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1-Introduction

1-Problem Definition

“Mental illness affects hundreds of millions of people and loved ones all over the world. One out of four people has a mental illness at some point in their life. Depression is the main cause of physical and mental illnesses around the world.....Schizophrenia and bipolar disorder are among the most serious illnesses that prevent people from living a normal life. . . . Although many people are affected by mental illnesses, many hide and neglect their illness, and discrimination against them is being made” (World Health Organization).

According to the World Health Organization, many people with psychological illness are afraid of being stigmatized because of this disease.

Most of these diseases can be treated, but the National Association for Mental Disorders (NAMI) reported that last year, about 60 percent of adults in the US with mental disorders and almost 50 percent of 8 to 15-year-olds did not receive treatment.



Mental health professionals can treat many of the psychological disorders. Therefore, the first step to be taken is to ask a good mental health professional, who is experienced in this field, to thoroughly evaluate your situation.

Of course, one can only benefit from the experience of experts if they accept the treatment. For this, he / she may have the courage to talk with others about the disease. Mental health professionals talk to the patient during treatment to understand the discomfort of the person and to help him solve the problems he faces in his daily life and emphasize how important it

is to stop treatment. It is very important that a relative or friend support the person during these interviews with doctors.

Psychobot, asks questions to the user with the method of cognitive behavioral therapy, and with these questions, he finds out which disease the patient is more inclined to. Psychobot reports the analysis every time the person uses the app and stores it in the organizer.



2-Summary Of Analysis Report

The Analysis phase is where the project lifecycle begins. Firstly in my project analysis report, I

- To ensure that people receive psychological help without shame.
- Contribute to the treatment of individuals who receive treatment directly.
- To improve the quality of life of individuals.
- Considering people's suicidal ideation, they are directed to a hospital.
- To educate healthy individuals who are more calm and able to manage stress in society.
- To teach people how to deal with their disease.

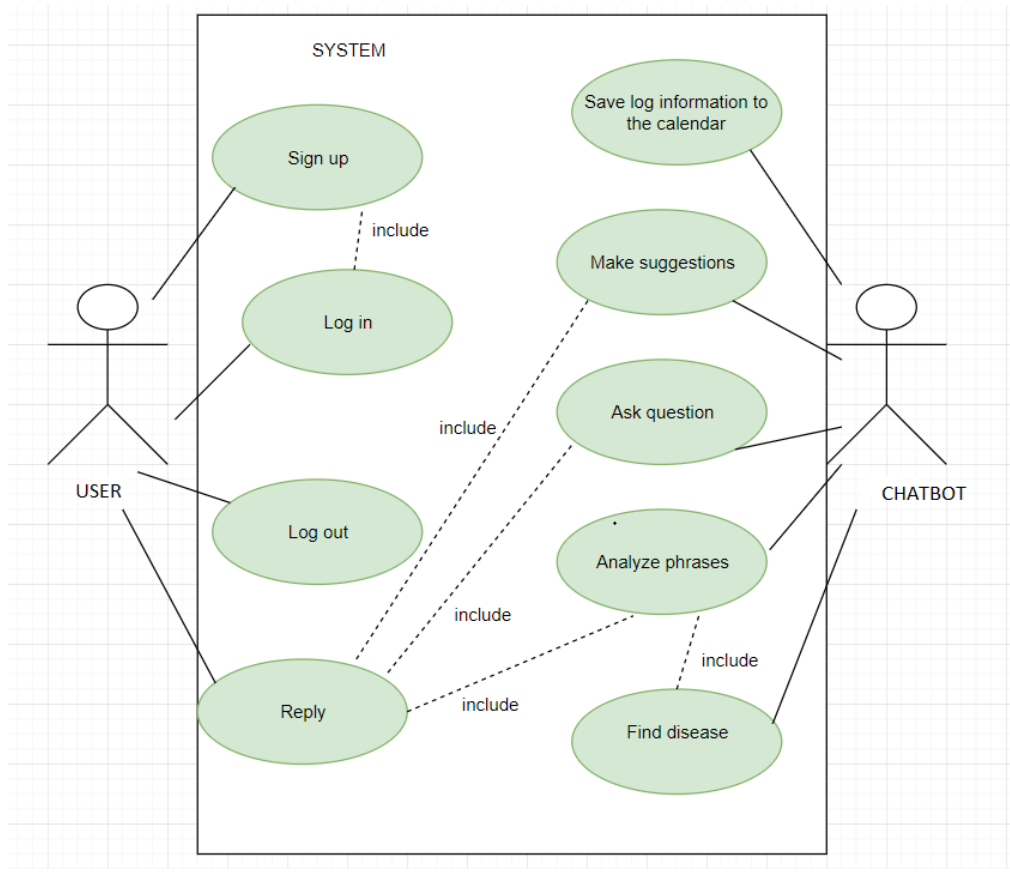
talked about their goals.

Later, I explained that I will take expert opinions from psychologist Ece Gözde Ergür about cognitive behavioral therapy and detection of mental disorders.

I have stated how to identify which diseases I will include in the project organization and examined similar examples of projects.

