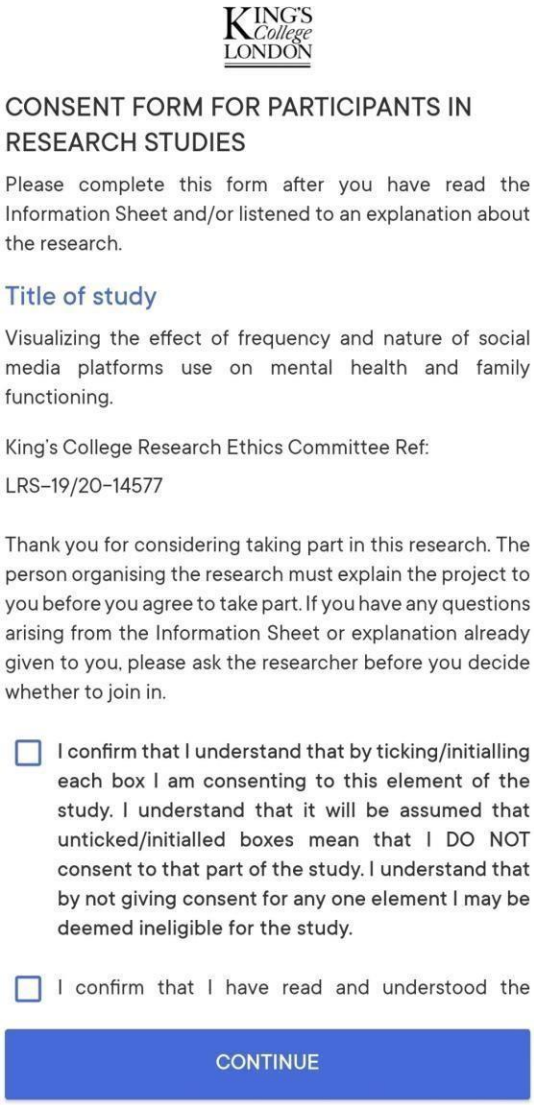
Invitation Paragraph

I would like to invite you to participate in this research project which forms part of my PhD thesis research. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The purpose of the study is understanding to what extent the frequency and nature of a person's social media platforms use affect his or her mental health and family functioning. In addition to exploring to what extent cultural differences influence this effect. By collecting real-time data, the researcher hopes that the results will inform future researchers in the field, social media users, mental health society, and the community as a whole visualizing the effect of frequency and nature of social media platforms

CONTINUE



CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of study

Visualizing the effect of frequency and nature of social media platforms use on mental health and family functioning.

King's College Research Ethics Committee Ref:

LRS-19/20-14577

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in.

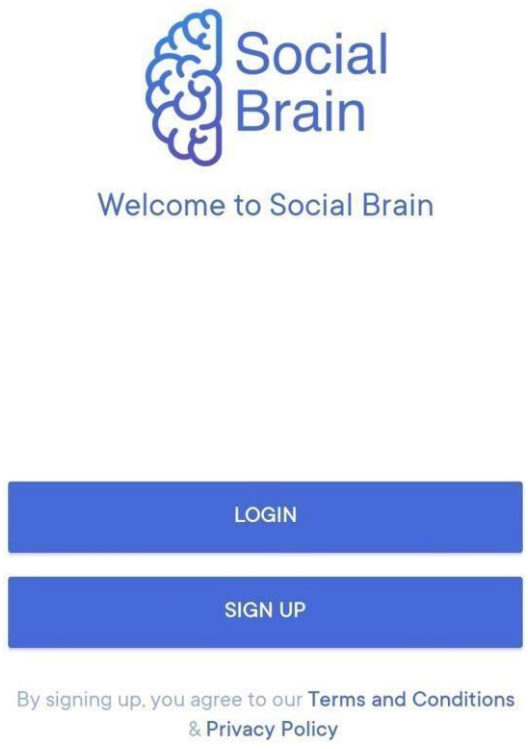
I confirm that I understand that by ticking/initialling each box I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes mean that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element I may be deemed ineligible for the study.

I confirm that I have read and understood the

CONTINUE

Consent Form for Participants in Research Studies

This Consent form is confirmation of the user that he/she agrees with terms and conditions of this study. In this section participant also need to submit their name and draw their signature.



