GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Government of Maharashtra)

DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2019-20

PROJECT REPORT ON

"Mobile game for early Alzheimer's Disease Detection"

SUBMITTED BY

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UNDER THE GUIDANCE

OF

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GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Government of Maharashtra)

CERTIFICATE

This is to certify that

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Of class Third Year (2019-20) have successfully completed project on "**Mobile game for early Alzheimer's Disease Detection**" under the guidance of "**Mr. T.P.Sharma**" in parallel fulfilment of requirement for the award of Diploma in Computer Engineering from Government Polytechnic, Pune.

Mr. T.P.Sharma	**Mr. U.V.Kokate**	**Dr.V.S.Bandal**
(Project Guide)	(H.O.D)	(Principal)

ACKNOWLEDGMENT

The success of any project depends largely on the encouragement and guidelines of many others.This research project would not have been possible without their support . We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

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INDEX

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

This project is aimed at detection of Alzheimer's disease and analyzing reports by respective doctors; with each level of game covering a important early stage symptom of Alzheimer's disease. The main goal of this Game is to design and implement game which would be able to detect Alzheimer disease and its severity in a easy and attractive way.The game provides different levels which tests if there are symptoms of Alzheimer present in patient. The severity of disease will be calculated on the basis of scores obtain in different levels. Doctor can easily examine patient using this game without any extra effort.

The project focuses on designing and implementing effective games targeting silver-aged and Alzheimer's patients which could help them recover sooner. This project creates a game which is android based that consists of several levels aimed to effectively detect the presence of Alzheimer's if any. According to the answers presented by the patient marks for each one is rewarded and last a total score is produced. A report of this is generated which can produced to the doctor who can then find out effective treatment for the same.

The project highly aims at "caring for those who once cared a lot for us".

Chapter 1

Introduction

1.1 Overview :

Dementia is a syndrome characterized by disturbance of multiple brain functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Consciousness is not clouded. The impairments of cognitive function are commonly accompanied, and occasionally preceded, by deterioration in emotional control, social behaviour, or motivation.

Alzheimer disease is the most common form of dementia and possibly contributes to 60-70% of cases. Other types of dementias include vascular dementia, dementia with Lewy bodies, and a group of diseases that contribute to front temporal dementia. The boundaries between subtypes are indistinct and mixed forms often co-exist.

Dementia can affect a person in different ways, and progression of the disease depends upon the impact of the disease itself and the person's personality and state of health. Dementia can be divided in three stages:

- ✓ early stage – first year or two
- ✓ middle stage – second to fourth or fifth years
- ✓ late stage – fifth year and after

These periods are given as an approximate guideline and not all persons with dementia will display the same symptoms.

The aim of this project is to develop a game that would help in early detection of Alzheimer's. The project focuses on designing and implementing effective games targeting silver-aged and Alzheimer's patients which could help them recover sooner. This project creates a game which is android based that consists of several levels aimed to effectively detect the presence of Alzheimer's if any. According to the answers presented by the patient marks for each one is rewarded and last a total score is produced. A report of this is generated which can produced to the doctor who can then find out effective treatment for the same.

The project highly aims at "caring for those who once cared a lot for us".

1.2 What is Alzheimer?

Alzheimer disease (AD) is characterized by a progressive decline in cognitive function. AD is substantially increased among people aged 65 years or more, with a progressive decline in memory, thinking, language and learning capacity. AD should be differentiated from normal age-related decline in cognitive function, which is more gradual and associated with less disability. Disease often starts with mild symptoms and ends with severe brain damage. People with dementia lose their abilities at different rates.Alzheimer's disease is a condition where neurons within the brain stop functioning, lose connection with other neurons and die. It's the most common cause of dementia, a loss of brain function that can adversely impact memory, thinking, language, judgment and behavior.

Alzheimer's is evaluated by identifying certain symptoms and ruling out other possible causes of dementia. As there is no cure for Alzheimer's disease detecting it at very early stage is very important to decrease its progress.

The pathophysiology of AD is related to the injury and death of neurons, initiating in the hippocampus brain region that is involved with memory and learning, then atrophy affects the entire brain. Amyloid beta, also written Aβ, is a short peptide that is an abnormal proteolytic byproduct of the transmembrane protein amyloid precursor protein (APP), whose function is unclear but thought to be involved in neuronal development. Amyloid beta monomers are soluble and contain short regions of beta sheet at sufficiently high concentration, they undergo a dramatic conformational change to form a beta sheet-rich tertiary structure that aggregates to form amyloid fibrils.

These fibrils deposit outside neurons in dense formations known as senile plaques or neuritic plaques, in less dense aggregates as diffuse plaques, and sometimes in the walls of small blood vessels in the brain in a process called amyloid angiopathy or congophilic angiopathie. In Alzheimer disease abnormal aggregation of the tau protein, a microtubule-associated protein expressed in neurons is also observed. Tau protein acts to stabilize microtubules in the cell cytoskeleton. Like most microtubule-associated proteins, tau is normally regulated by phosphorylation. In AD patients, hyperphosphorylated tau P-tau accumulates as paired helical filaments that in turn aggregate into masses inside nerve cell bodies known as neurofibrillary tangles and as dystrophic neurites associated with amyloid plaques.

1.3 Background:

This project has very specific marking scheme.The scoring pattern is described in chapter 'System Design'.However, the complete game play is inspired by SAGE,eSAGE and MMSE.

Dementia is a growing problem worldwide in both the numbers of afflicted individuals and the cost of their care. In the US alone, there is an estimated 5.4 million individuals with Alzheimer's disease (AD) at a healthcare cost of $236 billion dollars.Perhaps an additional 3–22% of those over 60 years of age may meet criteria for mild cognitive impairment.

Evidence is mounting, especially for AD, that early treatments and potential new disease modifying therapies are most successful in the earliest stages.We unfortunately have a situation where individual patients with cognitive impairment, MCI, and early dementia are typically not diagnosed or identified in a timely fashion to take full advantage of these medications. Therefore, improving the early identification of cognitive impairment must be a priority. Conversations between primary care providers and their patients and families regarding cognitive changes need to start much earlier in the disease course. However, there are many barriers in achieving this goal. Many patients reside in regions with few resources and with limited dementia-knowledgeable healthcare providers, clinical staff, or advocates. Providers may not be sophisticated or experienced in knowing how to screen those with cognitive complaints, which tools to use, or how to administer them. More than 40% of patients with mild dementia are not detected and diagnosed by their healthcare provider. In addition, many patients with MCI or early dementia have impaired insight and do not seek early medical intervention, typically only presenting to their family doctor an average of 3–4 years after cognitive symptoms are noticed by others. There are also some family members who explain away the patient's symptoms, reluctant to accept that their cognitive changes are meaningful. Other barriers include issues of limited reimbursement by Medicare for brief cognitive screening evaluations. Providers and health systems may also have decided that too much time or personnel resources are required to administer cognitive testing more routinely.

The use of easily administered, brief, reliable, validated, practical, and inexpensive screening tools is critical in overcoming the many obstacles in identifying early cognitive changes in individuals. Screening Americans for cognitive impairment at their Medicare Annual Wellness Visit has been encouraged and may provide a baseline prior to potential future decline in their cognitive abilities. Every individual has different natural abilities and so will have different baseline scores on their cognitive testing. There are many excellent cognitive screening tests with good sensitivity and specificity that can differentiate demented subjects from normal individuals. Often they are underutilized due to the demand for personnel time and resources needed to administer them. Many have not been evaluated for efficacy for MCI detection or have shown insensitivity in differentiating normal aging from MCI .

1.3.1 SAGE

The Self-administered Gerocognitive Examination is a brief cognitive assessment instrument for mild cognitive impairment (MCI) and early dementia, created by Douglas Scharre, Professor of Clinical Neurology and Psychiatry at Ohio State University Wexner Medical Center in Columbus, Ohio.

The Self-Administered Gerocognitive Examination (SAGE) is a valid and reliable, 22 point traditional pen and paper multi domain cognitive assessment tool to reduce the typical delay in identifying individuals with MCI or dementia (available for download at sagetest.osu.edu) .Our 2010 paper describes in detail the reliability and validity study of the SAGE test. It establishes inter-rated and test-retest reliability, and equivalence of the four different versions of the test. It also correlated well with other cognitive measures of the same construct. The SAGE test was shown to have high sensitivity and specificity in distinguishing between normal, MCI, and dementia groups. The self administered feature with age and education norms and four equivalent interchangeable forms of SAGE allows it to be given in almost any setting .It takes on the average 13 min to complete and 30–60 s for it to be scored. It is sensitive enough to distinguish between MCI and dementia conditions and has been compared with other commonly used office-based multi domain brief cognitive tests.

The SAGE test contains a series of questions that assess your cognitive functioning. There are actually four different tests from which you can choose, and they are all interchangeable. If you took all four (you only need to take one), you should score essentially the same on each test.Four different tests allow you to be able to take more than one test over time. For example, you could take the test annually for four years in a row. Different tests reduce the chance of inaccurate scores that can result from "practicing" the same test multiple times.The SAGE test involves questions in several different areas, including: Orientation (identifying the month, date, and year),Naming pictures,Similarities,Calculations,Short-term memory,Construction of a 3-D form,Clock drawing test,Animal naming,Trail-making test.Executive functioning (problem-solving).

1.3.2 eSAGE

The original SAGE has been previously described in detail.The digital version of SAGE (eSAGE; commercially known as BrainTest®) made for tablet use, consisting of the identical test questions of SAGE, was produced by BrainTest Inc.through a license agreement with The Ohio State University. The self administered test measures cognitive function in the domains of orientation (date: 4 points), language (picture naming: 2 points; and verbal fluency: 2 points), memory (delayed recall of a

written instruction: 2 points), executive function (modified Trails B: 2 points; and problem solving task: 2 points), abstraction (determining similarities: 2 points), calculations (word problem calculations: 2 points), and visuospatial abilities (copying three-dimentional constructions: 2 points; and clock drawing: 2 points). Nonscored items include demographic information (birth date, educational achievement, ethnicity, and sex), and questions regarding the individual's past history of strokes and head trauma, family history of cognitive impairment, and current symptoms of memory, balance, mood, personality changes, and impairments of activities of daily living. No training is required for the administration of the test and assistance is not allowed. Clocks and calendars were not allowed in the testing rooms. Answers need not be spelled correctly. There is no time limit to complete the test. The subjects used their fingers to draw or type to complete the eSAGE questions on the tablet. A stylus was not permitted. The eSAGE design allowed for the subjects to write on the tablet as a scratch pad to aid in the completion of the calculations section. The subjects had the ability to delete and retype, or return and alter any answer to any question at any time. For those visuospatial and executive functioning questions requiring them to draw with their finger, there was the ability to erase their entire answer and redraw or redo their answer. If more than one response was provided for a question, the best response was scored. Upon completion of the eSAGE the responses were automatically uploaded. The eSAGE program tracked the timing of the responses and the number of erasures for an individual question. It also recorded the subjects drawings in real time so they could be played back later during scoring. Scoring was initially performed by an individual trained on the scoring instructions and verified by a second trained person. Any differences between scores were adjudicated and an agreement between the scorers reached.

1.3.3 MMSE

The Mini-Mental State Examination (MMSE) or Folstein test is a 30-point questionnaire that is used extensively in clinical and research settings to measure cognitive impairment.It is commonly used in medicine and allied health to screen for dementia. It is also used to estimate the severity and progression of cognitive impairment and to follow the course of cognitive changes in an individual over time; thus making it an effective way to document an individual's response to treatment. The MMSE's purpose has been not, on its own, to provide a diagnosis for a particular nosological entity. Administration of the test takes between 5 and 10 minutes and examines functions including registration (repeating named prompts), attention and calculation, recall, language, ability to follow simple commands and orientation.It was originally introduced by Folstein et al. in 1975, in order to differentiate organic from functional psychiatric patients but is very similar to, or even directly incorporates, tests which were

in use previous to its publication.This test is not a mental status examination. The standard MMSE form which is currently published by Psychological Assessment Resources is based on its original 1975 conceptualization, with minor subsequent modifications by the authors.

Advantages to the MMSE include requiring no specialized equipment or training for administration, and has both validity and reliability for the diagnosis and longitudinal assessment of Alzheimer's disease. Due to its short administration period and ease of use, it is useful for cognitive assessment in the clinician's office space or at the bedside. Disadvantages to the utilization of the MMSE is that it is affected by demographic factors; age and education exert the greatest effect. The most frequently noted disadvantage of the MMSE relates to its lack of sensitivity to mild cognitive impairment and its failure to adequately discriminate patients with mild Alzheimer's disease from normal patients. The MMSE has also received criticism regarding its insensitivity to progressive changes occurring with severe Alzheimer's disease. The content of the MMSE is highly verbal, lacking sufficient items to adequately measure visuospatial and/or constructional praxis. Hence, its utility in detecting impairment caused by focal lesions is uncertain.

The MMSE test includes simple questions and problems in a number of areas: the time and place of the test, repeating lists of words, arithmetic such as the serial sevens, language use and comprehension, and basic motor skills. For example, one question, derived from the older Bender-Gestalt Test, asks to copy a drawing of two pentagons.A version of the MMSE questionnaire can be found on the British Columbia Ministry of Health website.

Although consistent application of identical questions increases the reliability of comparisons made using the scale, the test can be customized (for example, for use on patients that are blind or partially immobilized.) Also, some have questioned the use of the test on the deaf.However, the number of points assigned per category is usually consistent:

Category	Possible points	Description
Orientation to time	5	From broadest to most narrow. Orientation to time has been correlated with future decline.
Orientation to place	5	From broadest to most narrow. This is sometimes narrowed down to streets, and sometimes to floor.

Registration	3	Repeating named prompts
Attention and calculation	5	Serial sevens, or spelling "world" backwards. It has been suggested that serial sevens may be more appropriate in a population where English is not the first language.
Recall	3	Registration recall
Language	2	Naming a pencil and a watch
Repetition	1	Speaking back a phrase
Complex commands	6	Varies. Can involve drawing.

Table 1 - MMSE Categorized points

Any score of 24 or more (out of 30) indicates a normal cognition. Below this, scores can indicate severe (≤9 points), moderate (10–18 points) or mild (19–23 points) cognitive impairment. The raw score may also need to be corrected for educational attainment and age. That is, even a maximum score of 30 points can never rule out dementia. Low to very low scores correlate closely with the presence of dementia, although other mental disorders can also lead to abnormal findings on MMSE testing. The presence of purely physical problems can also interfere with interpretation if not properly noted; for example, a patient may be physically unable to hear or read instructions properly or may have a motor deficit that affects writing and drawing skills.

The MMSE has been able to differentiate different types of dementias. Studies have found that patients with Alzheimer's disease score significantly lower on orientation to time and place, and recall compared to patients with dementia with Lewy bodies, vascular dementia and Parkinson's disease dementia. However, systematic reviews of this test have shown no evidence to support this examination as a stand-alone one-time test for identifying high risk individuals who are likely to develop Alzheimer's.

1.4 Common Symptoms of Alzheimer's :

Early stage	Middle stage	Late stage
The early stage is often overlooked. Relatives and friends (and sometimes professionals as well) see it as "old age", just a normal part of ageing process. Because the onset of the disease is gradual, it is difficult to be sure exactly when it begins.	As the disease progresses, limitations become clearer and more restricting.	The last stage is one of nearly total dependence and inactivity. Memory disturbances are very serious and the physical side of the disease becomes more obvious.
Become forgetful, especially regarding things that just happened	Become very forgetful, especially of recent events and people's names	Usually unaware of time and place
➢ May have some difficulty with communication, such as difficulty in finding words ➢ Lose track of the time, including time of day, month, year, season ➢ Have difficulty carrying out complex household tasks ➢ Mood and behaviour: may become less active and motivated and lose interest in activities.	➢ Have difficulty comprehending time, date, place and events; may become lost at home as well as in the community ➢ Have increasing difficulty with communication (speech and comprehension) ➢ Behaviour changes may include wandering, repeated questioning, calling out.	➢ Have difficulty understanding what is happening around them ➢ Unable to recognize relatives, friends and familiar objects ➢ Behaviour changes, may escalate and include aggression towards carer, nonverbal agitation (kicking, hitting, screaming or moaning)

Table 2 - Common symptoms experienced by people with dementia syndrome (from the WHO Dementia Report in reference)

1.5 Purpose:

Through this project we present a comprehensive solution for early detection of Alzheimer. This system, is easy to understand, easy to use and offers the simplicity of fast point-and-click service. This project presents an android based game with various stages to help early detection of Alzheimer of silver-aged people or patients. This system aims at caring the people who once cared a lot for us.

1.6 Need:

Alzheimer's disease is one of the biggest concerns many of us have as we get older. The thought of developing the disease can be a frightening prospect, especially if you've witnessed a loved one affected by dementia. By identify and controlling your personal risk factors and leading a brain-healthy lifestyle, you can maximize your chances of lifelong brain health and preserve your cognitive abilities. In order to achieve this a comprehensive solution that provides a way to fight against Alzheimer is what the project aims

Chapter 2

Project Plan

2.1 Software Model:

- For this project, we use iterative model.
- Iterative process starts with a simple implementation of a subset of the software requirements and iteratively enhances the evolving versions until the full system is implemented.
- At each iteration design modifications are made and new functional capabilities are added. The basic idea behind this method is to develop a system through is to develop a system through repeated cycles and in smaller portions at a time.

2.2 Approach in project development:

The project is developed following the SMART approach.