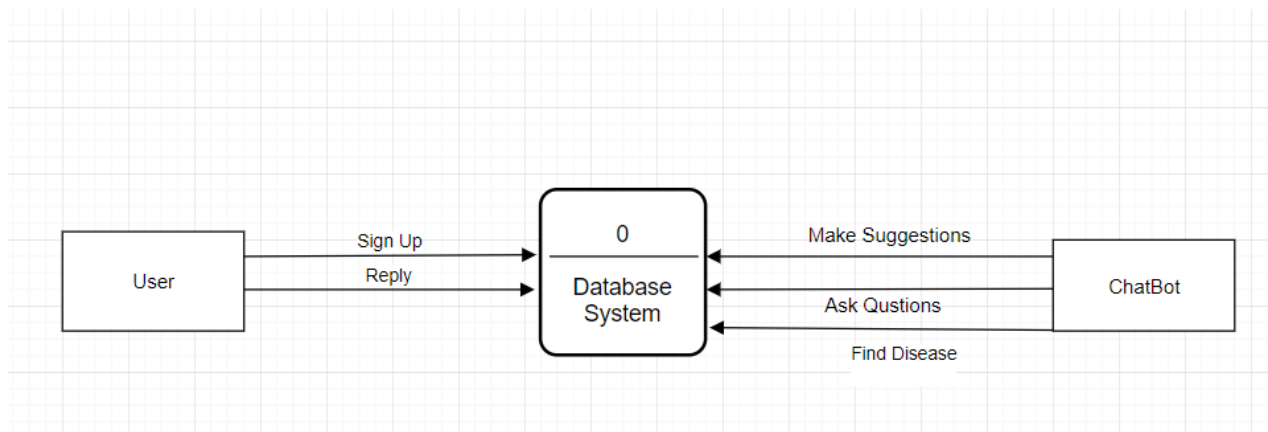
And finally, I included gantt chart ,tools,project data flow diagram,project state diagram,project use case diagram,project risk analysis, project resources that should be included in an analysis report.

