

# ALZHELP



**Guide:**  
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# >>> ACKNOWLEDGEMENT

To develop a project is not a one-man show. It is essentially a collective work, where every step is taken with all precautions and care. Therefore, our first duty is to thank all those who took pain in completing this project.

Firstly, we would like to thanks Mrs.Ushveen kaur, who gave me the golden opportunity to do this wonderful project of “ALHZELP - Alzheimier’s Patients’ Help App”. We are highly indebted for her advice perceptive guidance and constant encouragement at every point of time during this study. Her suggestions and instructions have served as a major contribution towards the completion of the project.



# CERTIFICATE

This is to certify that Japneet Kaur Guliani, Naman Setia, Dhruv Dhingra, Debarpann Chatterjee, Jagriti Malhotra students of B.Sc. (Hons) Computer Science Semester IV have submitted the project entitled “ALZHELP- ALZHEIMER’S PATIENTS’ HELP APP” for the partial fulfillment of the requirements of the Software Engineering project.

It embodies the work done by them during semester IV of their course under the due supervision of Mrs. Ushveen Kaur

DATE

Mrs.Ushveen Kaur



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# INTRODUCTION

**Our app is a mobile-based application that is designed for Alzheimer's patients to help them cope with and ease their condition in several ways. The application operates across three levels with a user-friendly interface to optimise functionality.**

**Brain games have been proven to reduce brain cell damage due to Alzheimer's while supporting the growth of new nerve cells. The first feature of the app includes recreational games to cognitively stimulate patients. These range from jigsaw puzzles and dominos to playing cards and dice.**

**The second function includes a live GPS tracker to help family members track and monitor the patient's movements with a special feature to send alerts when the patients exit a stipulated area.**

**The third function provides the patient with a checklist of activities to do throughout their day which is fed to the system by the caretaker everyday.**



# OBJECTIVE

**Alzheimer's disease is a devastating illness not only for the person diagnosed, but also for their family members and loved ones. Our objective is to cater to these patients in the best way possible through the technology available in hand. The vision is to create a multifaceted application with the following core features :**

**Brain games which will not only keep the patient busy but will also help provide stimulus to improve attention, memory, problem-solving, and cognitive speed.**

**A track of the patient's score in each of these games will be kept and a report will be generated at the end of each month giving an insight about the patient's progress.**

**Since the caretaker may not always be present with the patient, our app will help keep a track of the patient's whereabouts and send an sos if the patient goes out of a certain radius using their phone's location services.**



# PROBLEM STATEMENT

The caretakers of the patients are under this constant pressure that they can't leave the patient out of their sight for long. Other than this, a major challenge faced by the caretakers is to keep the patient busy and involved in activities while making sure that it doesn't get monotonous for them.



# SCOPE OF SOFTWARE

**Our app will provide a platform for Alzheimer's patients to track their day to day activities along with tools to improve their condition if possible.**

**The app will have a well suited UI design with a login page and separate profiles for the patient and their caretakers with different use-cases attached to both fragments.**

**The patient's profile will contain a checklist of activities for him/her to complete throughout the course of their day along with a list of games to keep them engaged and simultaneously try to improve their cognitive abilities.**

**The caretakers' profile will contain an option to update the patient's checklist and another button which will redirect them to a map with the patient's location. The caretaker can set a radius on said map, crossing which will cause the device to trigger an alarm and call the patient's emergency contacts.**

**Both the fragments will contain a status bar depicting the patient's progress level which is updated based on points which they earn while completing tasks and playing games.**

**We hope to provide a reliable yet simple tool to all those suffering from this disease.**



# ADVANTAGES

**Our software, not only works towards improving the patient's cognitive abilities but also keeps them busy.**

**>> The main advantage of our software is that it keeps the family members or the caretakers informed of the patient's location using GPS in their device. If by chance, the patient crosses a set radius, the family members and the caretakers are alerted about the same.**

**>> We have multiple games on our application which will tackle the patient's ability to put some pressure on their minds to think of a solution, thus enhancing their cognitive activities and thinking power.**

**>> A monthly report will be generated based on the points scored by the patient in the games. This will help keep track of the patient's progress and give an overview about their mental health.**