- ❖ Specific
- ❖ Measurable
- ❖ Achievable
- ❖ Realistic
- ❖ Time-bound

2.3 Goals

The following goals are achieved by this project plan:

1. Software risks are documented for use in planning and tracking the software project.
2. Software project activities and commitments are planned and documented.
3. Affected groups and individuals agree to their commitments related to the software project.
4. Project is scheduled and documented.
5. Gives the desired output

2.4 Project Scope

AMYPAD is a graphical tool used to aid in the design and creation of games for alzheimer's detection .This project will consist of creating a marketable game based upon the SAGE and MMSE technique for early Alzheimer's Detection.. The project was be completed by May,2020. Modules of the

game will include a simple levels that hots each symptom of Alzheimer,Report generation,risk estimation and a way to motivate players to continue to play. Project Deliverables:

- Progress Reports
- Issues Reports
- Weekly Meeting Notes
- Final Game

2.5 Project Risks

Major risks we have determined for this software are as follows:

- Equipment failure

- Late delivery of software

- Technology will not meet expectations

- Changes in requirements

- Deviation from software engineering standards

- Less reuse than planned

Risk Table :

Risks	Probability	Impact
Equipment failure	60%	1
Late delivery	30%	1
Technology will not meet expectations	25%	3
Changes in requirements	20%	2
Deviation from software engineering standards	10%	3
Less use than planned	40%	4

Table 3 - Risk Table

Impact level:

1- High

2- High to Medium

3- Medium

4- Medium to low

5-low

2.6 Project Schedule:

Month schedule	Phase	Number of days required	Work done
December	Topic searching	7 days	Topic searched
December	Topic selection	4 days	Topic selected
December	Project confirmation	1 day	Project confirmed
December-January	Literature survey	7 days	Literature survey done
January	Requirement analysis	7 days	Requirement analysis done
January	Requirement gathering	7 days	Requirements gathered
February	Deciding technology stack	10 days	Technology stack designed
March	Firebase database creation	1 day	Database created
March	Coding according to divided modules	25 days	Created modules
April	Integrating the	15 days	Integrated

	modules		
April	Integrating the database	2 days	Integrated
May	Testing the system	5 days	Tested
May	Adding additional functionalities	7 days	Done
May	Testing the working of modules	2 days	Done
May	Fixing bugs	5 days	Done
May	Result analysis	2 days	Done
May	Report	2 days	Done

Table 4 - Project Schedule

Chapter 3

Requirement Analysis

This chapter will explore the system requirement analysis (Functional and non-functional requirements) and requirement specifications.

3.1 Hardware Requirements:

- System : Qualcom / OctaCore processor.
- Clock Speed : 3.0 GHz.
- Hard Disk : 1 GB (max).
- Mobile : Android
- Ram : 500 Mb (or more)

3.2 Software requirements:

- Operating system : Android (Marshmallow and above)
- Language : Android SDK 2.3 above
- Front End : Java,xml,LottieFiles,Ok Google..,Google Translate,BootStrap
- Back End : Firebase,PHP,web host.Heroku
- Web server : Webhost

❖ Technology Stack

Figure 1 - Android Studio

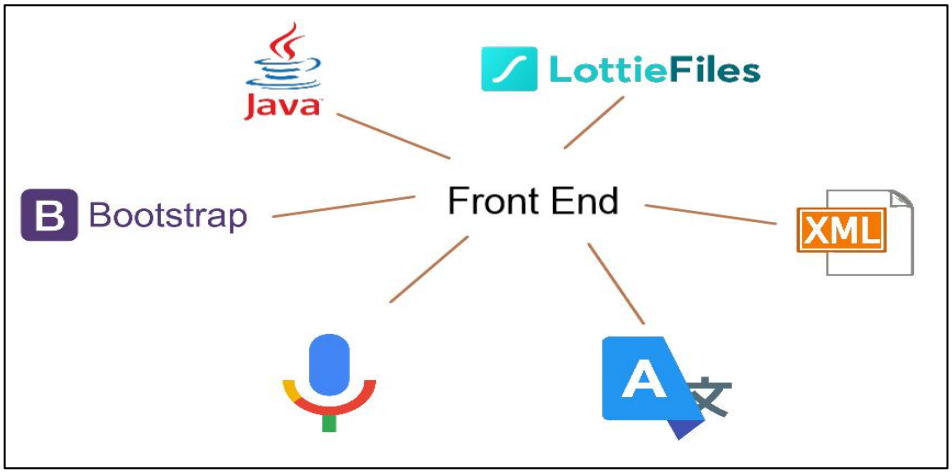


Figure 2 - Front End

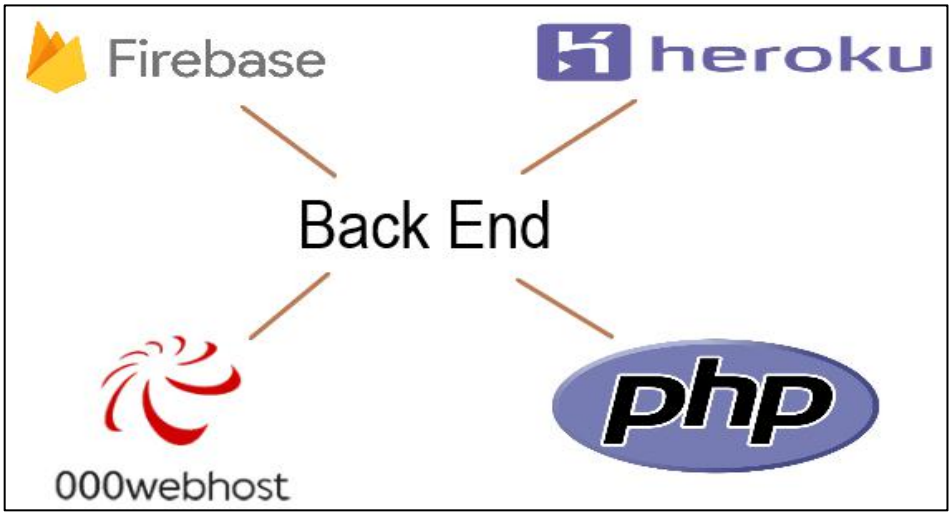


Figure 3 - Back End

3.3 Android :

Android is a mobile operating system developed by Google. It is based on a modified version of the Linux kernel and other open source software, and is designed primarily for touchscreen mobile devices such as smartphones and tablets

3.4 Firebase :

The Firebase Realtime Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code. Data is persisted locally, and even while offline, real-time events continue to fire, giving the end user a responsive experience

Chapter 4

System Design

4.1. Modules

The proposed system is divided into two different modules as follows:

- User (i.e the suspected patient)
  - ✓ Level 1
  - ✓ Level 2
  - ✓ Level 3
  - ✓ Level 4
  - ✓ Level 5
  - ✓ Level 6
  - ✓ Level 7
  - ✓ Level 8
  - ✓ Custom Test
- Doctors (or the Neureologists)
  - ✓ View Report
  - ✓ Send mailed medications

4.1.1 User :

User have to register once to create an account, then login anytime. After login, he/she can play the levels and test his / her cognitive abilities . User is provided with native language facility i.e he / she can choose to play the levels according to his/her lingual pattern.

A] Level 1 - Drag'n'Drop

Early Alzheimer's disease symptoms have shown that major patients who are falling for Alzheimer's start to loose the ability of recognizing common things and incidences. This level checks the patients recognition abilities.The UI provides two buckets at the bottom of the screen and few objects floating around above.The user is expected to recognize the object and decide about its category.Then the user drags the object in appropriate bucket. The wrong sound is played if the user drags wrong object in any bucket.Maximum score this level can give is 5 i.e On dragging of two correct objects the user gets 1 point.

B] Level 2 - Date'n'Time

The next symptom that every Alzheimer's Patient face is forgetfulness.The patient tends to forget the day,date and timing of the day . Patient starts forgetting how and whan a particular date or time occurs.This level hits this symptom.The Patient is given a statement like., "Its 3 'o' clock in morning" after reading such statements , the patient is provided with time picker and he/she has to select the time accordingly. Similarly the patient is also provided to a statement to pick a date.If both date and time are selected correctly the user gets 2 points.

C] Level 3 - Objects in the image

Alzheimer's patient easily forget their things.They don't remember where the things are placed and tend to forget the location of things placed.This misplaces their things.This level deals with this symptom. User is provided with an image which contains alot of objects placed at different locations.The user has to identify the location and the object placed at location and select the buttons accordingly.8 objects totals to 4 points.

D] Level 4 - Remember the 'n'

Patient prone to alzheimers starts forgetting the mobile numbers,telephone numbers,state or city in which he/she lives,his/her name and surname,STD codes,Street number,house number,flat no,etc.This levels checks the patients ability to remember something.In this level the patient is made to remember a no. for 10 seconds and he/she is asked to write that same number on another screen.If patient writes the correct number he/she scores 2 points else no points.

E] Level 5 - Story Telling

Alzheimer's Patient easily erases the events from his/her mind.He/She starts forgetting about the events that just took place.They start asking for food immediately after they had their launch,they forget they took the bath and wishes to bath again,they forget if someone has asked them to do something,they even forget to take pills or forget if they have had already taken the pills.Thus Alzheimers causes to forget the events and incidences happened.This level shows a video to the patient in which various incidences of Binnu and his family(video characters) are shown.Once the vvideo is finished the patient is asked 5 questions based on the incidences which took place with Binnu.One correct answer gives 1 point to the user.Thus,this level can score maximum 5 points.

F] Level 6 - Tricky Tricks

Alzheimer's Patient looses the ability of problem solving.He/She has no idea of common things and facts which a non-alzheimer's person is aware of.In this level the user is asked few basic and common questions regarding everyday life. This checks the patients cognitive abilities.Each question in aset of 5 questions has 4 options and the user has to select one.Each correct slection fives 1 point,which makes the total of 5 points.

G] Level 7 - The Voice Tells !

The patients suffers from listening problems i.e though the patient can hear everything properly,he/she can not get what is being spoken. The patient tends to forget what a particular word means.Therefore,this level is specially designed to check this sumptom.In this,patient is provided 4 audios speeking out different words.The patient has to hear them out and select the appropriate image corresponding to the audio sound.Each audio has 4 option images to select.If the patient identifies all correct images he/she gets 4 points.

H] Level 8 - Speak out

The early to middle staged symptoms of Alzheimers have shown that the person forgets what he/she wanted to speak.Patient cannot quickly remember the words to complete a sentence and thus suffers while speaking.This makes the patient anxious and he/she starts loosing the hopes of recovery as he/she is unable to express what they feel or what they want or how they want something.So in this level the patient is made to speak out words starting from the letter 'a'…he is given only one chance to speak and this happens very spontaneously.If the patient can speak more than 5 words in one take he/she scores 3 points ,if greater than 3 words then 2 points else no point.

I] Custom Level - Paint out

All the above levels can played eevn in the absence of a doctor or a neureologist.But when we see the traditional examination methods,when the doctor examines the alzheimer's patient ,the patient is provided a pen and a paper and the doctor asks him/her to draw a specific object or to draw a specific letter or write something.This level eliminates the need to paper pen while on-spot exmination.This level provides a blank canvas and a brush with different colors and sizes.The patient can easily draw or write whatever is asked to.The Neureologist or the doctor may ask questions like: 'Draw a click showing 3:00' or 'Which color the brush has currenly' or 'Write your full name',etc.

J] Scoring Pattern

AMYPAD screening is not a diagnostic test of any condition. Our research has shown that it can often, but not always, indicate whether individuals fall into the normal range, have mild memory or thinking impairments, or have a more severe memory or thinking condition. Please see the table below.

Score (Maximum Score=30)	**Interpretation**
26 to 30	Individuals with these scores are very likely to be *normal*.
19 to 25	Individuals with these scores are likely to have *mild memory or thinking impairments*.Further evaluation by a physician is recommended.
18 and below	Individuals with these scores are likely to have a *more severe memory or thinking condition*. Further evaluation by a physician is recommended.

Table 5 - Scoring Pattern

4.1.2 Neureologist / Doctor :

The doctors or the neureologist examining the patient are provided with the Detetction Report generated automatically by the game once all levels are finished.Apart from this we also provide a system for the dotors to check the status of the doctor and send mail to the patients.

A] Detection Report

The Detection Report generated after the game includes detailed information about the scores of all the levels that the patients gained.It also calculates total score and percent chances of Alzheimers using the below formulae :

Total Score = level 1 score + level 2 score + level 3 score + level 4 score + level 5 score + level 6 score + level 7 score + level 8 score

Percent Risk = 100 - (Total Score/30 * 100) %

The doctors or the neureologists are also provided a web - based GUI to review the scores and performances of all the patients .Name,Email Id, total scored and percent risk of all the patients is shown in a table.

B] E-mailed medication

As stated earlier doctors are provided web based GUI to review the patient's status.Along with this doctors can also send e-mail to a particular patient regarding his/her medication.

4.2. Database (Firebase)

Here are the screenshots of firebase database and authentication method used for user login.