3-Use Case Diagram

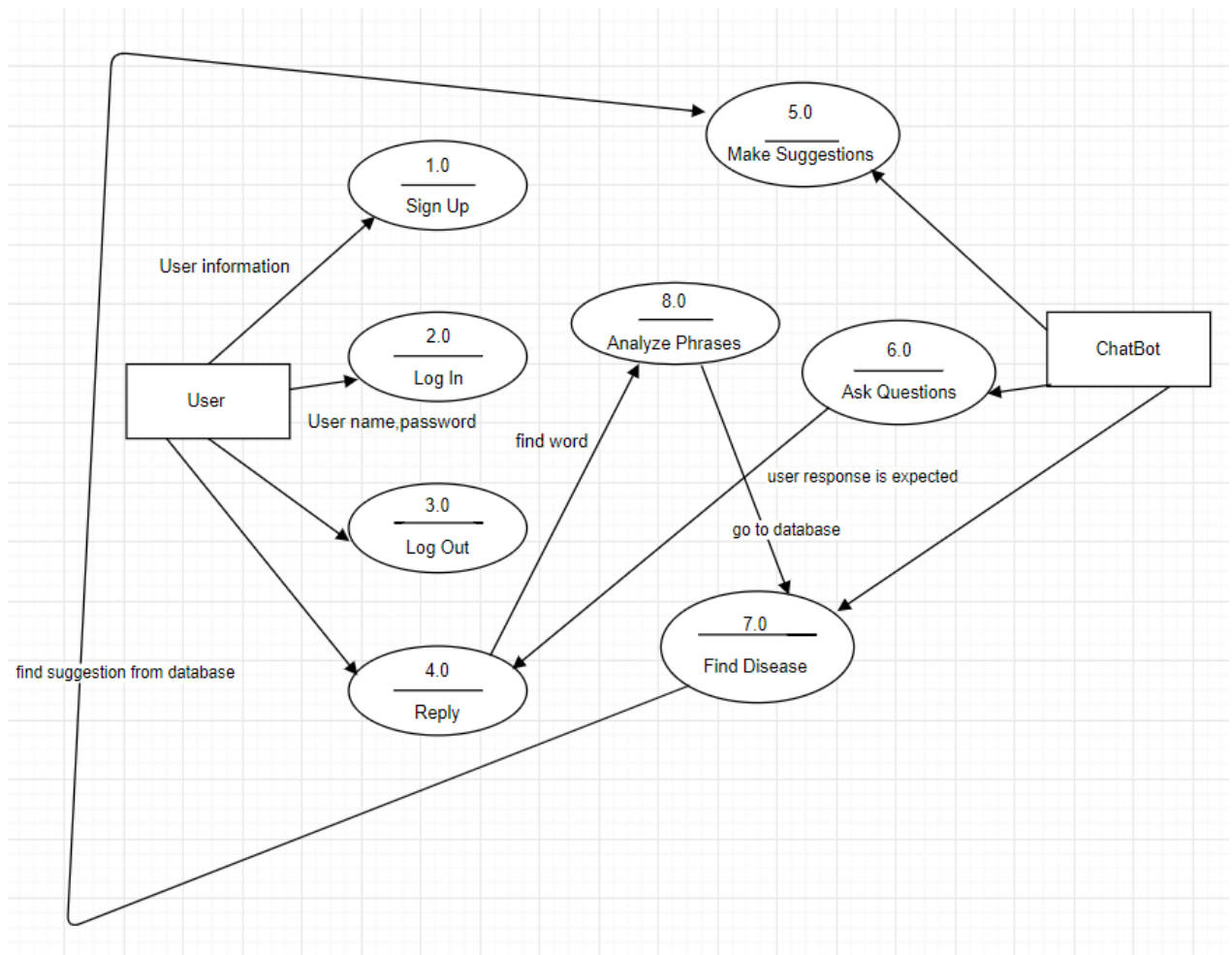


4-Data Flow Diagram

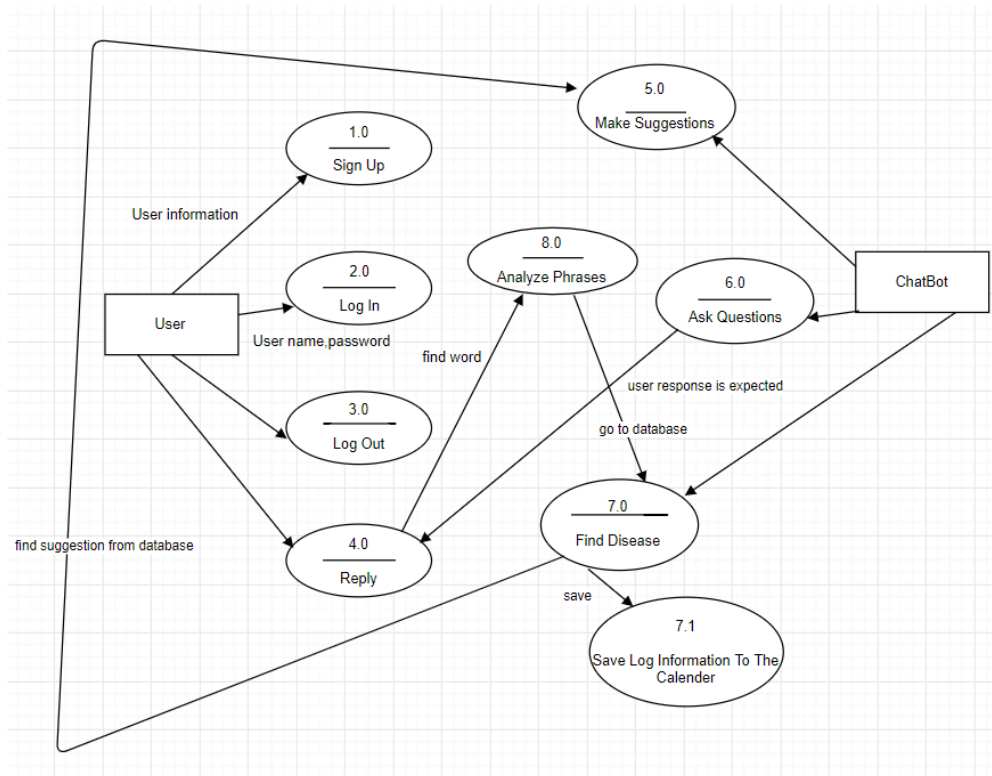
Context



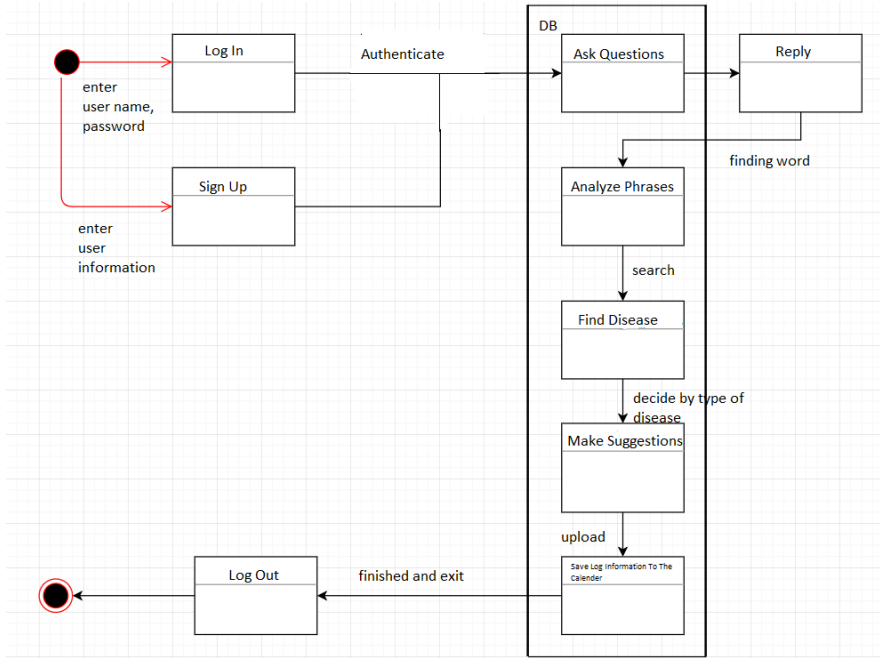
Level 0



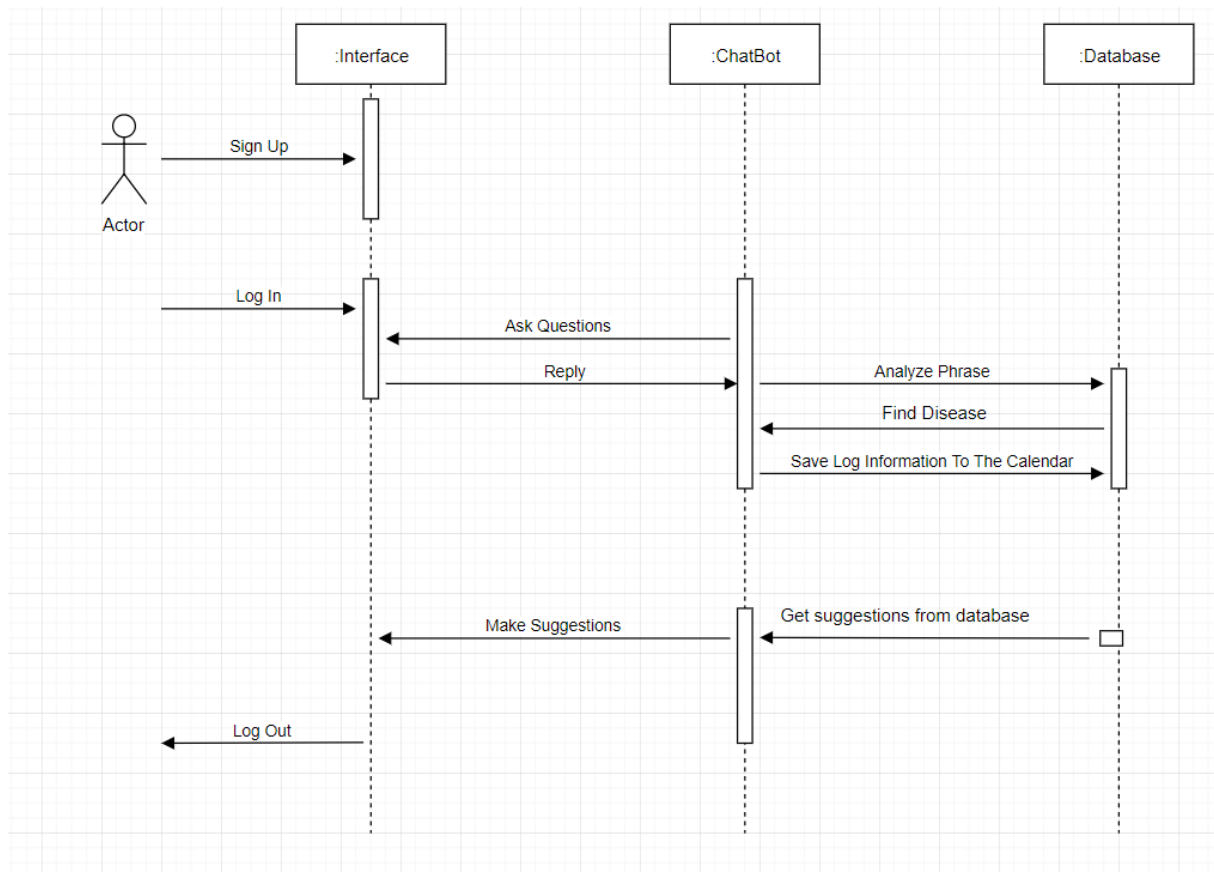
Level 1



5-State Diagram



6-Sequence Diagram



7-Design Considerations

In this section, assumptions, dependencies and constraints in the design of this system is explained.

7.1- Design Assumptions, Dependencies and Constraints

7.1.1-Assumptions, Dependencies

When designing this project, I had to make some assumptions about software, hardware and the environment. First of all, our program is intended to work as a mobile application. If it is desired to change the work platform, some simple changes should be made.

With regard to hardware, I expect the user to have a mobile device to run the application. In addition, the user must be a member of the program to access the chat and the user should log in with the user name and password

7.1.2 Design Constraints

7.1.2.1 Time Constraints

The program of the project was decided at the beginning of the spring semester of the 2019 academic year. At the end of this period, a demo has to be implemented. The project is planned to be completed by the end of May and a detailed program has been made for this purpose. The detailed program can be found in the Gantt charts in Chapter 9 of this initial design report. All work is for the efficient execution of the project.

7.1.2.2 Performance Constraints

Performance will be an important issue as the project will be detected in real time and the user may have limited time. For this reason, several tests will be frequently performed before passing through each step of the project. Also, since the project works in real time, the user must be a quick member and should be able to log in quickly. To meet this limitation, the process running in the background of the application must be implemented with the fastest possible algorithms.