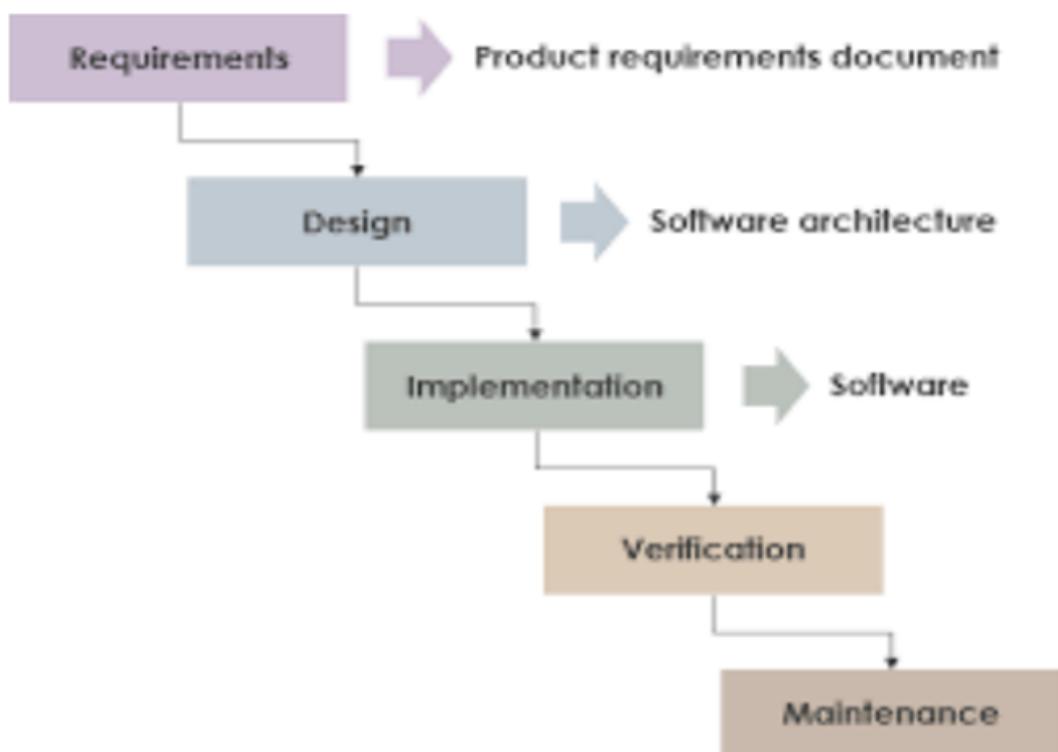
# PROCESS MODEL

A software process model represents the order in which the activities of software development will be undertaken. It describes the sequence in which the phases of the software lifecycle will be performed.

## **Waterfall model**

Separate and distinct phases of specification and development. The illustration below highlights the various phases of what is probably the oldest software development process in existence, namely the classic life-cycle paradigm, sometimes called the “waterfall model”. This paradigm implies a systematic, sequential approach (rarely achieved in practice) to software development that begins at the system level and progresses through analysis, design, coding, testing and maintenance.

**Modelled after the conventional engineering cycle, the life-cycle paradigm encompasses the above activities. Let's take a look at each of these phases in turn and explain what is involved.**



**We have used waterfall model due to limited time and resources.**



# RISK MANAGEMENT

A software team can use risk analysis and management to better understand and manage uncertainty. A software project can be plagued with a slew of issues. A risk is a prospective problem that could occur or not. But Regardless of the consequence, it's a good idea to recognize it and analyze its likelihood.

Determine the likelihood of occurrence, assess the consequences, and devise a contingency plan if the worst happens.

It true that issues arise. Software development is a demanding task. A lot of things can go wrong. Many people do it wrong, and they do it all the time. It is for this reason why being prepared is so important. Recognizing the dangers and taking proactive steps to avoid or mitigate them- is an important aspect of successful software project management.

The first phase, known as "Risk Identification," is to recognize what can go wrong. Then each danger is evaluated to see how likely it is to occur and how much harm it will cause if it occurs. Once you've gathered this information, you'll be able to assess the dangers. They are graded according to their likelihood and influence. Finally, a plan is developed to manage those risk with high probability and high impact.

## **PROJECT RISK**

The project plan is in jeopardy due to project risks. That is, if project risks materialize, the project timetable will most likely be pushed back and expenses will rise. Potential budgetary, scheduling, human, resource, stakeholder, and requirements problems, as well as their influence on a software project, are identified as project risks.