Login and Signup Page

This page contains two type of actions

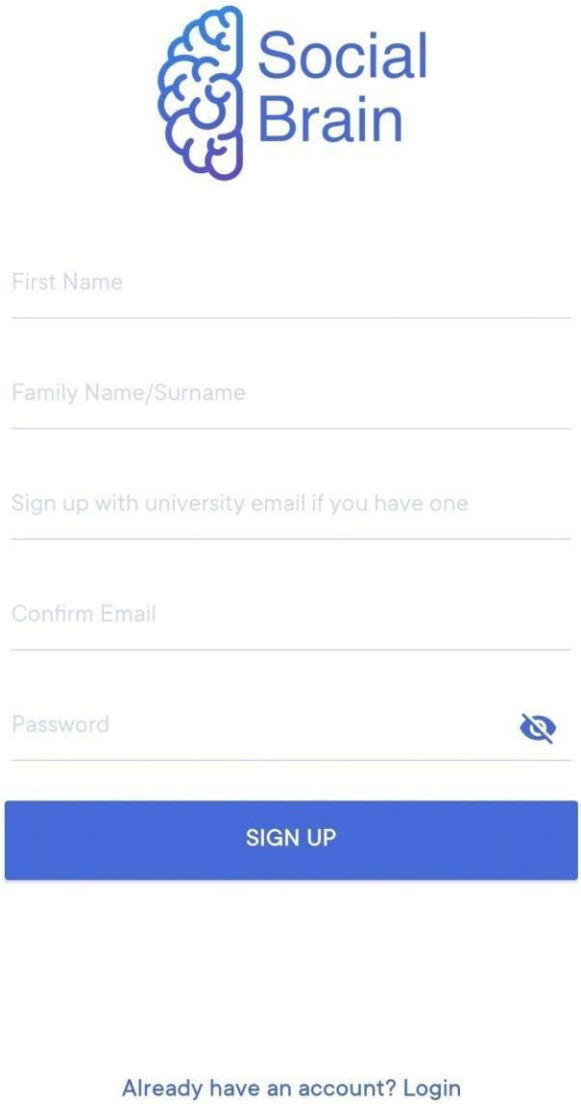
Login

If you are the existing participant with this app than you can with Login.

SignUp

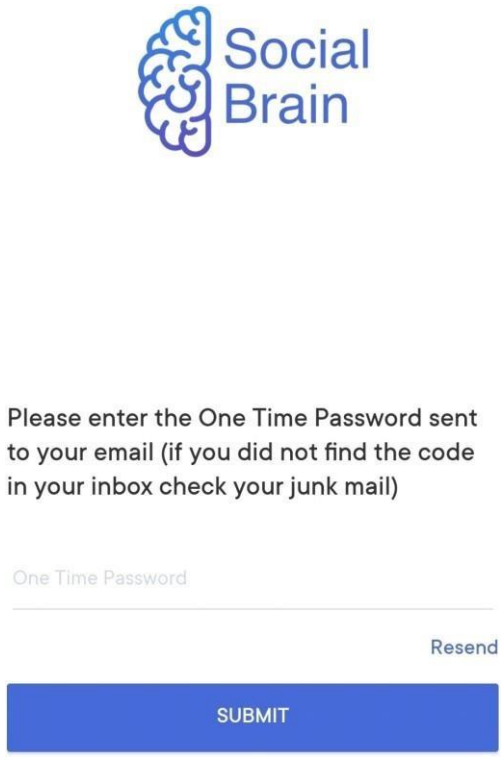
If you are new participant with this app than you can go with Signup.

Note: You can also see the Terms and Conditions & Privacy Policy



Signup Page

If you are new participant then you can sign up with some basic information like Name, Surname, Email and password



OTP Screen

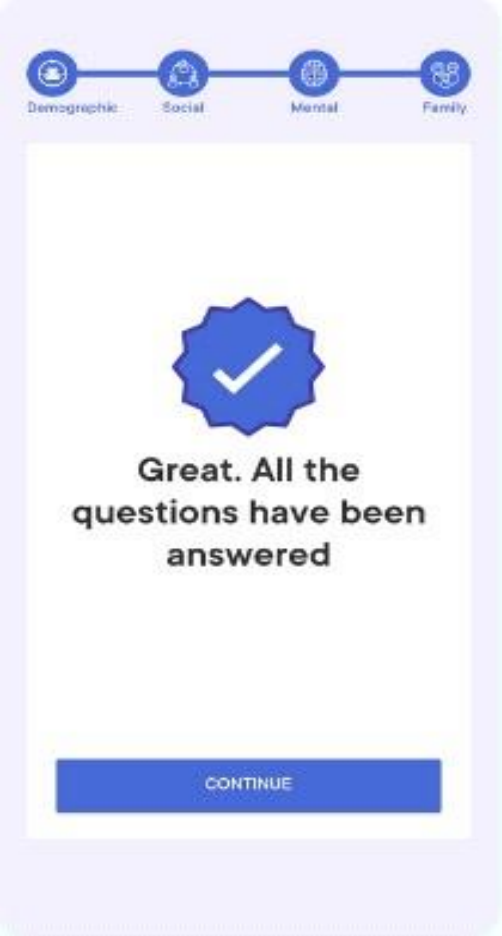
When you register yourself as a new user, OTP one time password sent on your registered mail-ID you can just put your OTP and proceed next. If you didn't get the OTP than you can go with resend.