7.1.2.3 Experience Of The Project Developer

I have very little knowledge of interface development, database creation. Since I have no experience in mobile application development, chatbot development and sentence analysis, I have researched how to combine all of these issues together and what tools I can use. I continue my research because of some problems with the project.

7.1.2.4 Financial Constraints

Since the aim of the project is mainly to guide people with mental illnesses such as anxiety, depression, stress, etc., I need to create a quick practice. At first, I intend to implement this project on mobile phones. At this point, I have the opportunity to prepare and present my project with a laptop. My project will not create a financial constraint because it does not require any extra hardware or software.

7.1.2.5 Device Dependent Restrictions

The user must have sufficient charge due to the use of the mobile device. The mobile device must be pre-charged or the portable charger must be kept together since it may not be suitable for charging.

8-Implementation Environment

8.1-Libraries And Tools

1-)Kotlin

Kotlin emerged by JetBrains in 2010. Kotlin is a free, open-source programming language that is statically developed under the Apache 2.0 license. You can support Kotlin and contribute to the development of Kotlin. Kotlin is a static programming language. Kotlin is an open source project developed under Apache 2.0 license, and is open to support and assistance.

Kotlin is an object oriented functional language. Java is an object-oriented programming language, such as C# and C++.

Kotlin and Java work together. You can use Kotlin in Java , and you can use Java in Kotlin. You can easily translate the Java code written in Android Studio into Kotlin language.

2-)DialogFlow

Dialogflow is Google's dialogue system development platform. It allows you to design and develop interfaces based on conversation and speech from actions to Facebook Messenger bots. NLP engine, machine learning option, working in the cloud with the help of the developer relieves the burden.

A few of the features Dialogflow offers:

NLP Engine: There are NLP engines available for many languages including Turkish.

Machine Learning: After each training and every intention (intent), the data set is updated automatically.

Intent Creation: Determines the intentions of the user, provides the preparation of appropriate answers and training. Allows the extraction of all flow and experience design.

Entity Creation: Enables the collection of words (s) under certain values (eg Currency) so that the dialogue system can make sense. He sort of forms his own library.

Training: allows the chat casts to be controlled by an auditor and correct the errors made by the NLP engine and then trigger the machine learning.

Fulfillment: It is the module that allows the external feeding and development of the dialogue system via Webhook and inline editor.

Analytics: Share statistical data in parameters such as session, session stream, triggered intentions.

Integration: allows the dialogue system built on Dialogflow to be integrated into different platforms.

3-)Firebase Realtime Database

The history of the Firebase service is based on the Envolv, founded in 2011 by James Tamplin and Andrew Lee. It is used in a way different from the ones planned by Envolv developers (such as sharing application data in real time with the users in a synchronous way), so that developers can provide web pages with online chat feature via API. For this reason, the founders of the FireBase, which we know in 2012, the foundation of the service separation is decided. Firebase, which is positioned as a mobile and web application development platform, which has many developments since 2012, is purchased by Google in 2014.

Adding a number of additional features to Google after the purchase, the service claims to meet all of the small and medium-sized application development needs. For this purpose, the free service (Spark Plan) also offers (in addition) the service as of the beginning stage of the control panel, the user data store, recording, session and screen display applications such as notification to the transmission of notification and provides access to management without platform difference.

To highlight a few features;

Application management,

User activities,

Data storage,

Notification sending.

Firebase does not need any code writing on an extra server and server side. Features that can be used for this purpose; Realtime Database, Notification and Remote Config. On the other hand, Firebase, which is an alternative to Google Cloud Messaging (GCM) used for instant

notification delivery with Firebase Cloud Messaging (FCM), keeps the data in JSON (JavaScript Object Notation) format as tables in the database structure and root-child instead of SQL. With this structure and features, it is possible to send any changes in the database to other users instantly.

4-) Firebase UI

FirebaseUI is an open-source JavaScript library for Web that provides simple, customizable UI bindings on top of Firebase SDKs to eliminate boilerplate code and promote best practices.

The FirebaseUI component implements best practices for authentication on mobile devices and websites, helping to sign-in and sign-up conversion for your app. It also handles cases like account recovery and account linking that can be security sensitive and error-prone to handle. FirebaseUI Auth clients are also available for iOS and Android

5-) MVP Approach

MVP can be summarized as the separation of the presentation layer and the business logic layer within the application. When designing the architecture that should be installed in the Android application, the first step to consider is to separate the application into layers. Such an approach is of particular importance for the stages of both the development phase and the implementation of the subsequent implementation and development of new features.

6-) Kotlin Coroutine

Coroutines are great features available in Kotlin Language.