## **TECHNICAL RISK**

Technical hazards pose a threat to the software's quality and timeliness. If a technical danger becomes a reality, there will be issues with implementation, interface, verification, and maintenance. A risk element includes also ambiguous specifications, technological uncertainty, technical obsolescence, and "cutting edge" technology. Because the problem is more difficult to address, technical dangers arise.

## **BUSINESS RISK**

Business risks threaten the viability of the software to be built and often jeopardize the project or the product. Candidates for the top five business risks are :

**Market risk : Building an excellent product or system that no one really wants.**

**Strategic risk: Building a product that no longer fits into the overall business strategy for the company .**

**Sales risk: building a product that the sales force doesn't understand how to sell.**

**Management risk: Losing the support of senior management due to a change in focus or a change in people.**

**Budget risk: losing budgetary or personnel commitment.**



# RMMM TABLE

S.No	RISK	CATEGORY	PROBABILITY	IMPACT	RMMM PLAN
1	Number of people assigned for the project are inadequate to do the job	Project Risk	10%	2	<ul style="list-style-type: none"> <li>Organise task network.</li> <li>Assign backup staff member as third party for testing and review.</li> </ul>
2	During the course of the project, some team members find better opportunities and leave.	Technical Risk	20%	2	<p>Qualified replacement to serve the task of the person.</p> <ul style="list-style-type: none"> <li>Documentation of the project should be handy in case a fresher needs to be involved.</li> </ul>
3	Customer will change the requirements.	Project Risk	10%	2	<p>Update the employers regularly about the status and working assumptions.</p> <ul style="list-style-type: none"> <li>Get Customers' feedback periodically.</li> </ul>
4	Delivery deadline may be tightened.	Business Risk	20%	2	<p>Schedule made should be realistic and achievable.</p> <ul style="list-style-type: none"> <li>Monitor that efforts put are according to schedule.</li> </ul>

5	Team dissension/ Lack cohesion	Project Risk	10%	3	Some guidelines and rules should be set describing how to deal with each other.
6	The project may have to deal with customers that are illiterate thus lacking them to understand the functionality of the project system and finding it difficult to interact with the system.	Business Risk	10%	4	Proper Management of staff/attendant would help to reduce this risk. The customer could verbally communicate with the attendant and resolve their difficulty in handling the system.



# TIMELINE CHART

SNo	PROCESS/PHASE	START DATE	END DATE
1.	Requirements gathering	10-02-2022	16-02-2022
2.	Requirement analysis	17-02-2022	20-02-2022
3.	Risk management plan	21-02-2022	25-02-2022
4.	Data dictionary preparation	27-02-2022	04-03-2022
5.	FPA calculation	06-03-2022	12-03-2022
6.	DFD preparation	14-03-2022	20-03-2022
7.	Database Design	21-03-2022	25-03-2022
8.	Screen Design	27-03-2022	31-03-2022
9.	Pseudo code	01-04-2022	10-04-2022
10.	**Project Management	11-04-2022	15-04-2022



# INITIAL REQUIREMENTS

**Purpose:** The purpose of this software is to help Alzheimer patient improve their memory by engaging them in fun activities/ games. It will help the family track and monitor the patient's movements.

- User login : The patient's as well as their family members first have to register themselves to login and link their accounts.
- Activities: An activity will be assigned to the patient's on a daily basis. These activities will help nurture their brains.
- The Software provides a family friendly interface which allows them to monitor the patient's profile and location.
- Tracker: Their family members will have 24x7 access to the patient's location, and an alert will be sent if the patient goes out of a certain specified vicinity.



# REQUIREMENTS ANALYSIS

**Questions we asked the doctor :**

**Dr. S.K. Singh**

**Ques1 : What activities do you recommend ?**

Ans : Establish a daily routine. Card games, Jumbled words, Sorting a-z | 1-10, spot the difference.

**Ques2: To what extent do you think this app can help improve the patient's memory?**

This app might help them manage their daily errands by adding to-do lists. Moreover, the activities will help them keep busy and stimulate their minds and challenge their mental, physical and functional abilities. This will help them improve their brain functions, such as attention, concentration and focus.