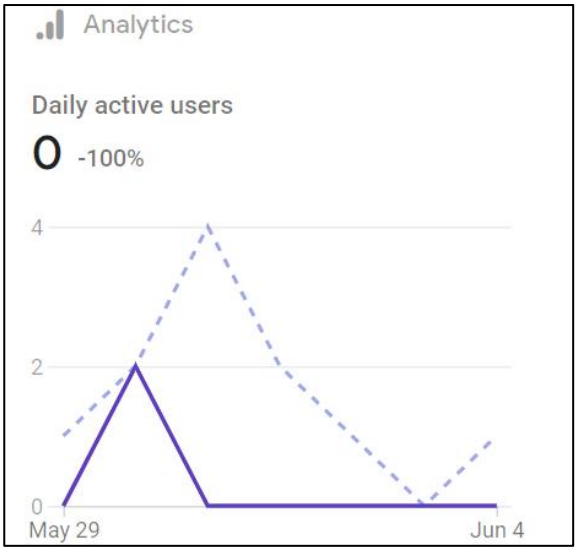


Figure 4 - user analytics

Figure 5 - Download and storage graph

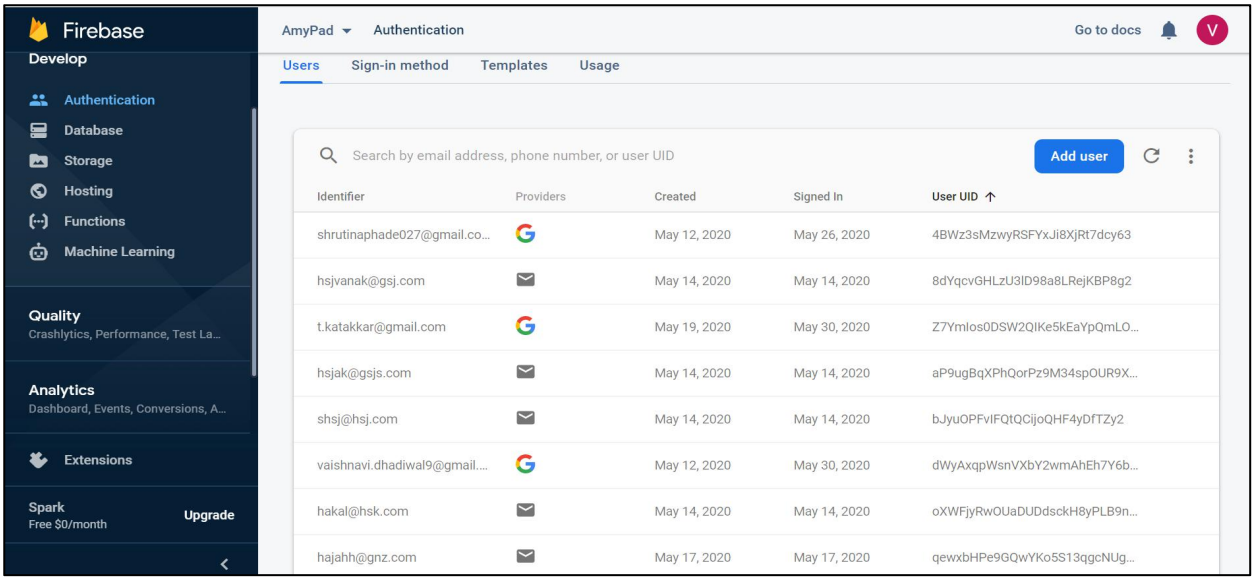


Figure 6 - Firebase authentication

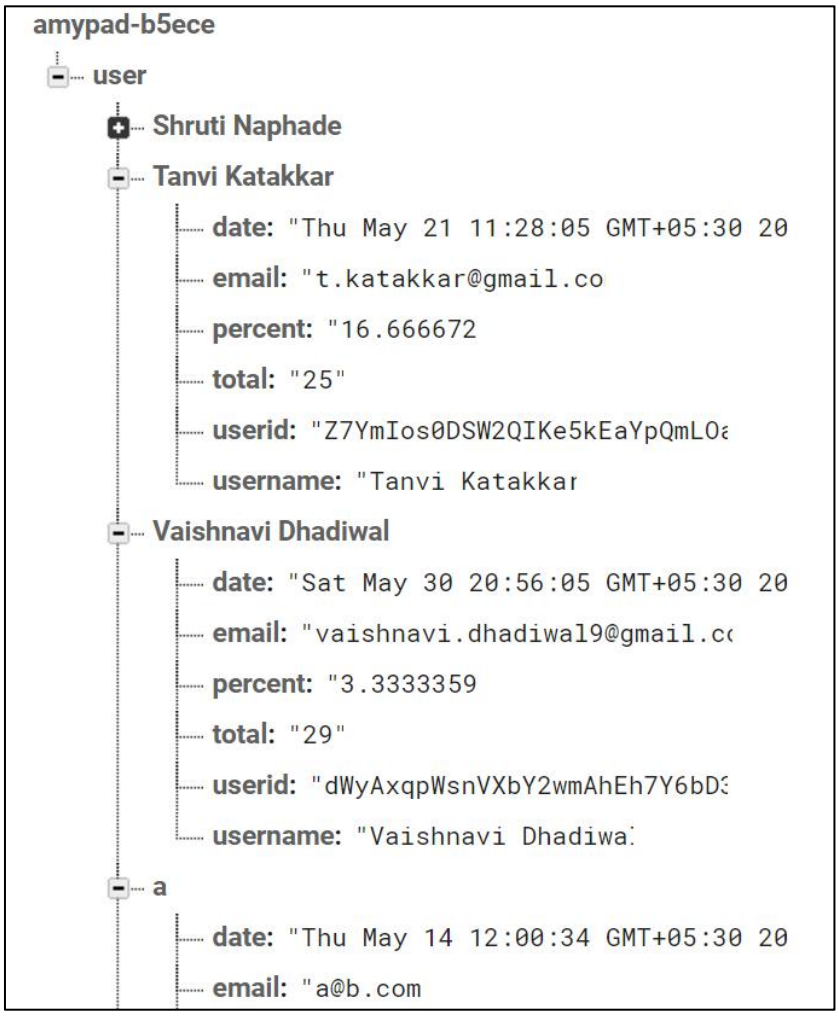


Figure 7 - Database structure

4.3. Diagrams

4.3.1 E-R Diagram :

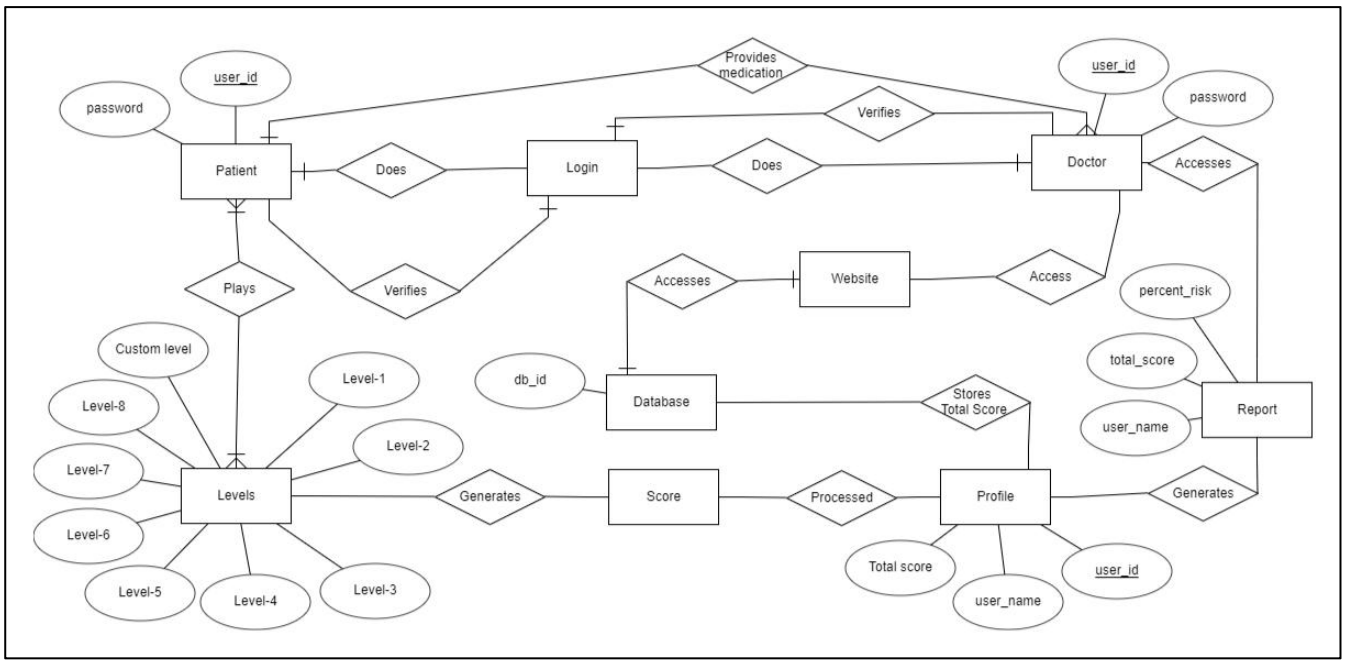


Figure 8 - ER Diagram

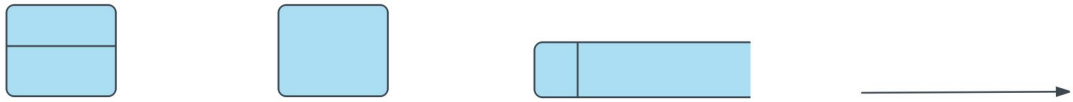
This ER(Entity-Relationship) Diagram is a visual representation of data that describes how data is related to each other. In this, we disintegrate data into entities, attributes and setup relationships between entities.

The entity Patient has attributes user_id and password where 'user_id' is the primary key refernce and is intended to login and play,entity Levels has attributes custom_level , level_1 , level_2 , level_3 , level_4 , level_5 , level_6 , level_7 and level_8 while it generates score which is eventually stored in the entity Profile.This entity has attributes total_score , user_name and user_id and it generates Report.Report entity again has attributes percent_risk , total_score and user_name.

The entity Doctor has the attributes user_id and password where 'user_id' is the primary key refernce.Doctor accesses the Report as well as the website and can give proper medications.

4.3.2 DFD:

Data Flow Diagram (DFD) shown below visualizes the information flows within this system. This neat and clear DFD depicts a good amount of the system requirements graphically.It shows how information enters and leaves this system, what changes the information and where information is stored. The purpose of this DFDs is to show the scope and boundaries of this system as a whole.



(Processes) (Enternal entitiy) (Data stores) (Arrow)