Coroutines are a new way of writing asynchronous, non-blocking code (and much more)

Coroutine are light-weight threads. A light weight thread means it doesn't map on native thread, so it doesn't require context switching on processor, so they are faster. Coroutines are available in many languages. Basically, there are two types of Coroutines:

-Stackless

-Stackful

One can think of a coroutine as a light-weight thread. Like threads, coroutines can run in parallel, wait for each other and communicate. The biggest difference is that coroutines are very cheap, almost free: we can create thousands of them, and pay very little in terms of performance. True

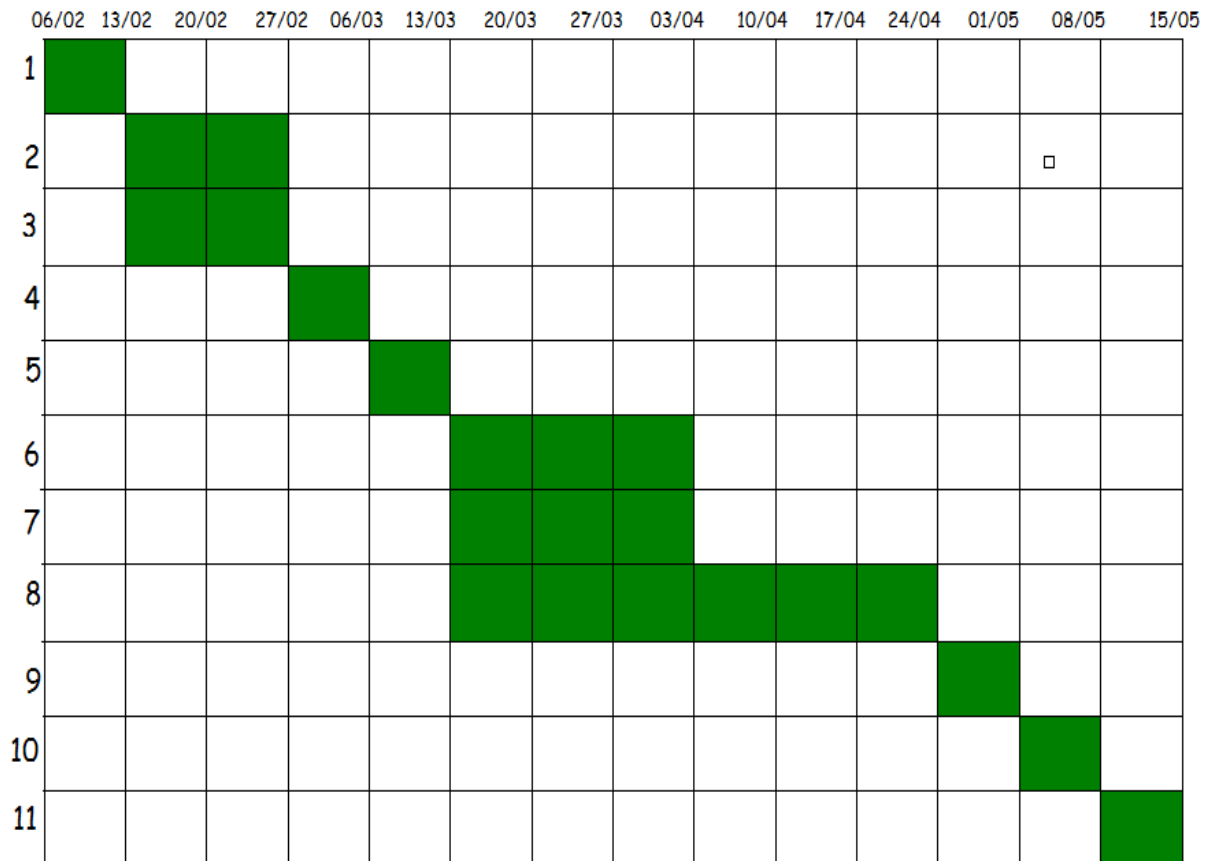
threads, on the other hand, are expensive to start and keep around. A thousand threads can be a serious challenge for a modern machine.