Technologies used:

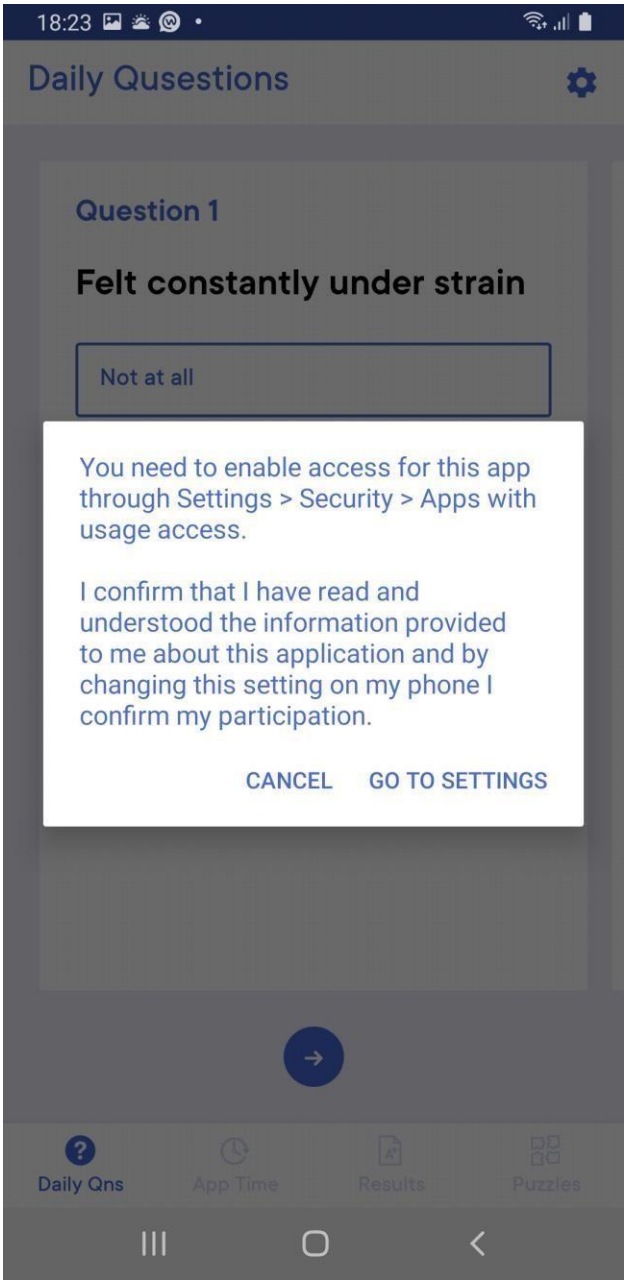
SendGrid have been used for the OTP SendGrid is a cloud-based SMTP provider that allows you to send OTP on user's email

Initial Questionnaire

After the completion of the account verification then you will be asked to complete an initial questionnaire, which takes about 30 minutes. The questionnaire includes demographic, social media, mental health, and family functioning questions. You can take a break after completing each section of the questionnaire. As answers are saved and sent to the server after the completion of each section.



Once you answered with all these questions you are set up participant in the project.



Enable Access

After completion the initial questionnaire you will reach at home section where notification popup will appear asking you to enable access for this app through Settings>Security>Apps with usage access. By changing this setting you are confirming that you have read and understood the information provided to you about this application and by changing this setting on your phone you are confirming your participation.