represent how the data flows

- **Level 1 DFD**

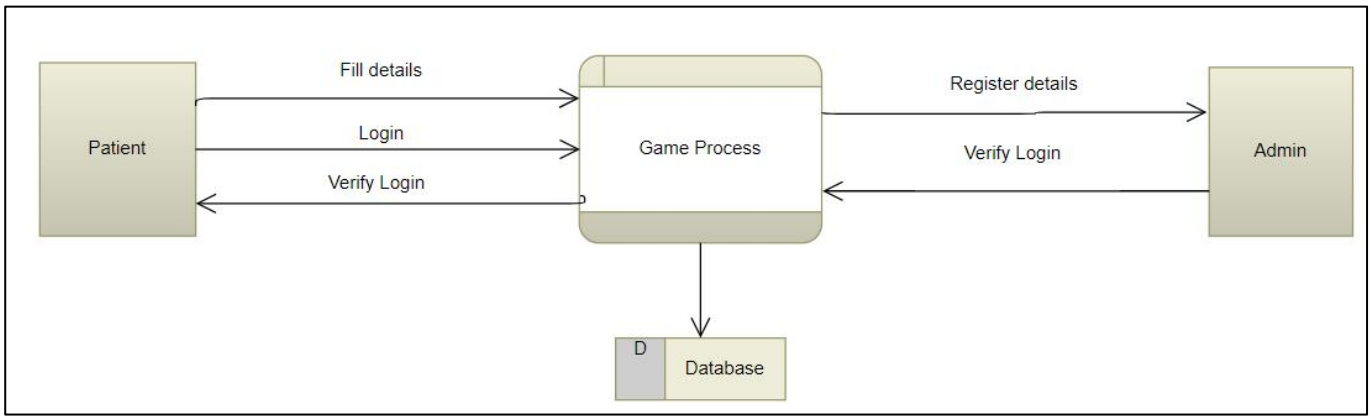


Figure 9 - Level 1 DFD

- **Level 2 DFD**

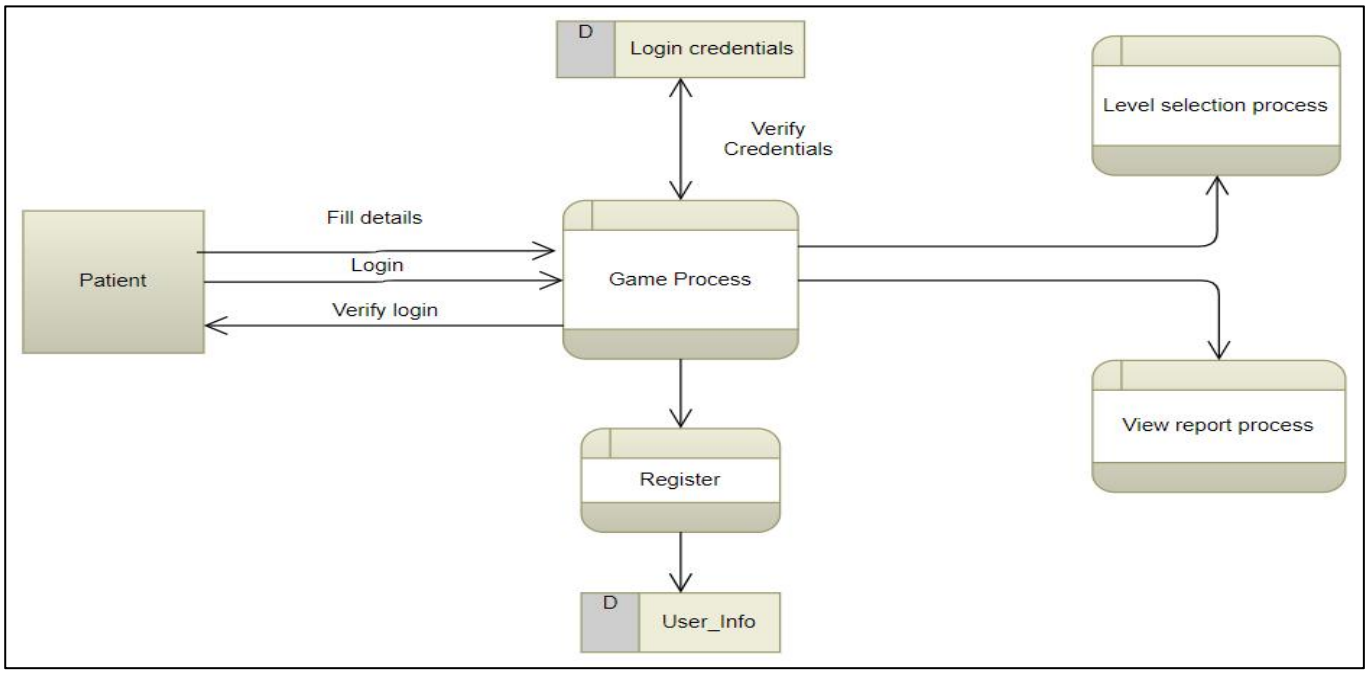


Figure10- Level 2 DFD

- **Level 3 DFD**

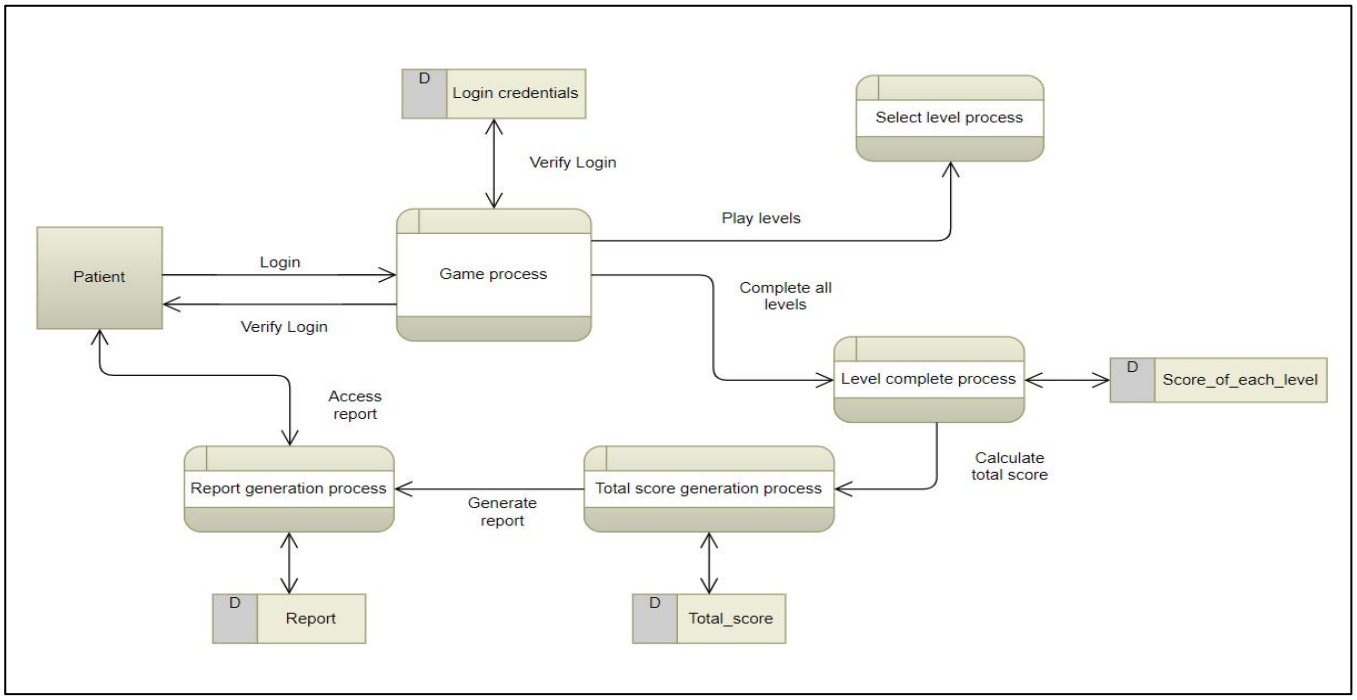


Figure 11 - Level 3 DFD

4.3.3 UML Diagrams:

A] Sequence diagram

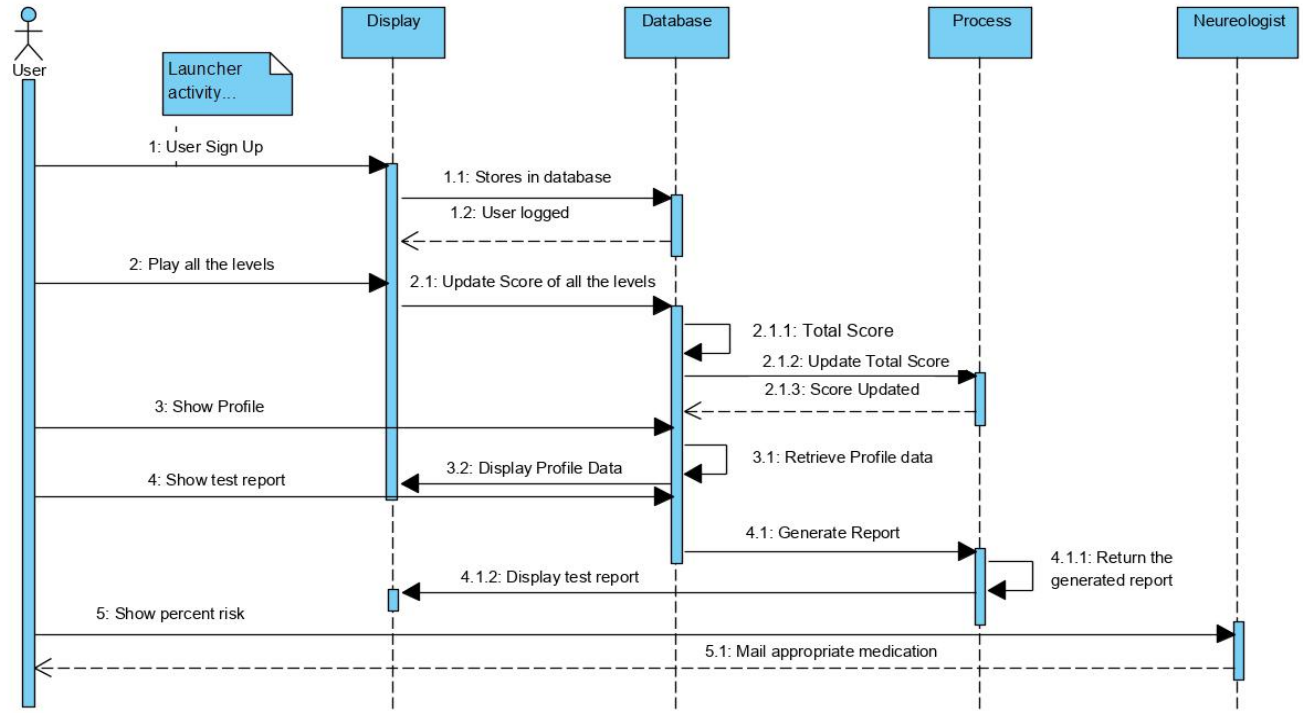


Figure 12 - Sequence diagram

B] Use case digram

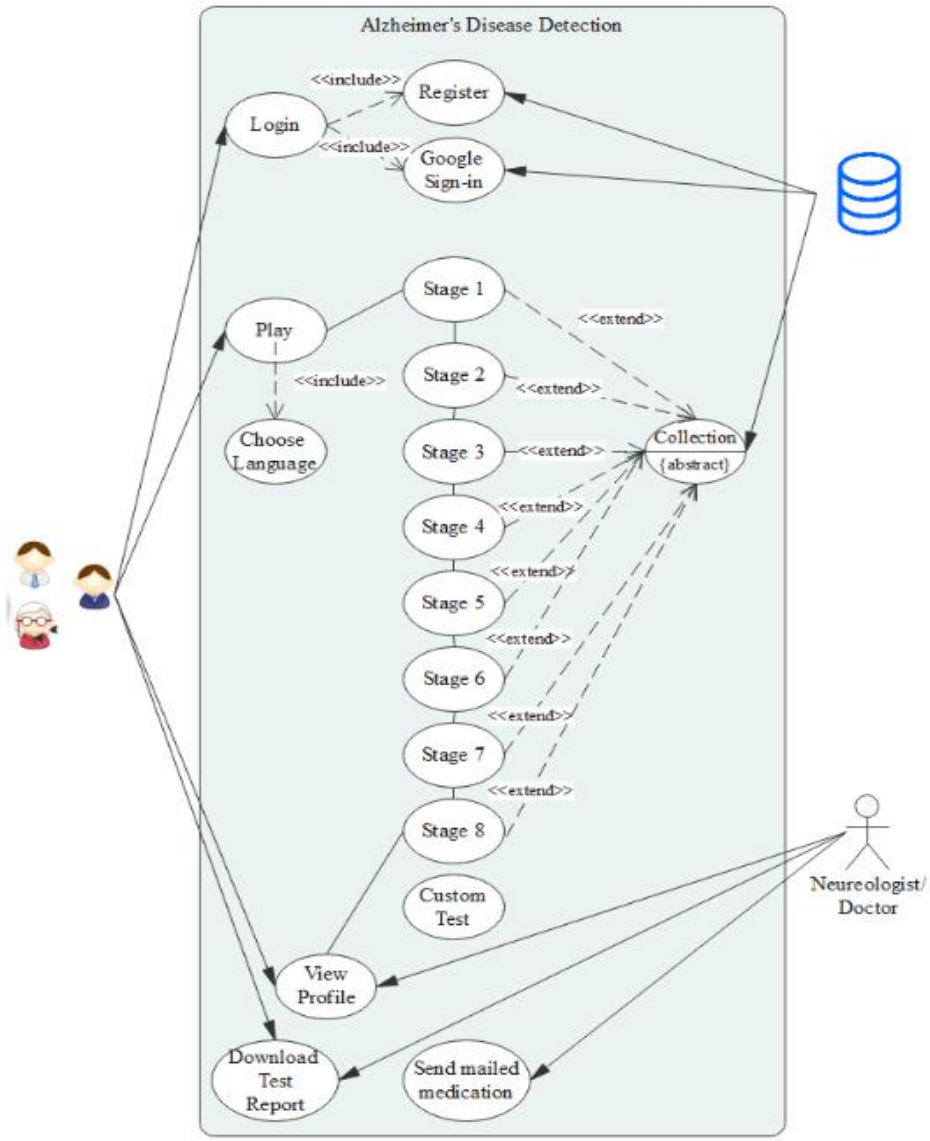
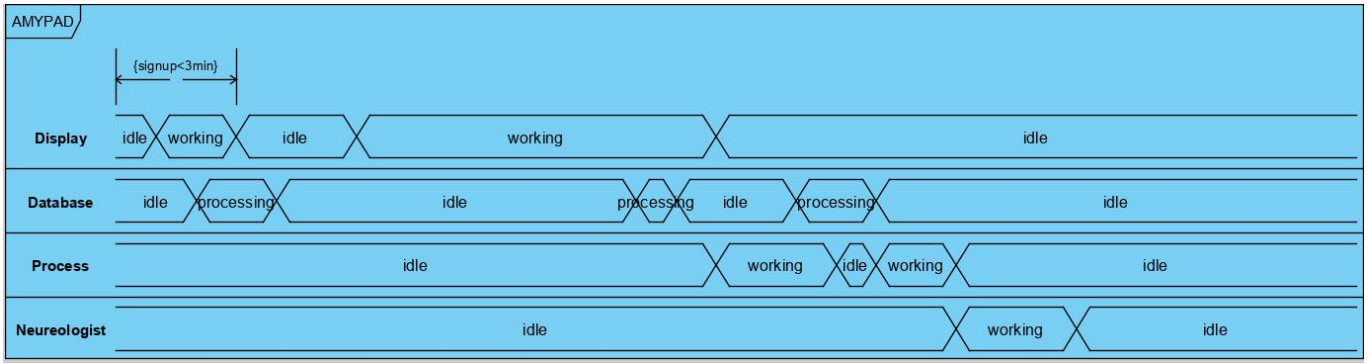


Figure 13 - Use case diagram

C] Timing Digram (Compact mode)



D] Timing Digram

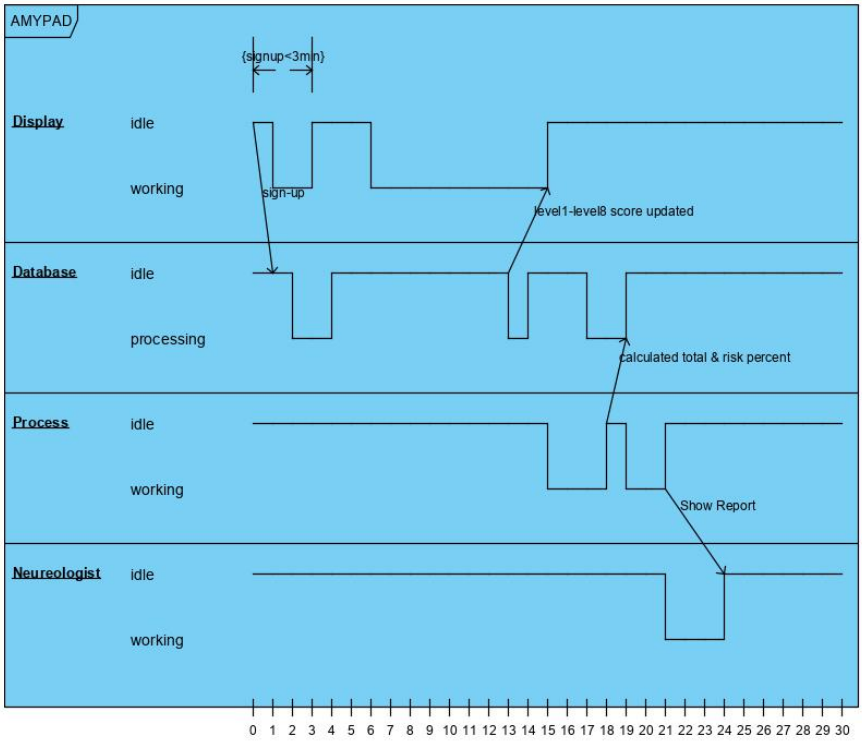


Figure 14 - Timing diagram

E] Class Digram

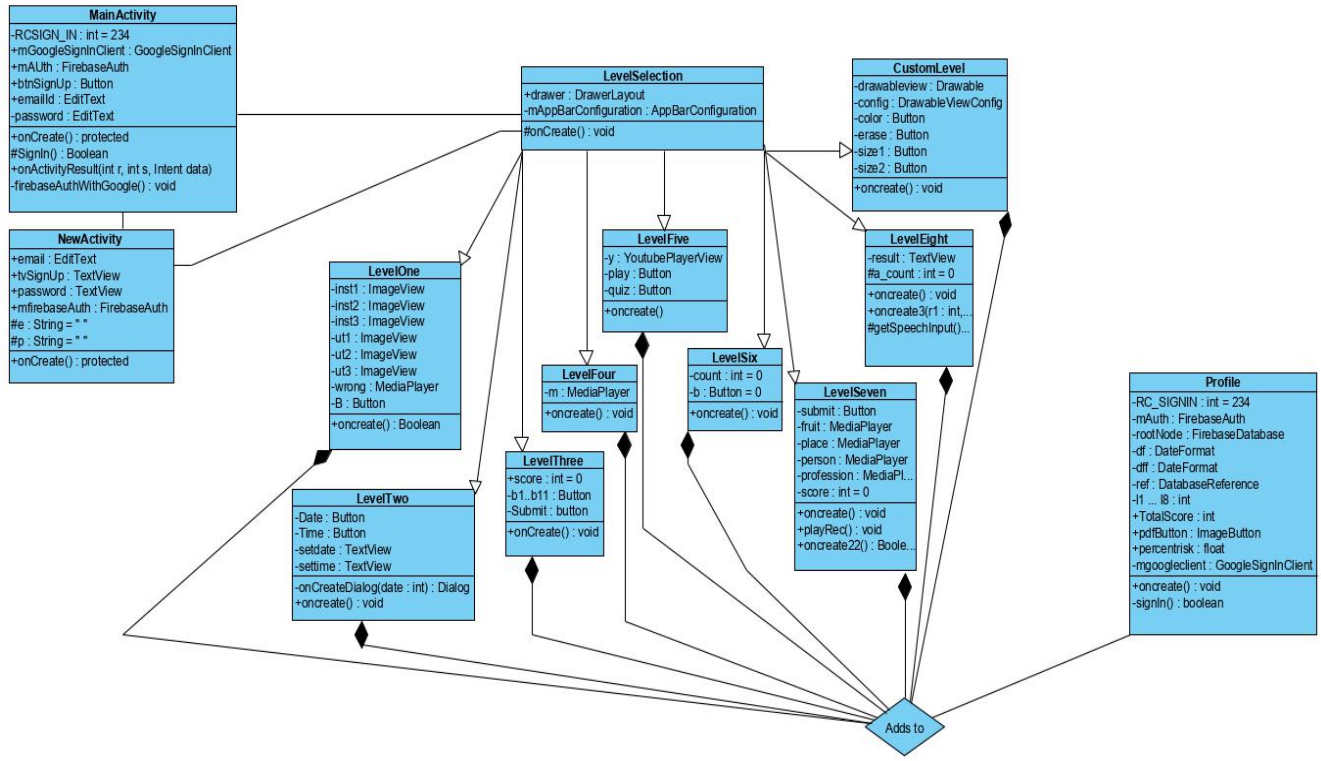


Figure 15 - Class diagram

F] State Machine Digram

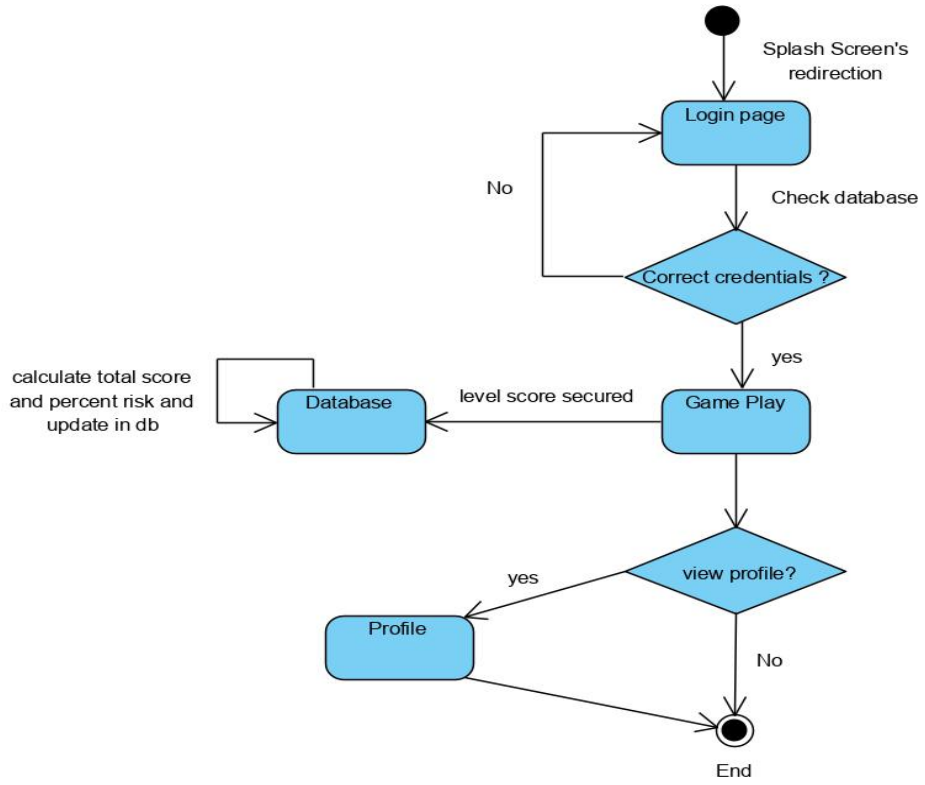


Figure 16 - State Machine diagram

G] Deployment Digram

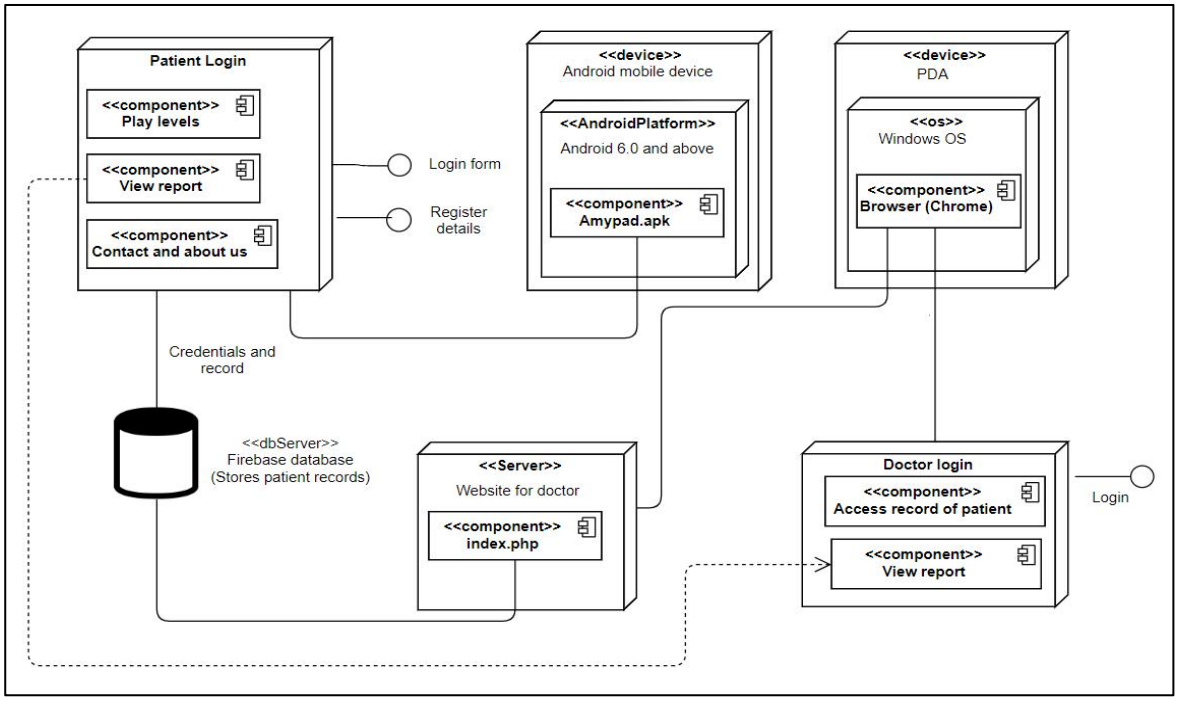


Figure 17 - Deployment Diagram

Chapter 5

Testing

Software testing can be stated as the process of verifying and validating that a software or application is bug free, meets the technical requirements as guided by it's design and development and meets the user requirements effectively and efficiently with handling all the exceptional and boundary cases.

5.1 Manual Testing

5.1.1 Sign-up page:

Test case priority:Medium		Test designed date : 27/04/2020			
Module name : Sign-up page		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 28/04/2020			
Precondition : Android OS and amypad.apk					
Test case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
SU_1	Open the Amypad App.	click the logo	App will be open	App is opened	Pass
SU_2	Check if the sign up screen GUI is correct	Open the Sign up Activity	Sign up Activity will be opened	Sign up Activity is opened	Pass
SU_3	Verify if a user will be able to sign up with a valid email and valid password.	Click on Email and Password field	Email and Password field should be focused	Email and Password field focused	Pass
SU_4	Verify if a user cannot login with a valid Email and an invalid password.	Click on Email and Password field	Invalid Email and Password	Sign up not successful	Pass
SU_5	Verify the Sign up page for both, when the field is blank and Sign up button is clicked.	Click on Sign up button	Please enter email ID	Please enter email ID	Pass

SU_6	Verify the Sign up page for Password, when the field is blank and Sign up button is clicked.	Enter email and Click on Sign up button	Please enter your Password	Please enter your password	Pass
SU_7	Verify the Sign up page for Email, when the Email field is blank and Sign up button is clicked.	Enter Password and Click on Sign up button	Please enter Email ID	Please enter Email ID	Pass
SU_8	Verify if the Sign in here link works	Click the sign in link	Sign in activity will be open	Sign in Activity is opened	Pass
SU_9	Verify if the Sign in here link works	Click the sign in link	Sign in activity will be open	Sign in Activity is not opened	Fail
SU_10	Verify if the google sign in option works	Click the button	Google Sign in screen will appear	Sign in screen is opened	Pass
SU_11	Verify if the google sign in option works	Click the button	Google Sign in screen will appear	Sign in failed	Fail
SU_12	Verify if the google sign in option works	Click the button	Select a google account to sign in	Select a google account to sign in	Pass
SU_13	Verify if the translate button works	Click the button	Select a Language	Select a Language	Pass
SU_14	Verify if the translate button works	Click the button	Select a Language	Nothing happens	Fail
SU_15	Verify if user is able to select Language	Select a Language	Language is selected	Language is selected	Pass
SU_16	Verify if user is able to select Language	Select a Language	Language is selected	Language is not selected	Fail
SU_17	Verify if the data in password field is visible as bullet signs.	Enter Password	Password will be visible in Bullets	Password is visible as bullets	Pass

SU_18	Verify if the font, text colour, and colour coding of the Sign up page is as per the standard.	Check the font, text colour and colour coding	Sign Up page UI is as per standard	Colors are not as per standard	Fail
SU_19	Verify if the font, text colour, and colour coding of the Sign up page is as per the standard.	Check the font, text colour and colour coding	Sign Up page UI is as per standard	Sign uppage UI is as per standard	Pass

Table 6 - Sign-up page test cases

5.1.2 Sign-in page:

Test case priority:Medium		Test designed date : 27/04/2020			
Module name : Sign-in page		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 28/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
SI_1	Check if the sign in screen GUI is correct	Open the Sign in Activity	Sign in Activity will be opened	Sign In Activity is opened	pass
SI_2	Verify if a user will be able to sign in with a valid email and valid password.	Click on Email and Password field	Email and Password field should be focused	Email and Password field focused	Pass
SI_3	Verify if a user cannot login with a valid Email and an invalid password.	Click on Email and Password field	Login failed please try again later	Login failed please try again later	Pass
SI_4	Verify the Sign in page for both, when the field is blank and Sign in button is clicked.	Click on Sign in button	Please enter email	Please enter email	Pass