9-Business Calendar and Plan

9.1-Business Packs

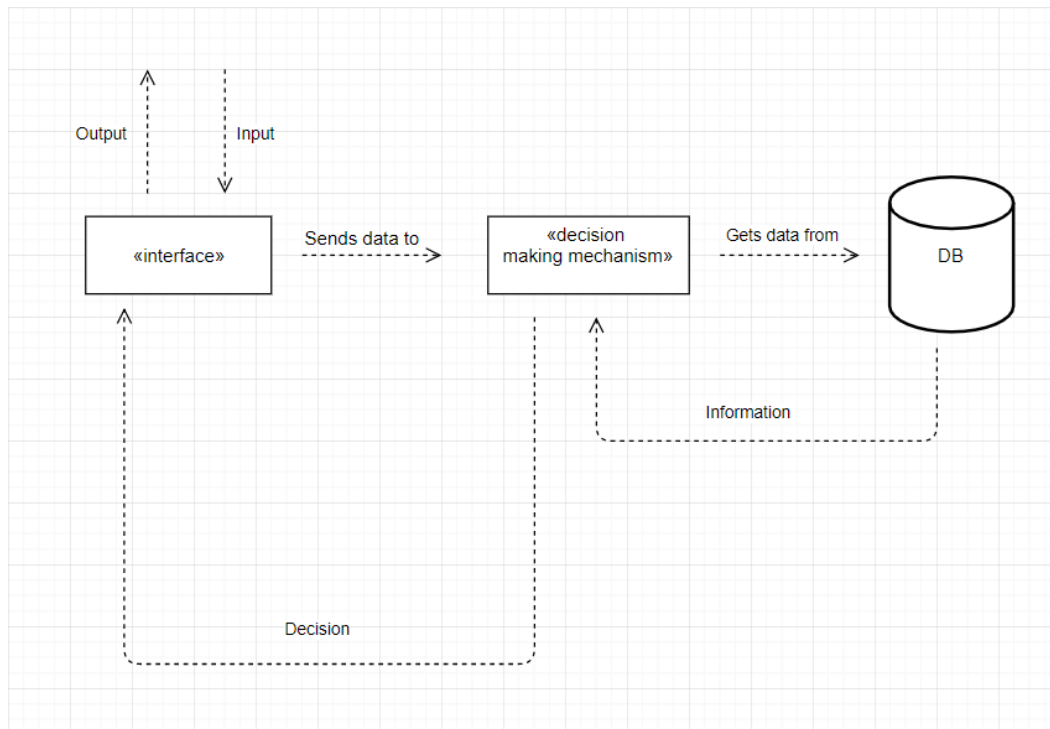
- 1-)Proposal of Project
- 2-)Project Analysis
- 3-)Analysis Report
- 4-)Talking Teacher about project problems
- 5-) Installing Android Studio
- 6-) Android ,FireBase Online Course Trainings
- 7-) Design Report
- 8-)Application Coding
- 9-)Bug Fixes
- 10-)Controls/Testing
- 11-)Final Report Of The Project

9.2-Gannt Chart



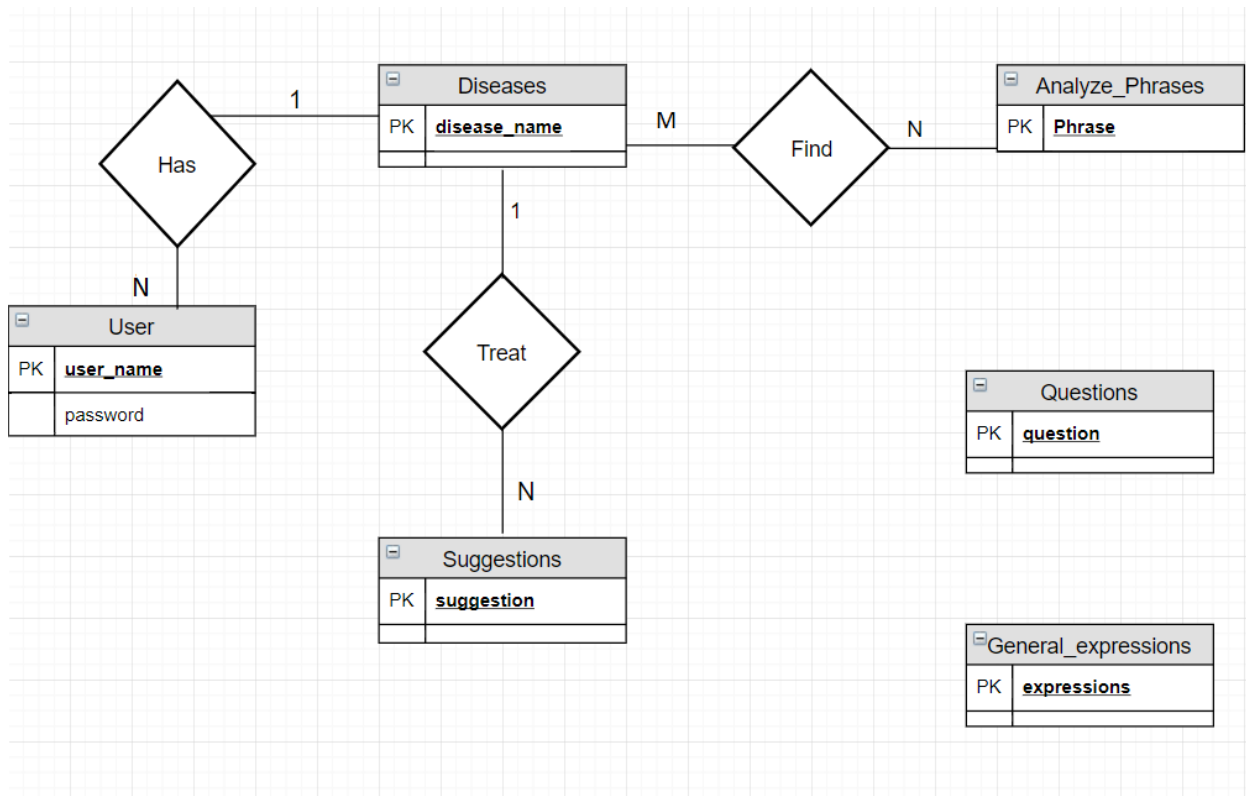
10-Architecture

Architectural design consists of three parts: interface, decision making mechanism and database. Parts are connected to each other in terms of data flow. As the most important part of the design, the interface is responsible for viewing and communicating with the user. This part takes input from the user and sends this data to the decision-making mechanism. The decision-making mechanism performs input analysis and sends important parts of the database. The database sends data according to the relationship it receives. The decision mechanism sends this to the interface as an answer. Because the interface provides the user and other parts to communicate, it sends this to the user.