The Application tabs

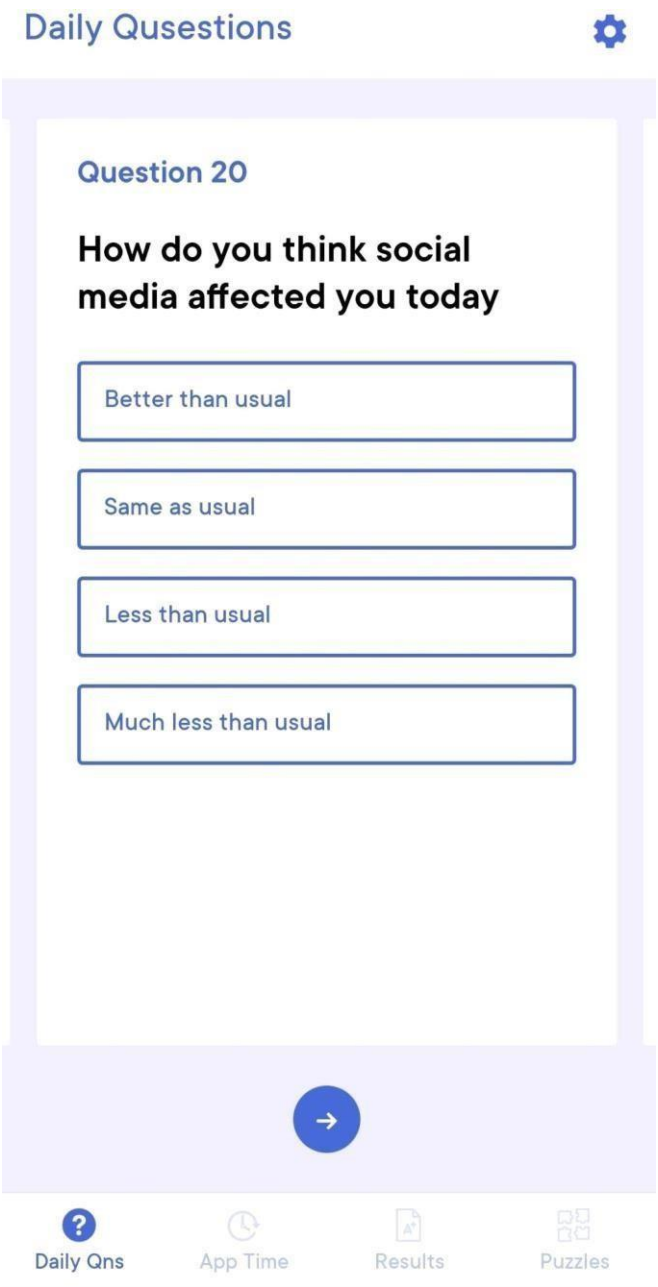
On application we have four tabs:

1: Daily questions

2: App time

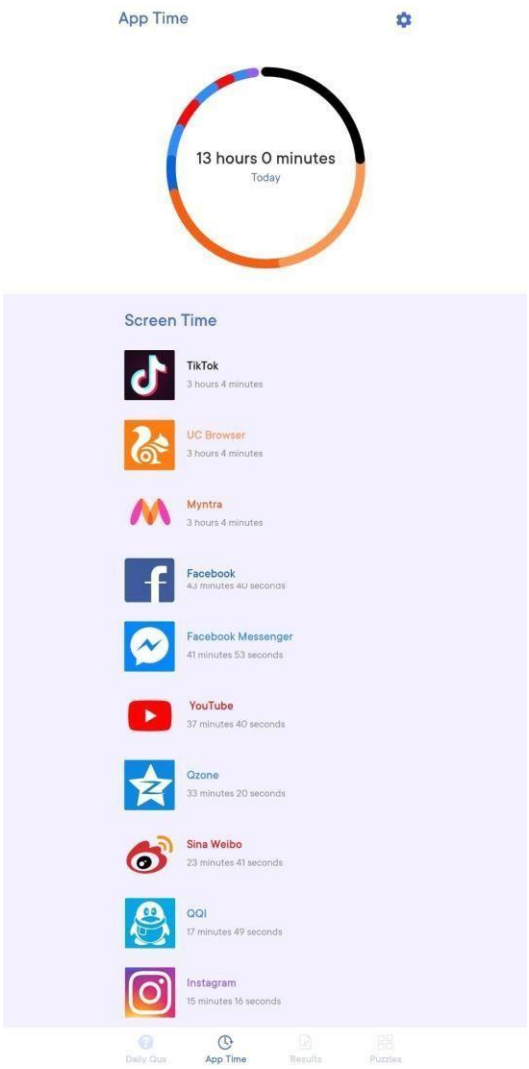
3: Results

4: Puzzles



1: Daily Questions

In this section of the app, there are some daily basis questions about your mental health, your family functioning, and what is the effect you feel social media had on you on this day of the week. You will get 5 questions daily on the bases of each questions you will get a score value that makes the status of your results on the 7th day of the week. In case you did not answer the daily questions you will find them grouped for you for the number of days you did not answer but these grouping will time out when reaches Sunday of every week.