SI_5	Verify the Sign in page for Password, when the field is blank and Sign in button is clicked.	Enter email and Click on Sign in button	Please enter your Password	Please enter your password	Pass
SI_6	Verify the Sign in page for Email, when the Email field is blank and Sign in button is clicked.	Enter Password and Click on Sign in button	Please enter Email ID	Please enter Email ID	Pass
SI_7	Verify if the Sign up here link works	Click the sign up link	Sign up activity will be open	Sign up Activity is opened	Pass
SI_8	Verify if the Sign up here link works	Click the sign up link	Sign up activity will be open	Sign up Activity is opened	Pass
SI_9	Verify if the data in password field is visible as bullet signs.	Enter Password	Password will be visible in Bullets	Password is visible as bullets	Pass
SI_10	Verify if the font, text colour, and colour coding of the Sign in page is as per the standard.	Check the font, text colour and colour coding	Sign In page UI is as per standard	Colors are not as per standard	Fail
SI-11	Verify if the font, text colour, and colour coding of the Sign in page is as per the standard.	Check the font, text colour and colour coding	Sign Up page UI is as per standard	Sign in page UI is as per standard	Pass

Table 7 - Sign-in page test cases

5.1.3 Entry screen and levels:

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 1		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
1.1	Verify if the Home screen GUI is Standard	Sign in the app	Home Screen will be with standard GUI	Home screen is with Standard GUI	Pass
1.2	Verify GUI for Level 1	Open Level 1	GUI is standard	GUI is standard	Pass
1.3	Verify if you can drag objects in buckets	Drag object in bucket	Object will be dragged to bucket	Object is dragged to bucket	Pass
1.4	Verify if multiple objects can be dragged simultaneously	try to drag multiple objects	Only one object can be dragged at a time	Only one object is dragged	Pass
1.5	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
1.6	Verify if the Home Button works	click the home button	Home page will open	Home page is not opened	Fail
1.7	Verify if there is any background sound	Raise the volume	There will be no Background sound in level 1	There is no background sound	Pass
1.8	verify app by dragging object in wrong bucket	Drag object to wrong bucket	There will be a sound indicating wrong bucket	There is a sound indicating object is dragged to wrong bucket	Pass
1.9	verify app by dragging object to correct bucket	Drag object to correct bucket	There will be no sound	There is no sound	Pass
1.11	verify if submit button works properly	Click the button	Score Toast message will appear	Score Toast message appears	Pass

Table 8 -level 1 test cases

Test case priority:High	Test designed date : 29/04/2020
Module name : Level 2	Test Executed by : 1706080
Test title: AMYPAD	Test Execution date : 30/04/2020
Precondition : Android OS and amypad.apk	

Test	Test Case	Steps	Expected Result	Actual Result	Status
2.1	Verify if the level 2 button works	Click button for level 2	Stage 2 activity will start	Stage 2 activity is started	Pass
2.2	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
2.3	Verify if the forward arrow Button works	click the forward arrow button	next stage will open	next stage is opened	Pass
2.4	Verify if select date button works	click the Select date button	Date picker will be visible	Date picker is visible	Pass
2.5	Verify if select date button works	click the Select date button	Date picker will be visible	Date picker is not visible	Fail
2.6	Verify if select time button works	click the Select Time button	Time picker will be visible	Time picker is visible	Pass
2.7	Verify if select Time button works	click the Select Time button	Time picker will be visible	Time picker is not visible	Fail
2.8	Verify the module by selecting right date	Select the right date	Correct date message will appear	Correct date message is visible	Pass
2.9	Verify the module by selecting wrong date	Select the wrong date	Wrong date message will appear	Wrong date message is visible	Pass
2.11	Verify the module by selecting right Time	Select the right Time	Correct Time message will appear	Correct Time message is visible	Pass
2.12	Verify the module by selecting wrong Time	Select the wrong Time	Wrong Time message will appear	Wrong Time message is visible	Pass

2.13	Verify if the check button works properly	Click the check button	Score will be visible	Score is visible	Pass
2.14	Verify module by selecting wrong date and right time	Select wrong date,right time and click check button	Score will be 1	Score is 1	Pass

Table 9 -level 2 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 3		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
3.1	Verify if the level 3 button works	Click button for level 3	Stage 3 activity will start	Stage 3 activity is started	Pass
3.2	Verify if Stage 3 UI is standard	Start Stage 3 Activity	UI is as per standard	UI is as per Standards	Pass
3.3	Verify if All 11 buttons are visible	Start Stage 3 Activity	Buttons should be visible	Buttons are visible	Pass
3.4	Verify if All 11 buttons are clickable	click the button one by one	Buttons should be Clickable	Buttons are Clickable	Pass
3.5	Verify if the sound is generated after clicking buttons	Click the button and ensure Volume is turned on	Buttons will generate sound	Sound is generated when button is clicked	Pass
3.6	Verify if the button is generating right sound according to right or wrong selections	Click the button	Buttons will generate right sound	Buttons are generating right sound	Pass
3.7	Verify if the button is generating right sound according to right or wrong selections	Click the button	Buttons will generate right sound	Buttons are not generating right sound	Fail

3.8	Verify if Click here when done button works properly	Click the click here when done button	Score message will be visible	Score message is generated	Pass

Table 10 - level 3 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 4		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
4.1	Verify if the level 4 button works	Click button for level 4	Stage 4 activity will start	Stage 4 activity is started	Pass
4.2	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
4.3	Verify if the forward arrow Button works	click the forward arrow button	next stage will open	next stage is opened	Pass
4.4	Verify if number to remember is readable	Read the number	Number will be readable	Number is readble	Pass
4.5	Verify if after some seconds next activity is opened	Open stage 4 and wait for some seconds	Other activity will be visible	Other activity is visible	Pass
4.6	Verify if enter the the number you remember field works	Click on Field to be focused and enter a number	Number you typed will be visible	Number is Visible	Pass
4.7	Verify if Submit Button works	Click the submit button	Toast saying wrong or right number will be visible	Toast Message is visible	Pass
4.8	Verify what happens when no Number is entered and submit button is clicked	click the submit button	OOPS! Wrong number	OOPS! Wrong number	Pass

4.9	Verify if a sound is generated when stage 4 is started	Open stage 4 activity	Sound is generated	Sound is generated	Pass

Table 11 - level 4 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 5		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
5.1	Verify if the level 5 button works	Click button for level 5	Stage 5 activity will start	Stage 5 activity is started	Pass
5.2	Verify if the Play button works	Click the Play button	Play will Start	Play is started	Pass
5.3	Verify if user can enlarge youtube play screen	Click the button	Screen will be enlarged	Screen is enlarged	Pass
5.4	Verify if the Play button works	Click the Play button	Play will Start	Play is not started	Fail
5.5	Verify if the quiz button works	Click the quiz button	Quiz will start	Quiz is started	Pass
5.6	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
5.7	Verify if the forward arrow Button works	click the forward arrow	next stage will open	next stage is opened	Pass
5.8	Verify if all the 5 questions and options are readable	_	Questions and options will be readable	Questions and options are readable	Pass
5.9	Verify if user can select multiple options at a time	Select more than one option	Only one option can be selected at a time	Only one option can be selected at a time	Pass
5.11	Verify if the Submit	Click Submit	Toast message	Toast message is	Pass

	button works properly	button	will appear	appeared	
5.12	Verify if a sound is generated when stage 5 quiz is started	Open stage 5 activity	Sound will be generated	Sound is generated	Pass

Table 12- level 5 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 6		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
6.1	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
6.2	Verify if the forward arrow Button works	click the forward arrow button	next stage will open	next stage is opened	Pass
6.3	Verify UI of stage 6 is as per standard or not	Open stage 6 activity	UI is as per standard	UI is as per standard	Pass
6.4	Verify if all the 5 Images and options are visible and readable	_	Images and options will be readable and visible	images and options are visible	Pass
6.5	Verify if user can select multiple options at a time	Select more than one option	Only one option can be selected at a time	Only one option can be selected at a time	Pass
6.7	Verify if the Submit button works properly	Click Submit button	Toast message will appear	Toast message is appeared	Pass
6.8	Verify if after submitting answers are highlighted in green color or not	select options and click submit	answers will be highlighted in green	answers are highlighted in green color	Pass

Table 13 - level 6 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 7		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
7.1	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
7.2	Verify if all Sounds are audible without any unwanted noise	Click the audio buttons	Audio will be audible without any noise	Audio is audible without any noise	Pass
7.3	Verify if option images are visible	Click the image buttons	Image buttons are visible	Image buttons are visible	Pass
7.4	Verify if the Submit button works properly	Click Submit button	Toast message will appear	Toast message is appeared	Pass
7.5	Verify if stage 7 UI is as per requirement	Open stage 7 activity	UI is as per requirement	UI is as per requirement	Pass

Table 14 - level 7 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Level 8		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
8.1	Verify if the Home Button works	click the home button	Home page will open	Home page is opened	Pass
8.2	Verify if the forward arrow Button works	click the forward arrow button	next stage will open	next stage is opened	Pass
8.3	Verify if stage 8 UI is as per requirement	Open stage 8 activity	UI is as per requirement	UI is as per requirement	Pass

8.4	Verify if google mike button records audio or not	Click on the mike symbol	Records audio	Records auddio	Pass
8.5	Verify if the count of words is correct or not	Click on the mike symbol	Count will be correct	Count is correct	Pass

Table 15 - level 8 test cases

Test case priority:High		Test designed date : 29/04/2020			
Module name : Custom Level		Test Executed by : 1706080			
Test title: AMYPAD		Test Execution date : 30/04/2020			
Precondition : Android OS and amypad.apk					
Test Case	**Test Case Objective**	**Steps**	**Expected Result**	**Actual Result**	**Status**
C_1	Verify if the color button works properly	Click the color button	Color of brush will be changed	Color of brush is changed to a random color	Pass
C_2	Verify if the + button works	Click the + button	font size will be increased by 10	Font size is changed	Pass
C_3	Verify if the - button works	click the - button	Font size will be increased by 10	Font size is decreased by 10	Pass
C_4	Verify if the CLS button works	Click the CLS button	Screen will be cleared	Screen is cleared	Pass
C_5	Verify if the canvas borders are visible	_	Canvas borders are visible	Canvas Borders are visible	Pass

Table 16 - Custom level test cases

Chapter 6

User Manual

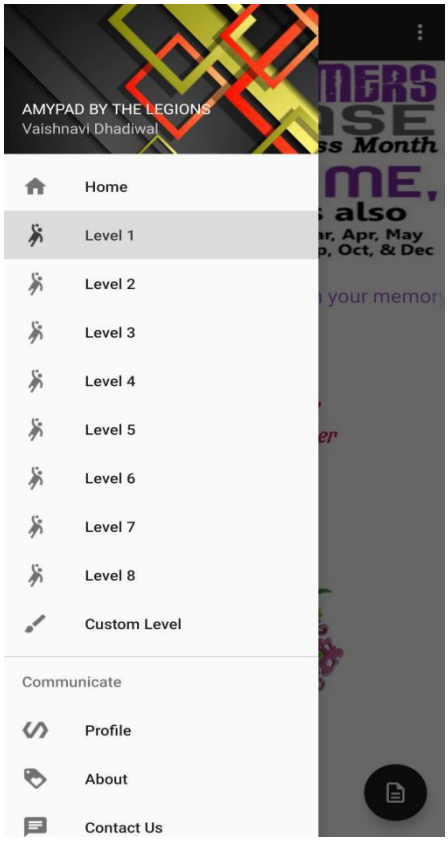
Here we provide the screen shots of the app.

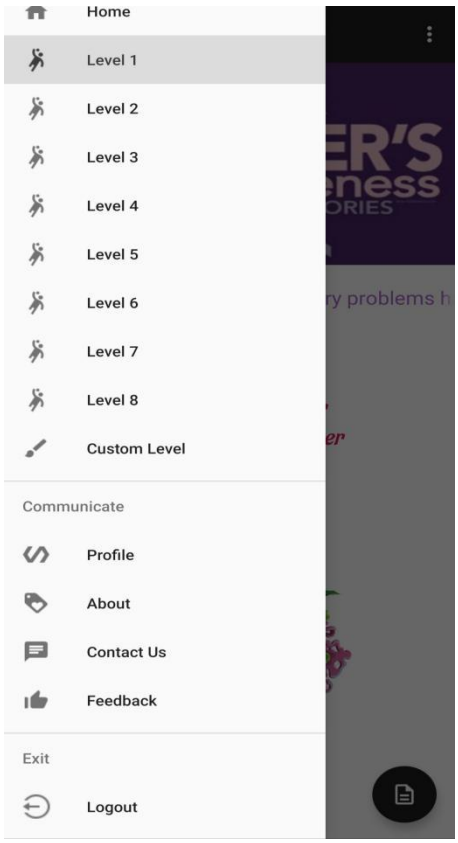
AMYPAD / WITH ♥ BY LEGIONS

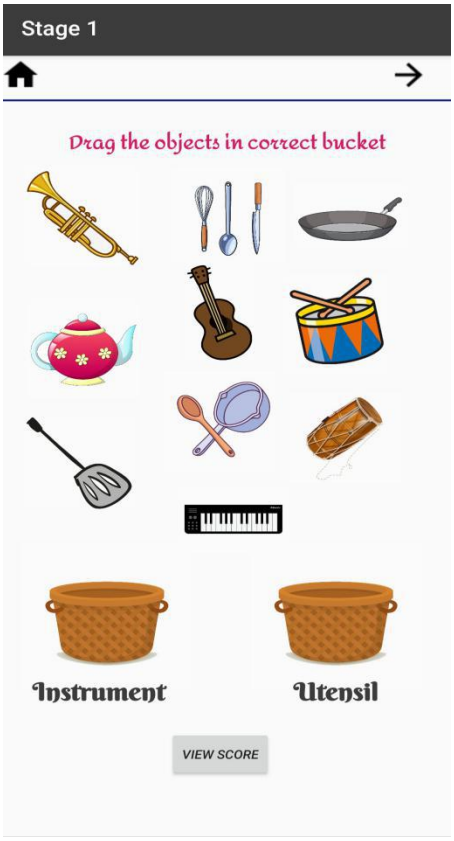

Sign Up
Select language
English
Español
Français
Hindi
ईमेल
प्रासवर्ड
साइन अप करें
क्या आपके पास खाता मौजूद है?साइन इन करो
Sign In


Sign Up
Select language
एमीपैड
द लीजन द्वारा पहल
ईमेल
प्रासवर्ड
साइन अप करें
क्या आपके पास खाता मौजूद है?साइन इन करो
Sign In

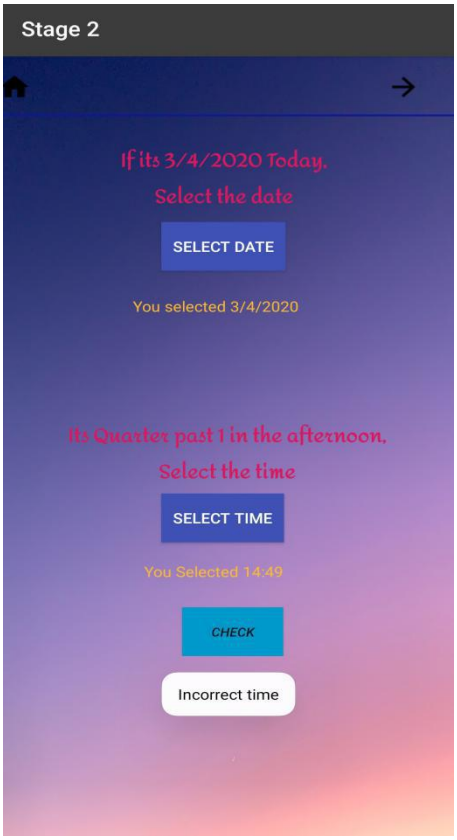

AMYPAD creations
We don't know how STRONG WE ARE until being strong is the ONLY CHOICE WE HAVE.
Alzheimer's Disease Awareness
We are your friends,here to help you out throu
"We remember their love when they no longer remember us!"
PLAY
User Signed In as Vaishnavi Dhadiwal

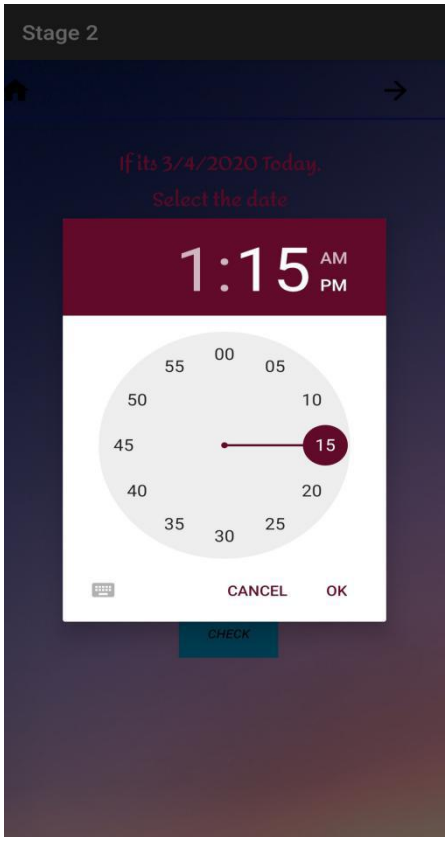

AMYPAD BY THE LEGIONS
Vaishnavi Dhadiwal
Home
Level 1
Level 2
Level 3
Level 4
Level 5
Level 6
Level 7
Level 8
Custom Level
Communicate
Profile
About
Contact Us