**Ques 3: How can these activities help the patient?**

Ans: You can help slow the decline of their memory and cognitive abilities, and help them to remain as independent for as long as possible, by keeping them busy with games and activities that stimulate the mind and challenge their mental, functional, and physical abilities.

## **Questions we asked the patient's family members:**

### **Ques 1: What challenges do you face?**

**Ans:** One of the family members has to be there always to look after the patient. Their memory loss and mental problems make them difficult to deal with. The care taker must have extreme patience to look after them.

### **Ques 2: What additional features can be helpful to you?**

**The app should consist of activities which may help keep their minds active or enhance their thinking skills and slow down their memory loss. For instance some games like jigsaw puzzle, word games, number games, sudoku.**

### **Ques 3: How much time has it been since you encountered his disorder?**

**Ans:** It has been 5 months since we learnt about his problem and we have been facing this for at least 7 months but we did not consult any doctor till 2 months.

### **Ques 4: What were the initial noticeable symptoms?**

**Ans:** In the early days, he used to forget to run some errands. He was shockingly sleeping more and forgot phone numbers. I gave him some things to do but he used to forget most of them.

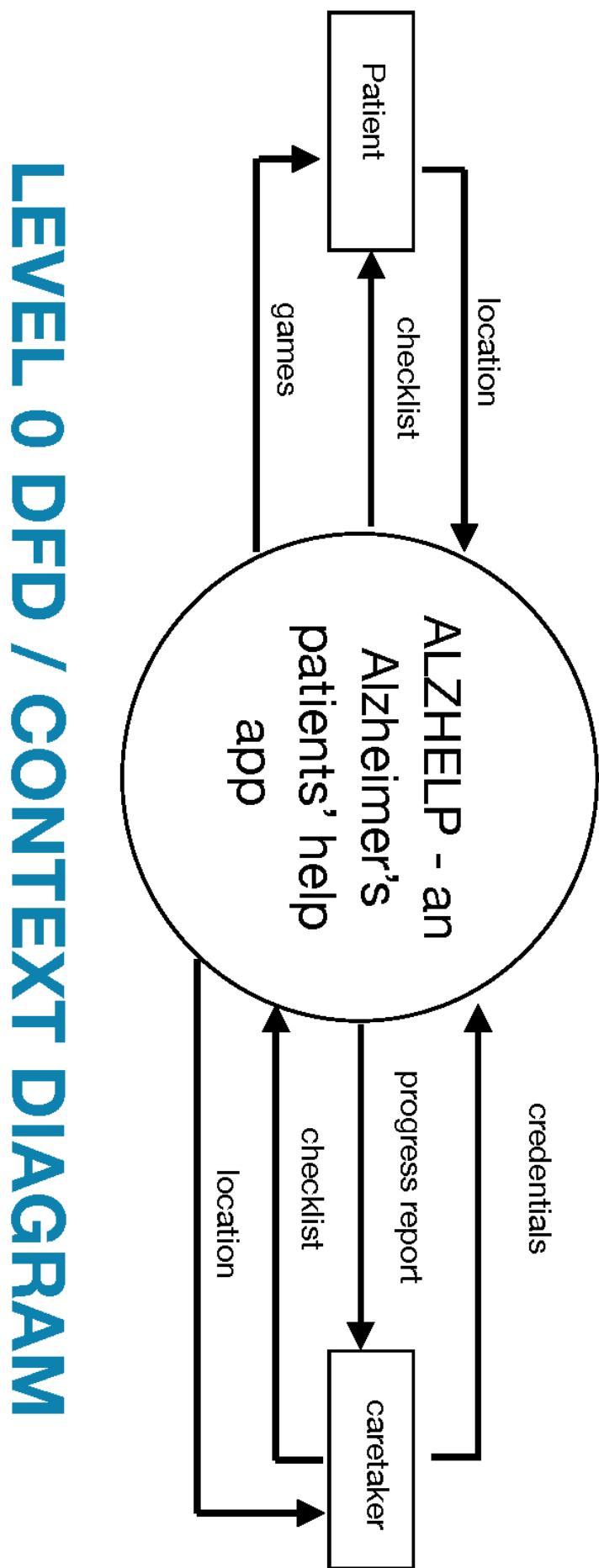


# **FINAL REQUIREMENTS**

**Purpose:** The purpose of this software is to help alzheimer patient improve their memory by engaging them in fun activities/ games. It will help the family track and monitor the patient's movements.