2:App Time

In this section we can see how much time we are spending on each social media app. A graph is also shown on the top of this section that show a pictorial view of our time spending on social media apps

Technologies used

How can we collect app usage data and time range?

We have to call Query Events (long begin_time, long end_time) method as it will provide us all data starting from begin_time to end_time. It give us each app data through foreground and background events instead of total spent time like queryUsageStats() method. So, using foreground and background events time stamp, we can count the number of times an app has been launched and also can find out the usage duration for each app. After collecting the time usage from app we send over it to the server and save on our database and on the bases of whole process the app time has been shown out every 7th day to the participants. This functionality cannot work unless the participant enables the settings as displayed before.

3:Results

In this section we can see the results about our mental health, our family functioning, and how this is affected by social media on the daily usage. In this section we can also see different apps usage on our daily, weekly basis.

In the weekly results, you can explore more about the average of the top 10 most used applications, choose to show only social media out of those applications, and go in the details of each day of the week.

Logical structure

The app results will comes on the bases of daily questions score based upon the average score the result will come with for status.

1 healthy ,2 almost healthy,3 almost unhealthy, 4 unhealthy

- For Mental health scoring**:** Likert Scale 0, 1, 2, 3 from left to right. 12 items, 0 to 3 each item Score range 0 to 36.

Scores vary by study population. Scores about 11-12 typical.

Score >15 evidence of distress

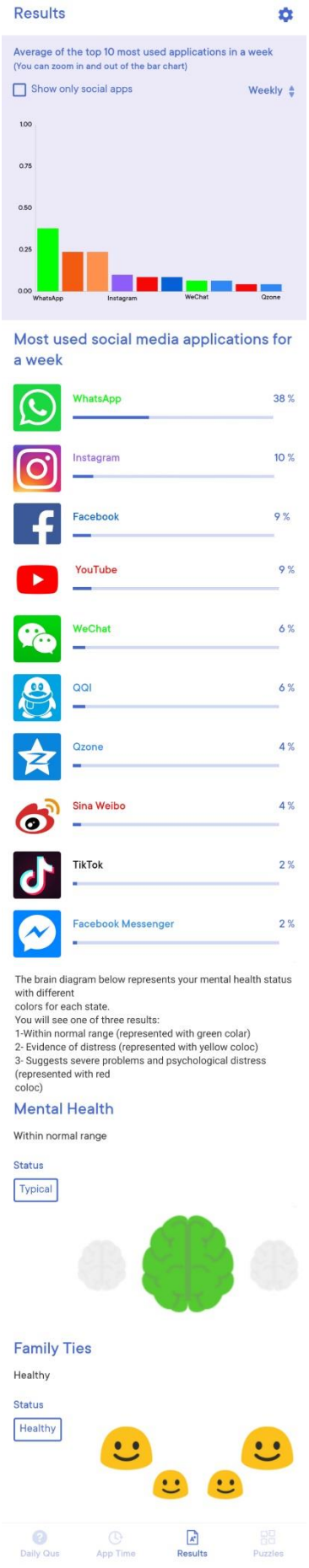
Score >20 suggests severe problems and psychological distress