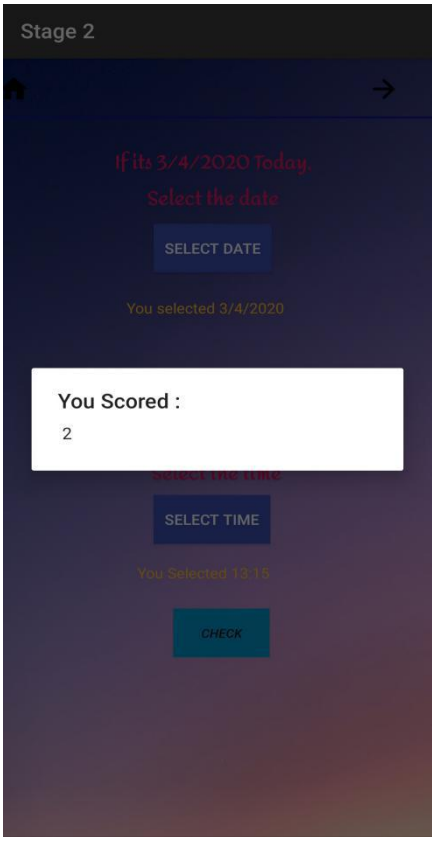

Home
Level 1
Level 2
Level 3
Level 4
Level 5
Level 6
Level 7
Level 8
Custom Level
Communicate
Profile
About
Contact Us
Feedback
Exit
Logout

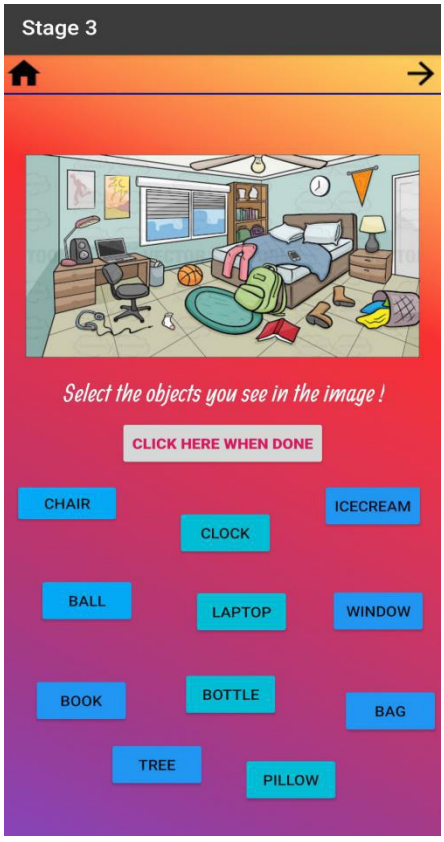

Stage 1
Drag the objects in correct bucket
Instrument
Utensil
VIEW SCORE

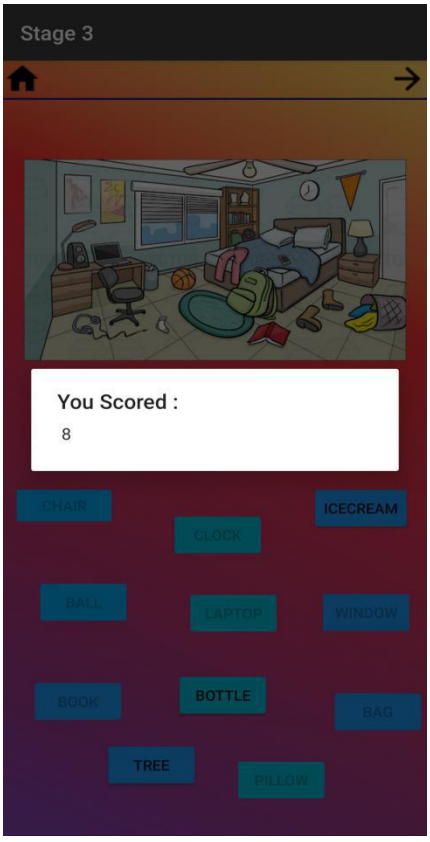

Stage 1
Drag the objects in correct bucket
Instrument
Score is 10
Utensil
VIEW SCORE

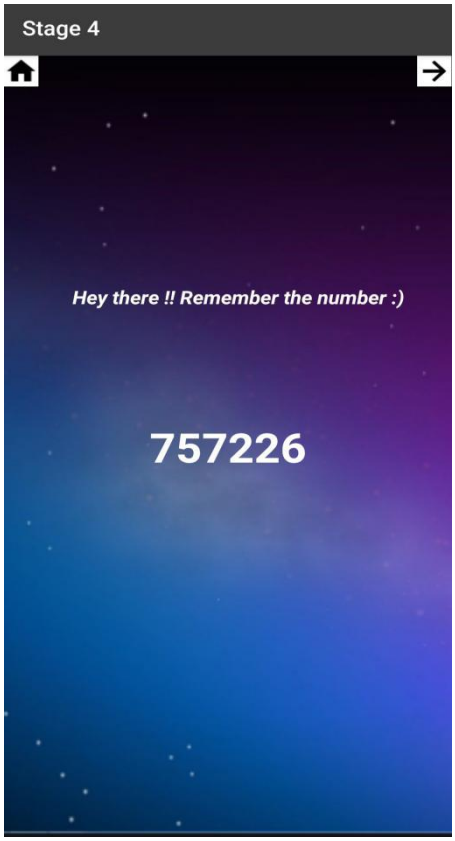

Stage 2
If its 3/4/2020 Today,
Select the date
SELECT DATE
You selected 3/4/2020
Its Quarter past 1 in the afternoon,
Select the time
SELECT TIME
You Selected 14:49
CHECK
Incorrect time

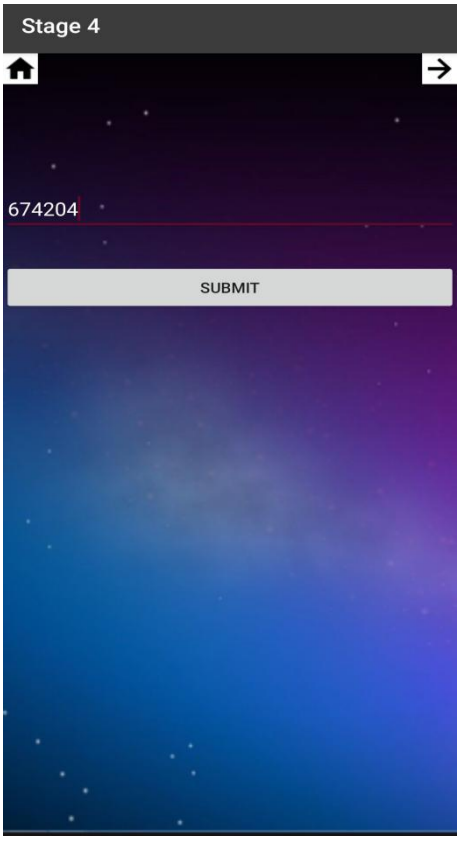

Stage 2
If its 3/4/2020 Today,
Select the date
1:15
AM
PM
00
05
10
15
20
25
30
35
40
45
50
55
CANCEL
OK
CHECK

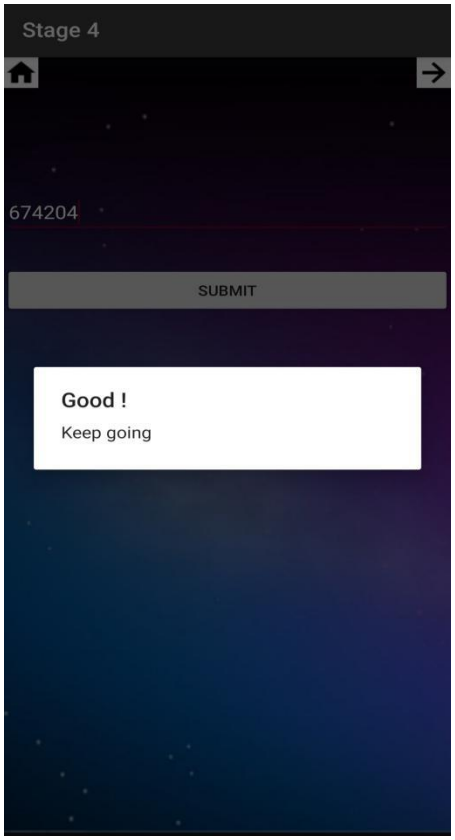

Stage 2
If its 3/4/2020 Today,
Select the date
SELECT DATE
You selected 3/4/2020
You Scored :
2
SELECT TIME
You Selected 13:15
CHECK

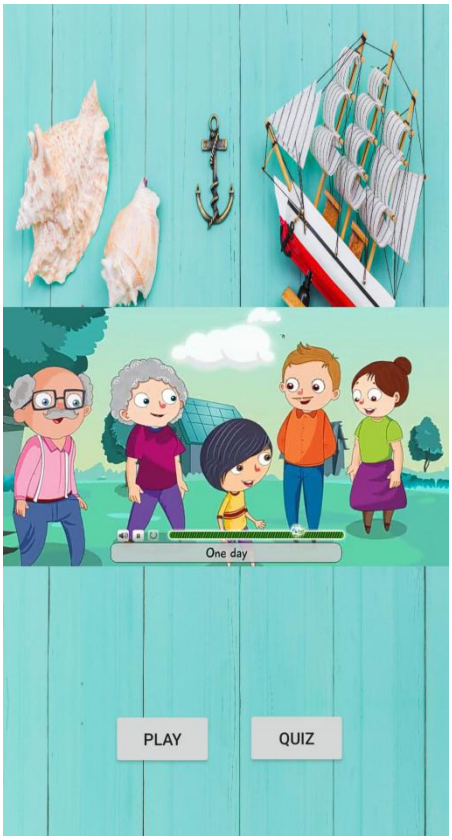

Stage 3
Select the objects you see in the image !
CLICK HERE WHEN DONE
CHAIR
ICECREAM
CLOCK
BALL
LAPTOP
WINDOW
BOOK
BOTTLE
BAG
TREE
PILLOW

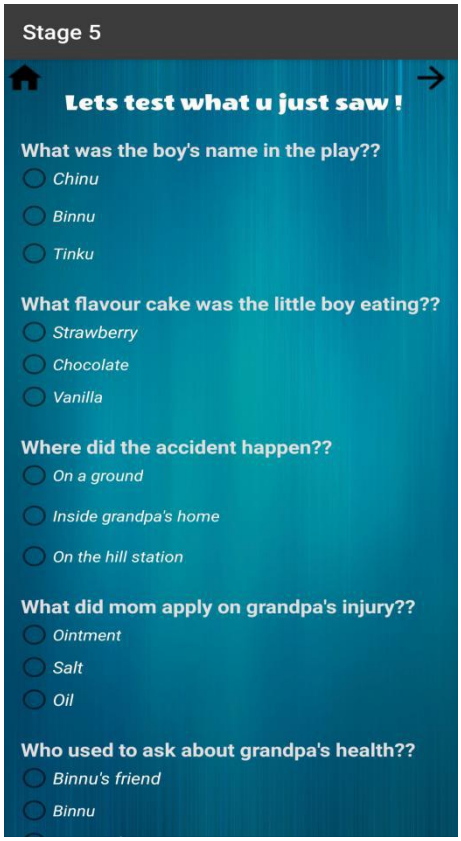

Stage 3
You Scored :
8
CHAIR
ICECREAM
CLOCK
BALL
LAPTOP
WINDOW
BOOK
BOTTLE
BAG
TREE
PILLOW

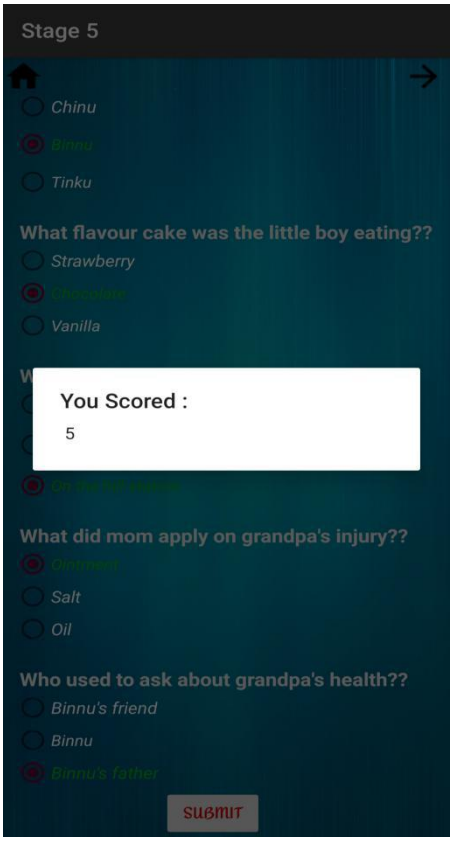

Stage 4
Hey there !! Remember the number :)
757226

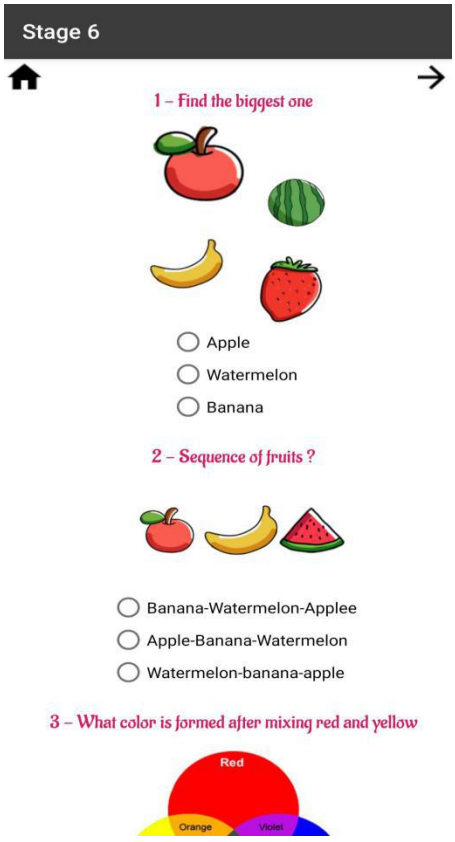

Stage 4
674204
SUBMIT

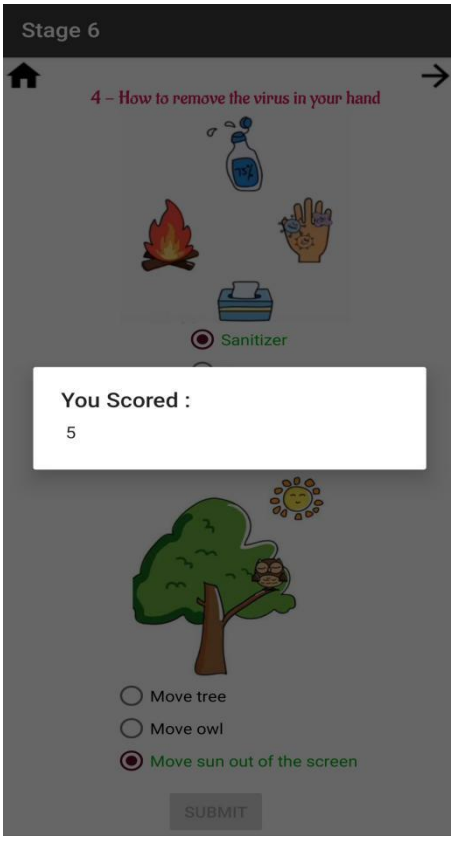

Stage 4
674204
SUBMIT
Good !
Keep going

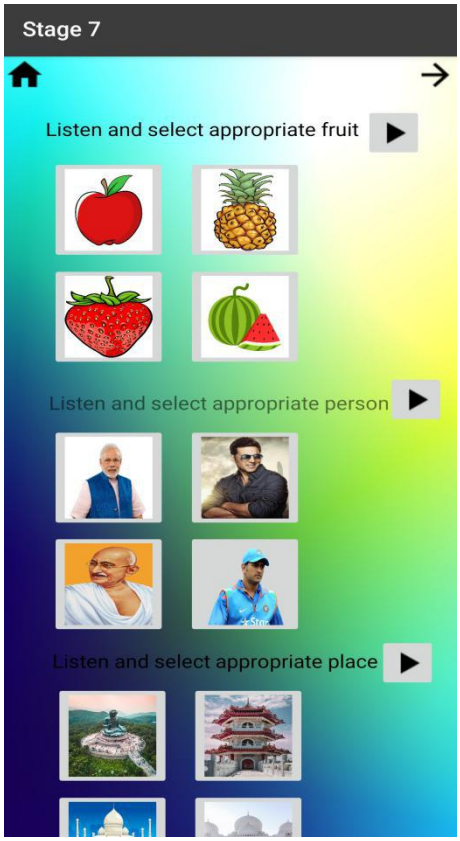

One day
PLAY
QUIZ

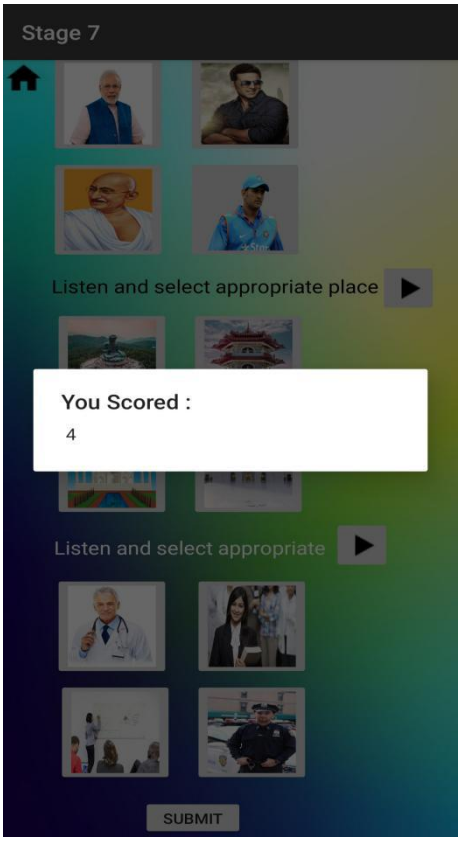

Stage 5
Lets test what u just saw !
What was the boy's name in the play??
Chinu
Binnu
Tinku
What flavour cake was the little boy eating??
Strawberry
Chocolate
Vanilla
Where did the accident happen??
On a ground
Inside grandpa's home
On the hill station
What did mom apply on grandpa's injury??
Ointment
Salt
Oil
Who used to ask about grandpa's health??
Binnu's friend
Binnu