11-Database Design

11.1- CONCEPTIAL DESIGN



11.2- RELATIONSHIP

User-Diseases(N-1)

Suggestions- Diseases (N-1)

Analyze_Phrases - Diseases (N-M)

11.3- LOGICAL DESIGN

User { user_name, password , disease_name }

Diseases { disease_name }

Suggestions { suggestion, disease_name }

Analyze_Phrases { Phrase }

Questions { question }

General_expressions { expression }

Analyze_Phrases – Diseases { Phrase, disease_name }

11.4- PHYSICAL DESIGN

Create table User (

user_name Char(30) ,

password Integer

Primary Key (password),

Foreign Key (disease_name) references Diseases (disease_name)

);

Create table Diseases (

disease_name Char(30) ,

Primary Key (disease_name),

);

Create table Suggestions (


```

suggestion Text ,

disease_name Char(30)

Primary Key (suggestion),

Foreign Key (disease_name) references Diseases (disease_name)

);

Create table Analyze_Phase (

Phrase Char(30) ,

Primary Key (Phrase),

);

Create table Questions (

question Text,

Primary Key (question),

);

Create table General_expressions (

expression Text,

Primary Key (expression),

);

Create table Analyze_Phrases – Diseases (

Phrase Char(30) ,

disease_name Char(30) ,

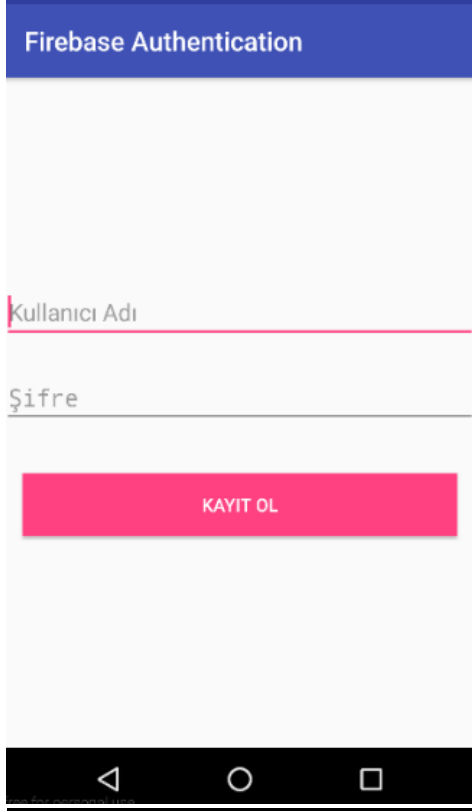
Primary Key (Phrase,disease_name),

Foreign Key (disease_name) references Diseases (disease_name)

Foreign Key (Phrase) references Analyze_Phrases (Phrase));

```

12-Interface Design



Registration screen for Firebase Authentication. The screen has a blue header with the text "Firebase Authentication". Below the header, there are two input fields: "Kullanıcı Adı" (Username) and "Şifre" (Password). A red "KAYIT OL" (Register) button is positioned below the password field. The screen is framed by a black border, and the Android navigation bar is visible at the bottom.



User management screen for Firebase Authentication. The screen has a blue header with the text "Firebase Authentication". Below the header, there are three buttons: "Şifre Değiştir" (Change Password), "E-posta Değiştir" (Change Email), and "Çıkış Yap" (Logout). The screen is framed by a black border, and the Android navigation bar is visible at the bottom.



13-Project Resources

-ceng.metu.edu.tr

- <https://medium.com/lodos/bir-chatbot-da-dialogflowdan-b1c180d0c93>

- <https://towardsdatascience.com/chatbots-arent-as-difficult-to-make-as-you-think-f7f90255b993>

-<https://hackernoon.com/add-chatbot-to-your-android-app-524556c058ab>

- <https://codeburst.io/2-how-assistant-work-introduction-to-dialogflow-319a72ba2db>

- <https://www.jw.org/tr/yayinlar/dergiler/g201412/psikolojik-hastal%C4%B1klar/>

- <https://www.log.com.tr/terapinin-gelecegi-psikolojik-danismanlik-saglayan-yapay-zeka/>

- <https://www.psycom.net/25-best-mental-health-apps>

- İyi Hissetmek Yeni Duygudurum Tedavisi – DR.David Burns

-<http://www.amatem.org/>

-<http://www.psikiyatri.org.tr/halka-yonelik/8/>

-<https://www.umitegrioglu.com/chatbot-nasil-yapilir-microsoft-bot-framework-nedir/>

-<https://medium.com/@peacecwz/chatbot-ve-bot-framework-nedir-7558f4eacfe3>