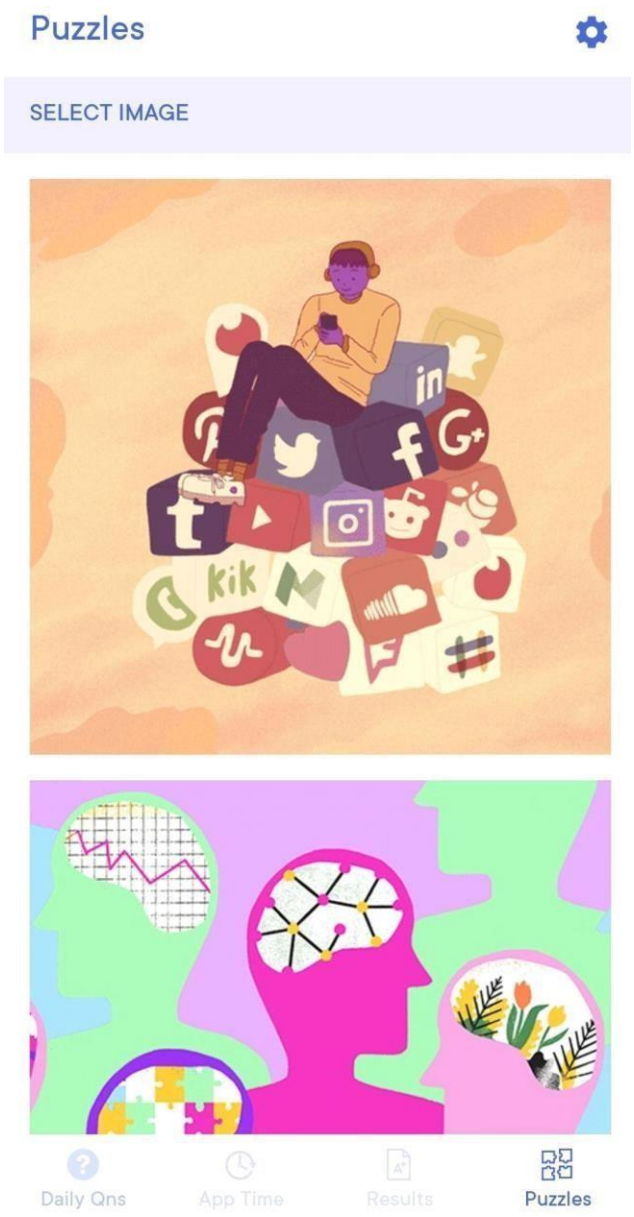
- For Family functioning scoring**:**

FOR family functioning The healthy functioning items SA=1 A=2 D=3 SD=4

The unhealthy functioning items SA=4 A=3 D=2 SD=1

To have the total result will have to calculate the healthy functioning items and the unhealthy functioning items add all numbers divided by 12 (total number of questions)

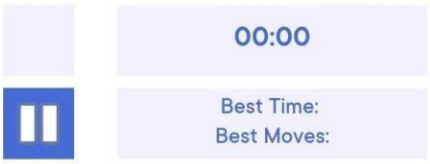




4:Puzzles

This section contains various images. You can choose the play the puzzle or not, no data is collected from this puzzle it was only included to increase the engagement of users with the application.

Playing Puzzle

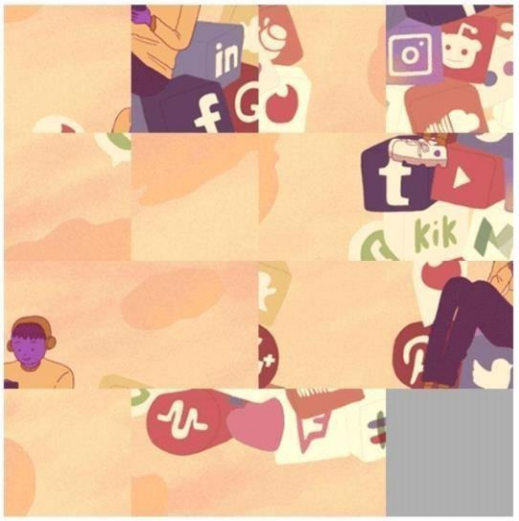


This section comes just after you choose an image to play a puzzle game. In this section you can see time count, best time best moves, a pause button, puzzle image and a button to see the original image.

Technologies uses

Class name:

Puzzle Activity



-Retrieve data from main activity, and create the images for the grid cells using the given image and grid size.

-Create a randomised list of indexes to randomise the image grid, and load the cell images to the grid accordingly.

-The randomised order. Add cell tags for tracking of the images as they are moved by user. Set cell on ClickListener.

-To allow user to click or swipe cells to move the images, and add pause button listener, to open pause UI.

Settings

In this section of the app you can see options like:

Push Notification:

There is an option for the user to unable/disables the notifications which are comes from the server side.