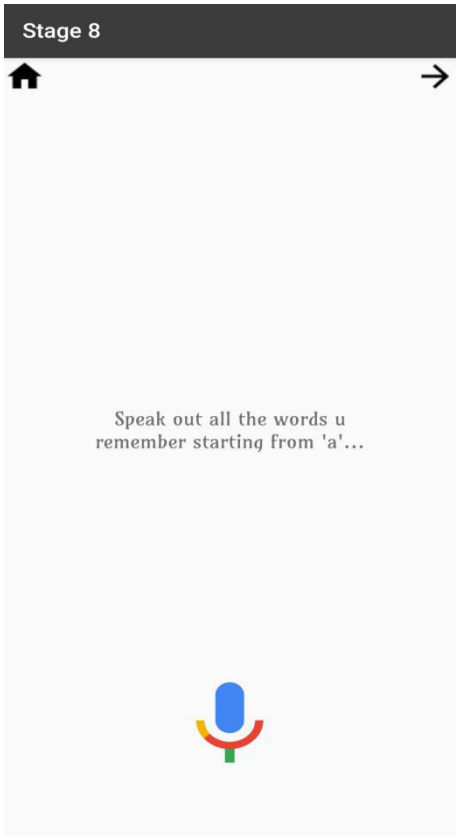

Stage 5
Chinu
Binnu
Tinku
What flavour cake was the little boy eating??
Strawberry
Vanilla
You Scored :
5
What did mom apply on grandpa's injury??
Salt
Oil
Who used to ask about grandpa's health??
Binnu's friend
Binnu
SUBMIT

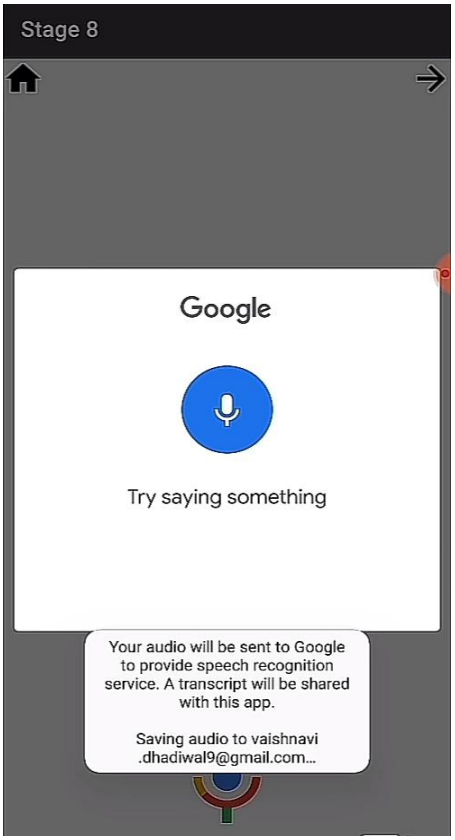

Stage 6
1 – Find the biggest one
Apple
Watermelon
Banana
2 – Sequence of fruits ?
Banana-Watermelon-Applee
Apple-Banana-Watermelon
Watermelon-banana-apple
3 – What color is formed after mixing red and yellow
Red
Orange
Violet

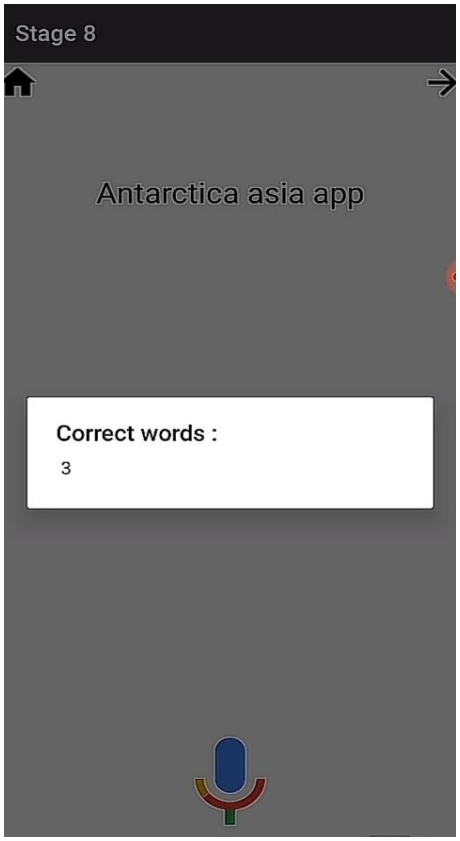

Stage 6
4 – How to remove the virus in your hand
Sanitizer
You Scored :
5
Move tree
Move owl
Move sun out of the screen
SUBMIT

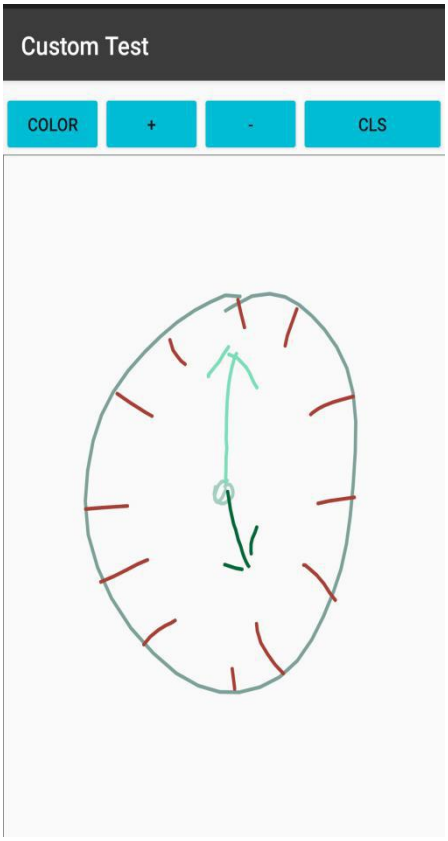

Stage 7
Listen and select appropriate fruit
Listen and select appropriate person
Listen and select appropriate place

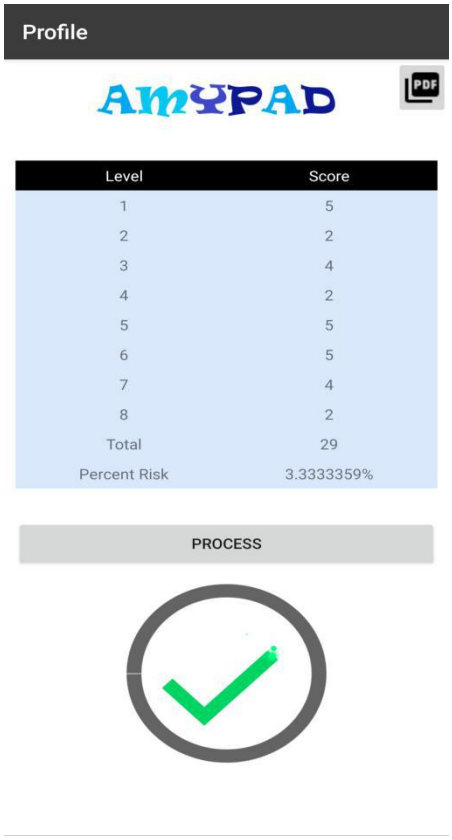

Stage 7
Listen and select appropriate place
You Scored :
4
Listen and select appropriate
SUBMIT

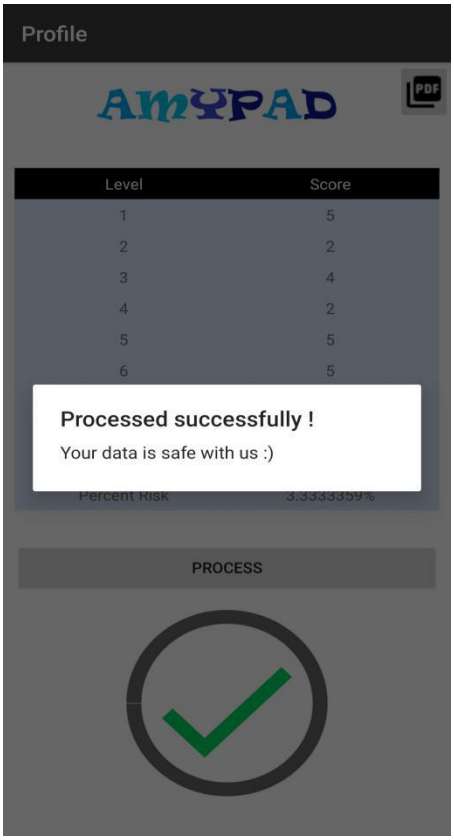

Stage 8
Speak out all the words u remember starting from 'a'...

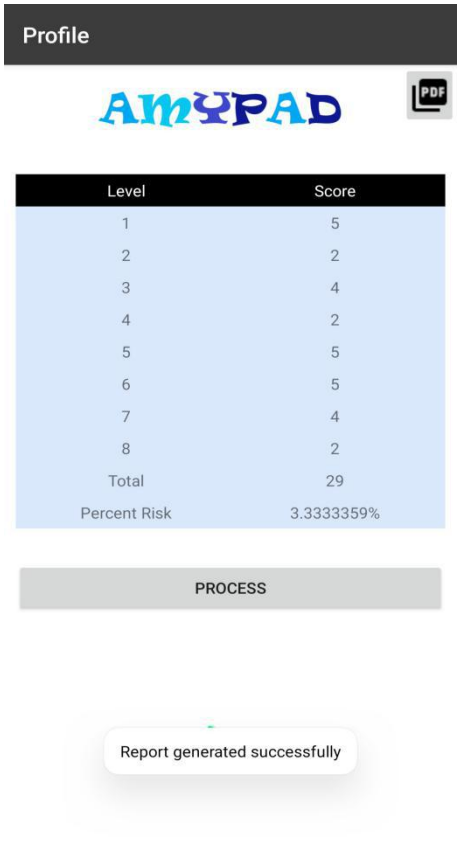

Stage 8
Google
Try saying something
Your audio will be sent to Google to provide speech recognition service. A transcript will be shared with this app.
Saving audio to vaishnavi .dhadiwal9@gmail.com...

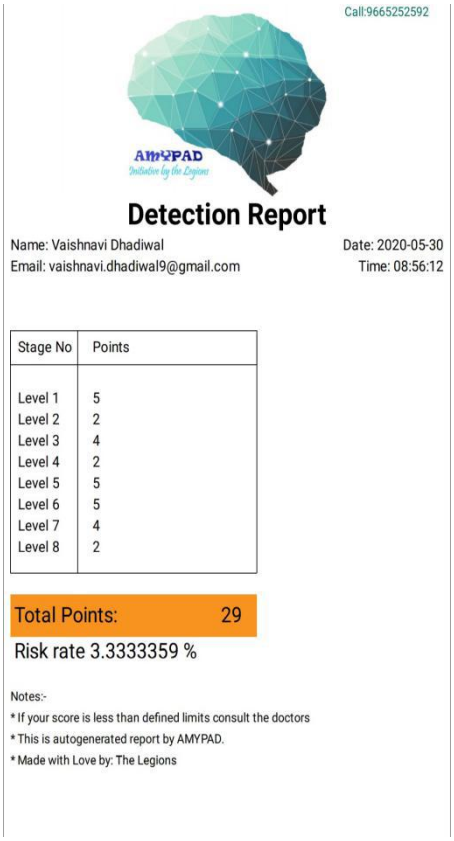

Stage 8
Antarctica asia app
Correct words :
3

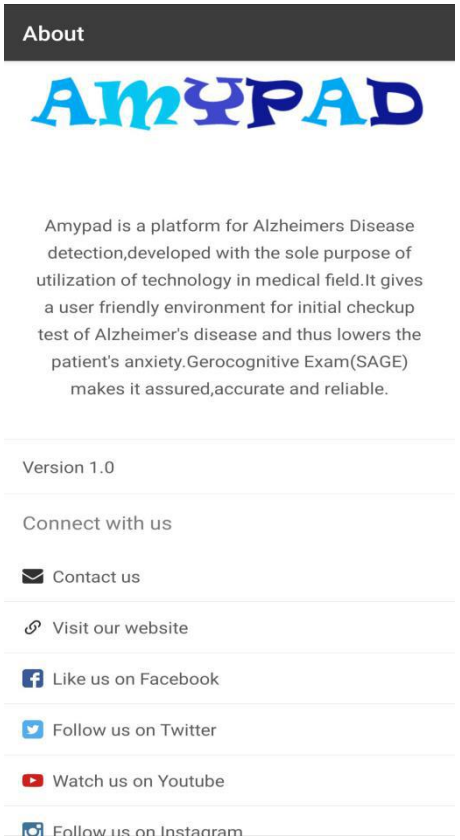

Custom Test
COLOR
+
-
CLS

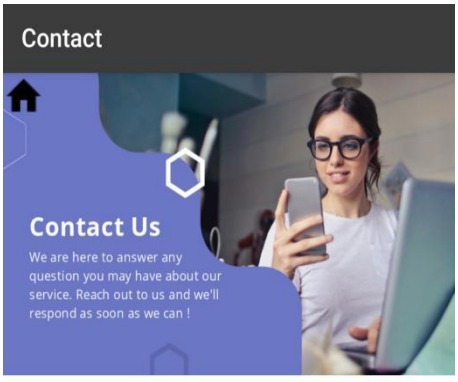

Profile
AMYPAD
Level
Score
1
5
2
2
3
4
4
2
5
5
6
5
7
4
8
2
Total
29
Percent Risk
3.3333359%
PROCESS


Profile
AMYPAD
Level
Score
1
5
2
2
3
4
4
2
5
5
6
5
Processed successfully !
Your data is safe with us :)
PROCESS

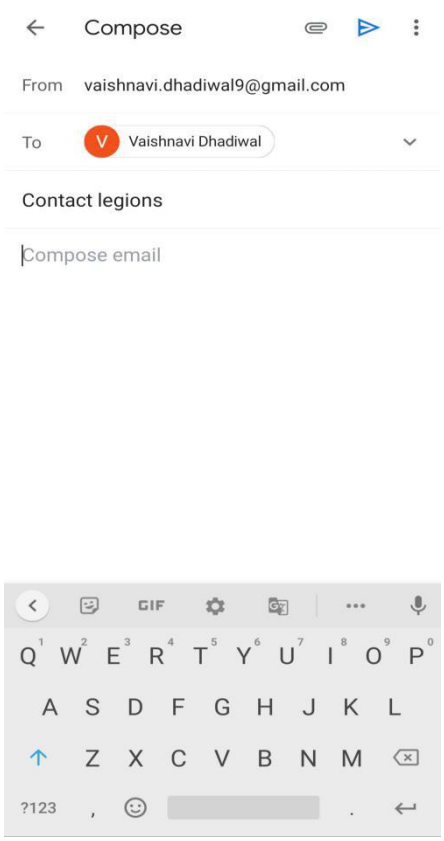


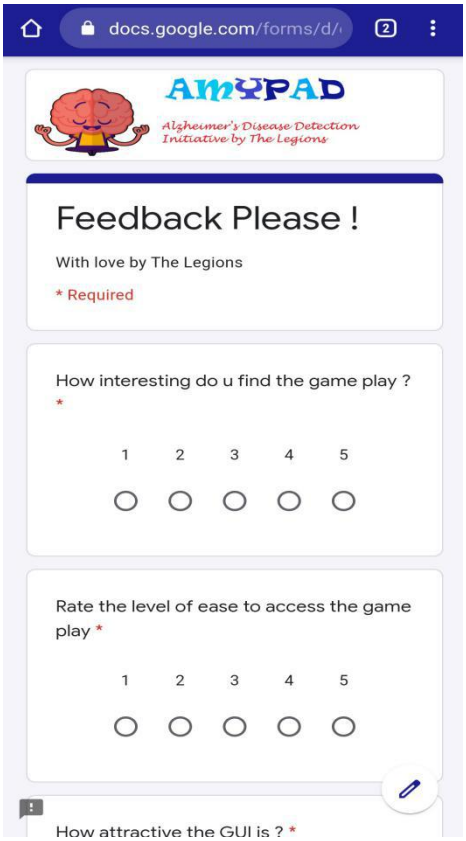


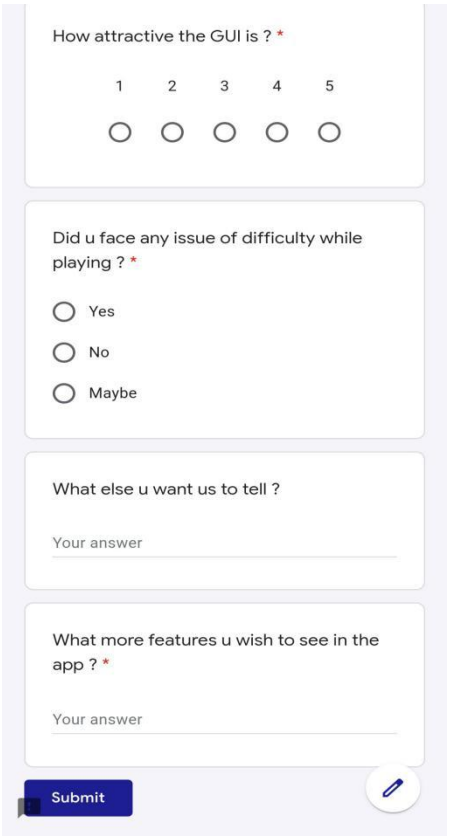




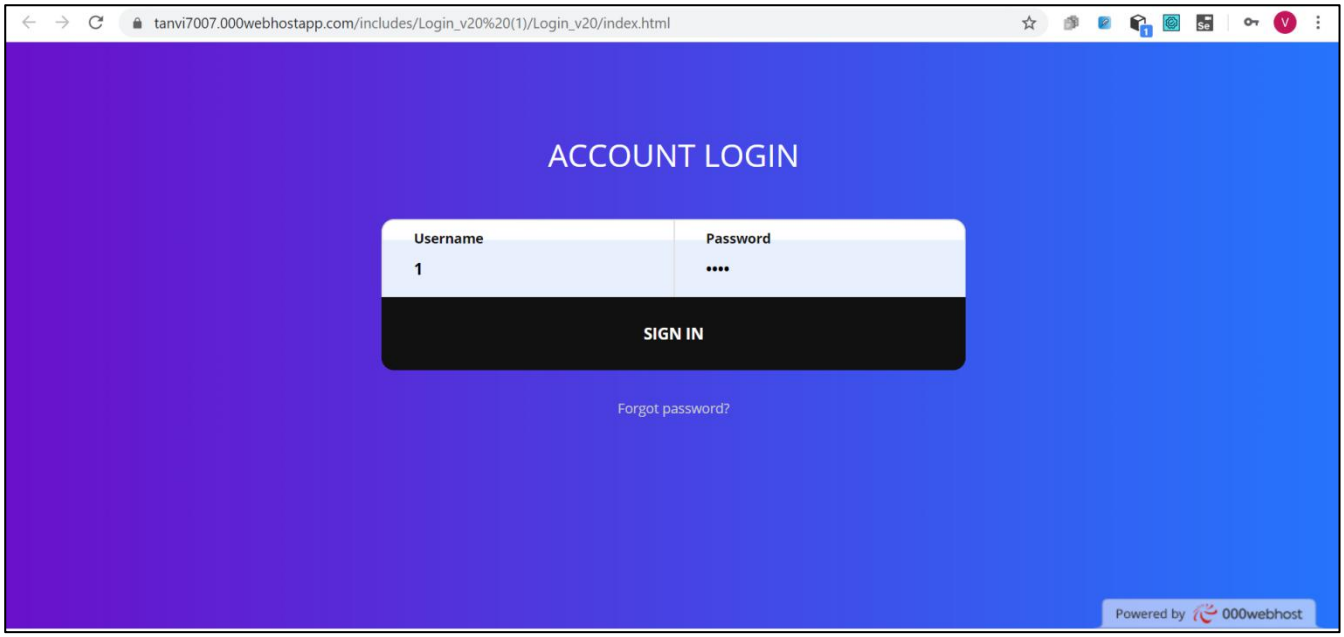
Us	Email
Vaishnavi S. Dhadiwal 1706020	vaishnavi.dhadiwal9@gmail.com
Tanvi D. Katakkar 1706049	t.katakkar9@gmail.com
Sakshi M. Memane 1706074	sakshimemane2001@gmail.com
Shruti D. Naphade 1706080	shrutinaphade027@gmail.com