Change password:

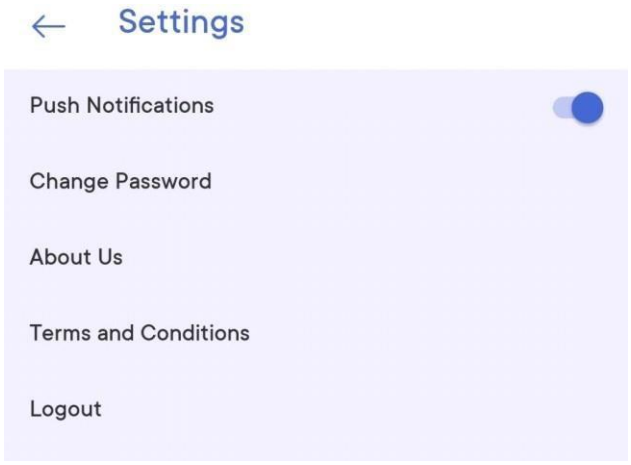
There is an option for user to change the password if you want to make it more secure.

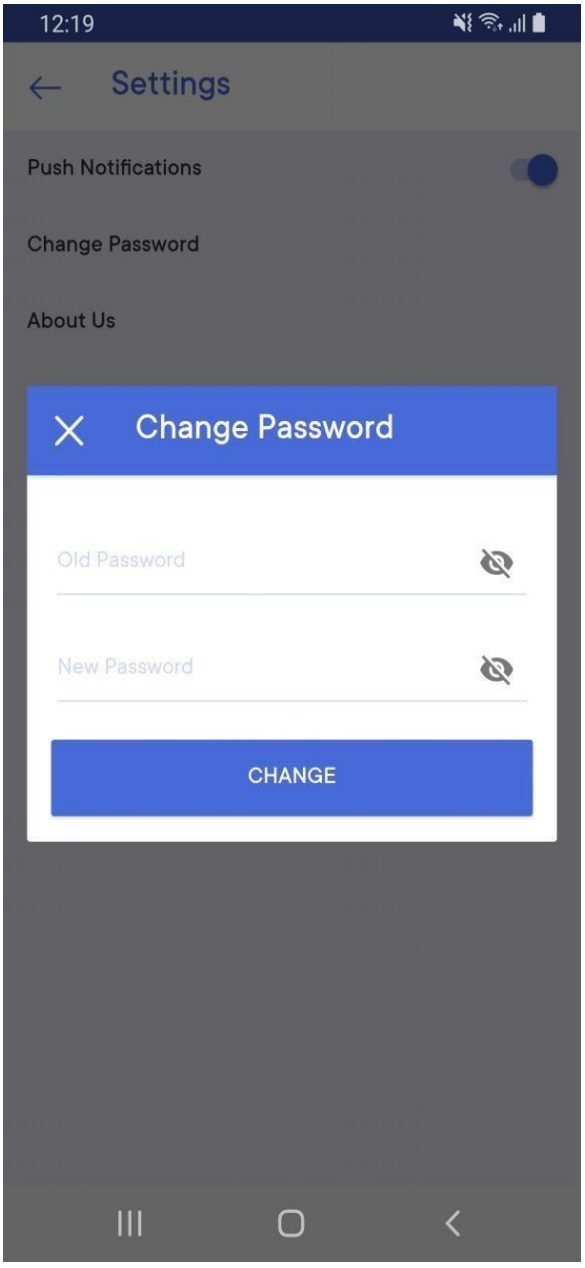
Steps

1:Enter old password

2:Enter new password

3:Continue with **Change**





About Us: There is an option for about us. About Us pages are where you showcase information about the researcher.

Terms & Conditions: There is an option for Look up into the trems & conditions. Terms and Conditions is the document governing the contractual relationship between the provider of a service and its user.

Logout: There is a logout option to pop out from the application and start with another account.

Client Side technologies

Rest Api's have been used to communicate with server to collect the data from database. REST API is an API implementation that adheres to the REST architectural constraints. It acts as an interface. The communication between the client and the server happens over HTTP. A REST API takes advantage of the HTTP methodologies to establish communication between the client and the server. REST also enables servers to cache the response that improves the application's performance.

Library used for calling rest Api's

retrofit have been used for calling the rest **Api's** to fetch the data from server to on the Social Brain app.

- It manages the process of receiving, sending, and creating HTTP requests and responses.
- It alternates IP addresses if there is a connection to a web service failure.
- It caches responses to avoid sending duplicate requests.
- Retrofit pools connections to reduce latency.
- Retrofit resolves issues before sending an error and crashing the app.