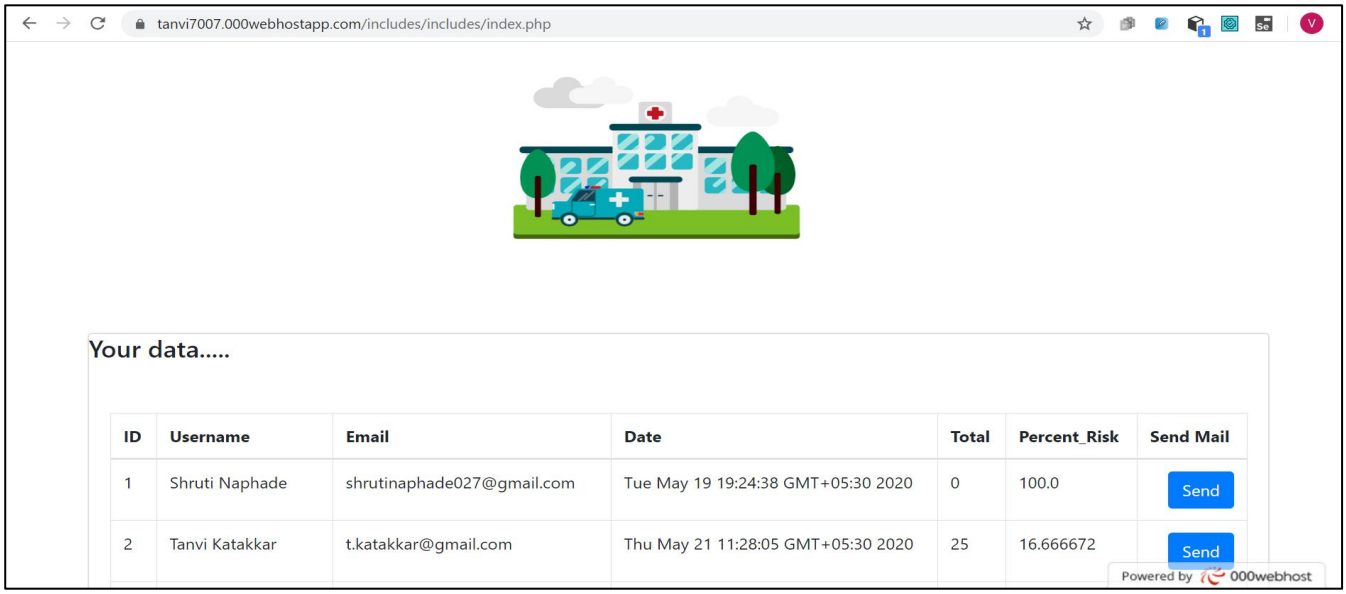

Compose
From vaishnavi.dhadiwal9@gmail.com
To Vaishnavi Dhadiwal
Contact legions
Compose email


docs.google.com/forms/d/
AMYPAD
Alzheimer's Disease Detection Initiative by The Legions
Feedback Please !
With love by The Legions
* Required
How interesting do u find the game play ? *
1 2 3 4 5
Rate the level of ease to access the game play *
1 2 3 4 5
How attractive the GUI is ? *


How attractive the GUI is ? *
1 2 3 4 5
Did u face any issue of difficulty while playing ? *
Yes
No
Maybe
What else u want us to tell ?
Your answer
What more features u wish to see in the app ? *
Your answer
Submit

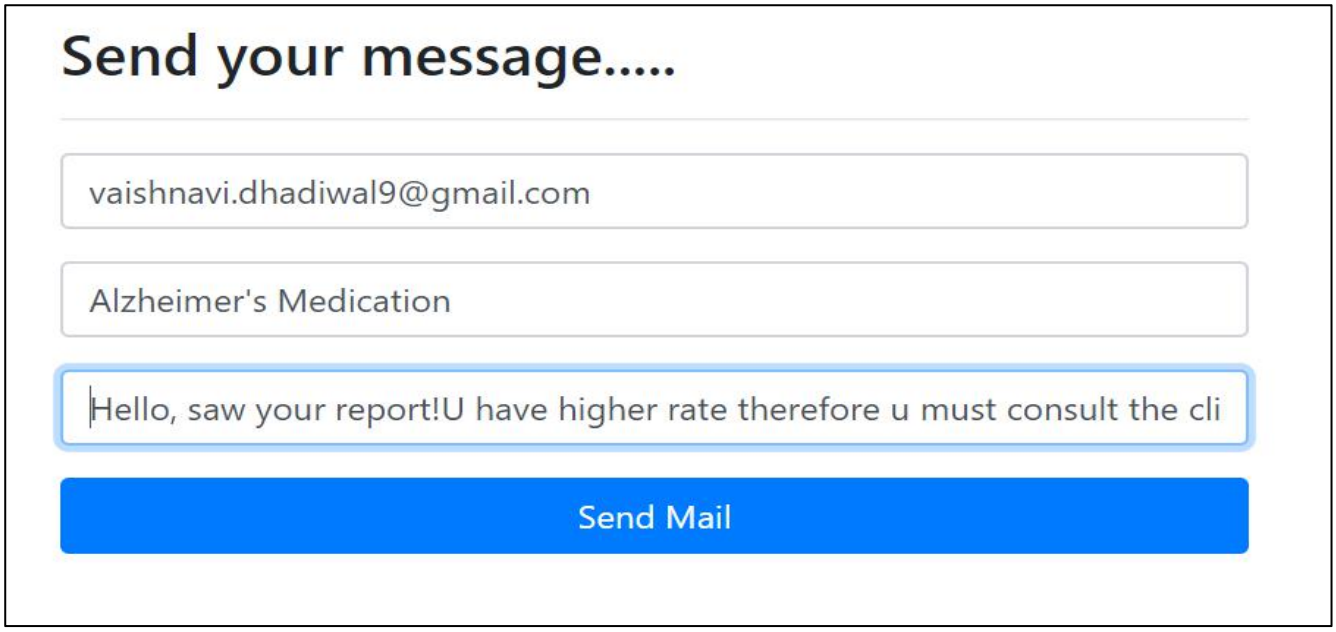

Sign Up
Select language
AMYPAD
Initiative by The Legions
Email
Password
SIGN UP
Already have an account? Sign in here
Sign In
Logout Successfull!

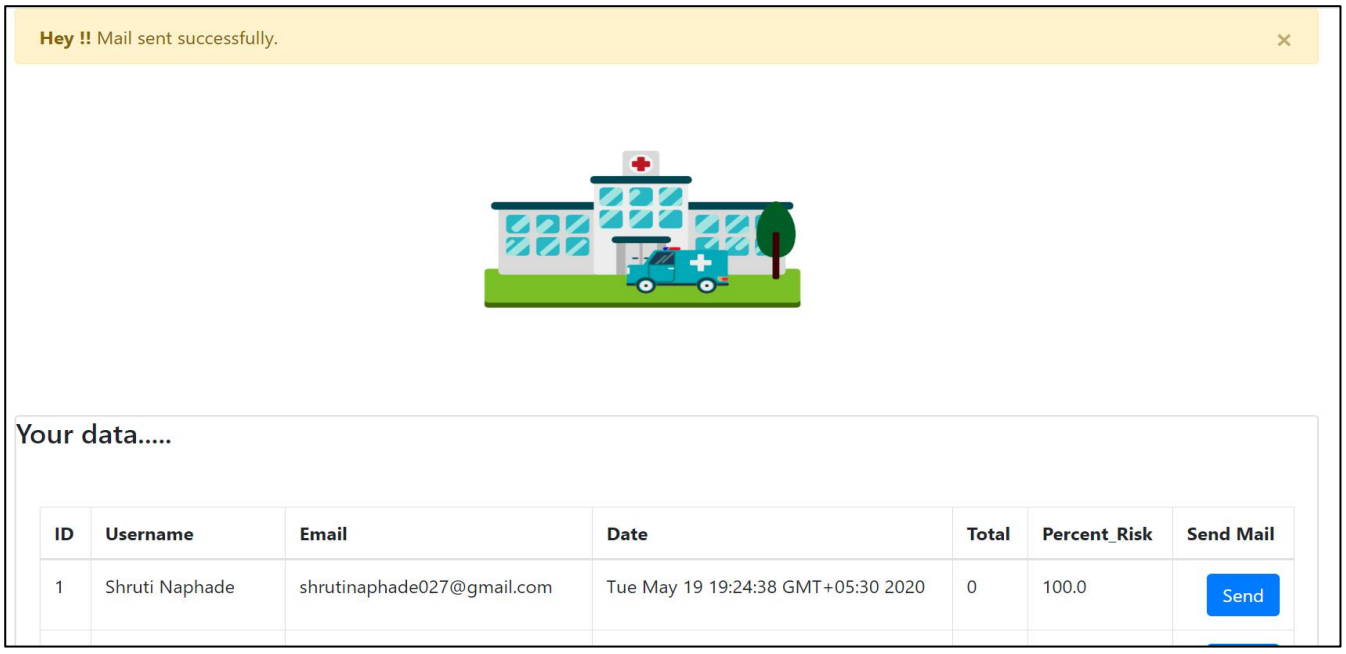


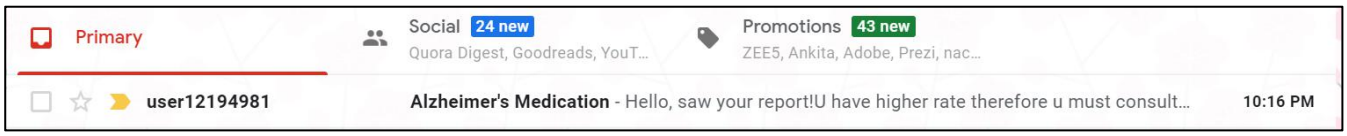


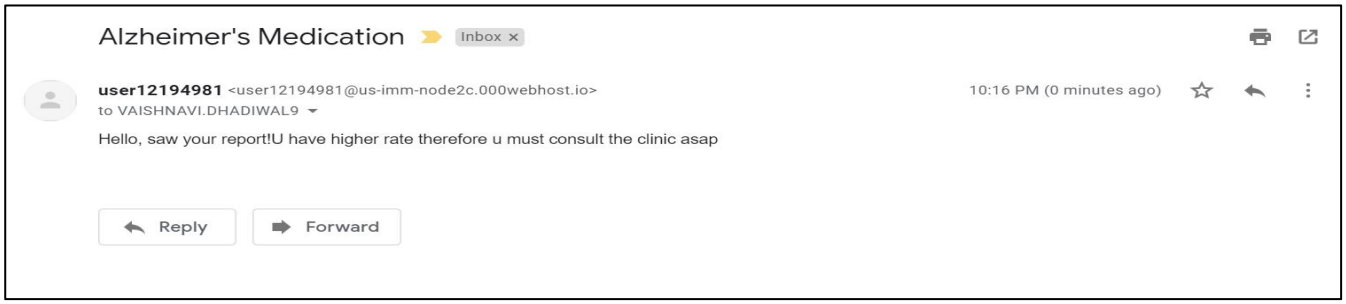
Your data.....

ID	Username	Email	Date	Total	Percent_Risk	Send Mail
1	Shruti Naphade	shrutinaphade027@gmail.com	Tue May 19 19:24:38 GMT+05:30 2020	0	100.0	Send
2	Tanvi Katakkar	t.katakkar@gmail.com	Thu May 21 11:28:05 GMT+05:30 2020	25	16.666672	Send
3	Vaishnavi Dhadiwal	vaishnavi.dhadiwal9@gmail.com	Sat May 30 20:56:05 GMT+05:30 2020	29	3.3333359	Send
4	a	a@b.com	Thu May 14 12:00:34 GMT+05:30 2020	29	58.0	Send
5	hajahh	hajahh@gnz.com	Sun May 17 20:43:54 GMT+05:30 2020	8	73.33333	Send


Send your message.....
vaishnavi.dhadiwal9@gmail.com
Alzheimer's Medication
Hello, saw your report!U have higher rate therefore u must consult the cli
Send Mail


Hey !! Mail sent successfully.
Your data.....
ID
Username
Email
Date
Total
Percent_Risk
Send Mail
1
Shruti Naphade
shrutinaphade027@gmail.com
Tue May 19 19:24:38 GMT+05:30 2020
0
100.0
Send


Primary
Social 24 new
Quora Digest, Goodreads, YouT...
Promotions 43 new
ZEE5, Ankita, Adobe, Prezi, nac...
user12194981
Alzheimer's Medication - Hello, saw your report!U have higher rate therefore u must consult...
10:16 PM


Alzheimer's Medication
Inbox ×
user12194981 <user12194981@us-imm-node2c.000webhost.io>
to VAISHNAVI.DHADIWAL9
10:16 PM (0 minutes ago)
Hello, saw your report!U have higher rate therefore u must consult the clinic asap
Reply
Forward

Chapter 7

Strengths and Limitations

7.1 Strengths :

1. The work has been automated with this system.
2. This system provides native language support thus facilating every common man to play ih his/her own mother-tongue.
3. It is able to detect Alzheimer's disease at very early stage.
4. Patient and Doctor got an mobile platform to interact.
5. This Application saves a lot of time and offline work.
6. Promotes digital india.
7. Easy to use and understand.
8. Application generates certificates which gives risk of alzhiemer's disease .
9. Application does not need any kind of administration.
10. As every record is stored in database doctor can examine patient whenever and wherever needed.

7.2 Limitations:

1. A smartphone having android operating system is must to use Application.
2. Lack of digital literacy in users may create some limitations for system acceptance.
3. System does not contain any special module for blind people having alzhiemer's disease
4. Some stages in AMYPAD require internet to work as intented.
5. Smart Phone must have enough storage to install application.

Chapter 8

Future Scope

The project has a very vast scope in future. The project can be implemented on cross-platforms in future. Project can be updated in near future as and when requirement for the same arises, as it is very flexible in terms of expansion. With the proposed software of database ready and fully functional the client is now able to manage and hence run the entire work in a much better, accurate and error free .

The future scope of this project is,

- Providing cross platform support
- Implementing randomization of all levels
- Implementing the updates as and when there is a requirement
- Add graphs to show the progress of the player
- Using Machine Learning and Artificial Intelligence equations of statistics generation.

Chapter 9

Conclusion and References

9.1 Conclusion:

Thus the system provides a comprehensive solution for early detection of Alzheimer. This system, is easy to understand, easy to use and offers the simplicity of fast point-and-click service. Alzheimer's disease is one of the biggest concerns many of us have as we get older. The thought of developing the disease can be a frightening prospect, especially if you've witnessed a loved one affected by dementia. By identify and controlling your personal risk factors and leading a brain-healthy lifestyle, you can maximize your chances of lifelong brain health and preserve your cognitive abilities. In order to achieve this a comprehensive solution that provides a way to fight against Alzheimer is what the project aims at.

9.2 References:

https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/symptoms-causes/syc-20350447

https://material.io/resources/icons/?icon=home&style=baseline

https://material.io/resources/icons/?icon=home&style=baseline

https://www.alzheimers.net/1-28-15-SAGE-alzheimers-examination/

https://wexnermedical.osu.edu/brain-spine-neuro/memory-disorders/sage

https://www.alz.org/alzheimers-dementia/diagnosis/medical_tests

http://alzheimerdisease.tv/sage-a-possible-treatment-for-alzheimers-disease/

https://developer.android.com/

https://github.com/medyo/android-about-page

https://www.youtube.com/watch?v=RjpFwkfRM3U