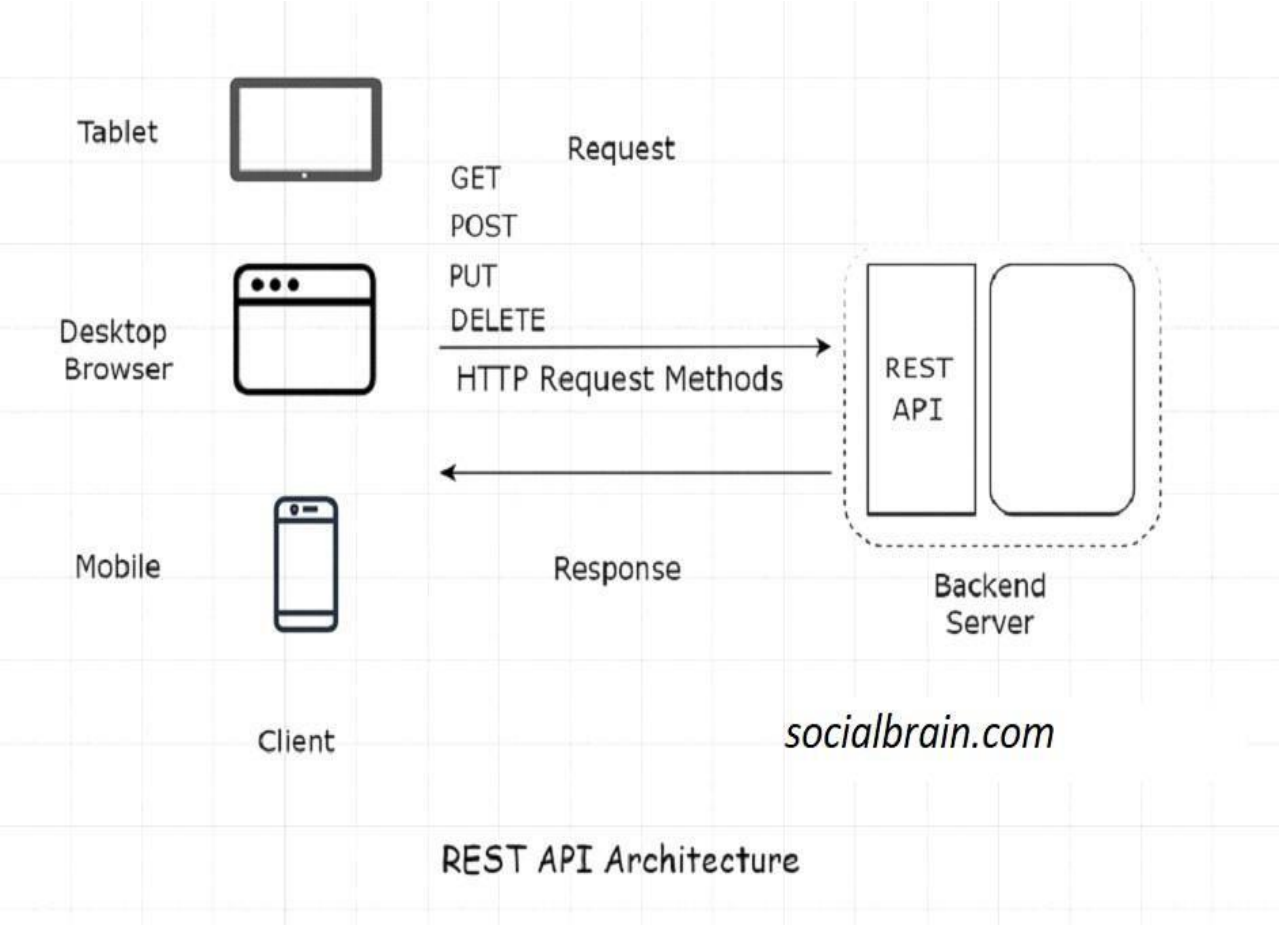
Server Side technologies

MySQL: We have use the MySQl database for saving the data.

MySQL is the most widely adopted open source relational database and serves as the primary relational data store for many popular websites, applications, and commercial products. MySQL is a reliable, stable, and secure SQL-based database management system. The MySQL database is suitable for a wide variety of use cases, including mission critical apps, dynamic websites, and as an embedded database for software, hardware, and appliances.

AWS: AWS supports MySQL in a variety of ways, including a fully managed database service, Amazon Relational Database Service (RDS) for MySQL. Amazon Aurora with MySQL compatibility is also built using MySQL, and Amazon RDS supports the popular MySQL fork project, MariaDB. It can also host MySQL on Amazon EC2 and self-manage the database, or browse the 3rd party MySQL offerings on AWS Marketplace.

Rest Api's flow



REST API Architecture

A website was created to support the app

Detales of evry page of the website