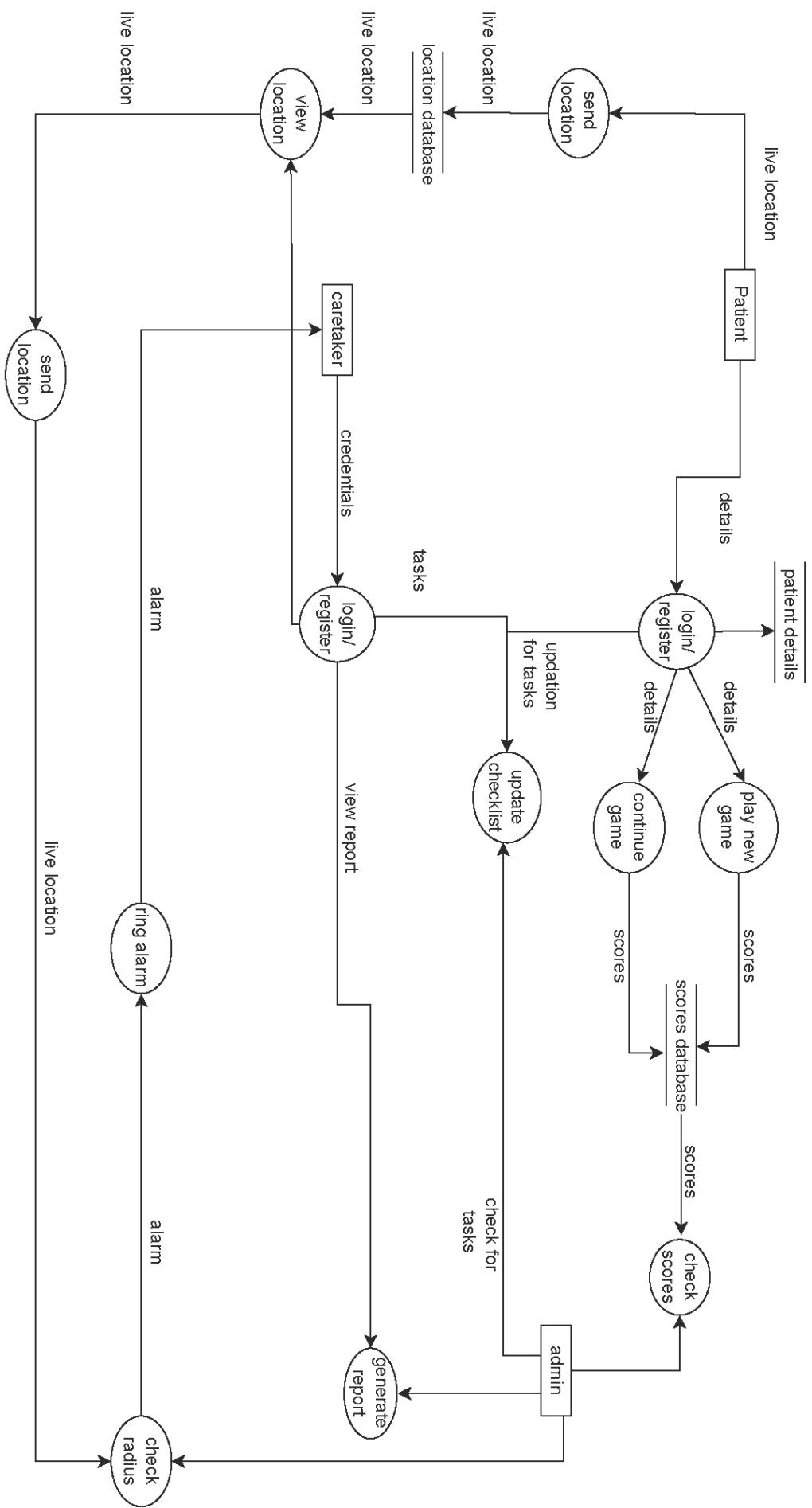
- **User login :** The patient's as well as their family members first have to register themselves to login and link their accounts.
- **Activities:** An activity will be assigned to the patient's on a daily basis. These activities will help nurture their brains.
- **The Software provides a family friendly interface which allows them to monitor the patient's profile and location.**
- **Tracker:** Their family members will have 24x7 access to the patient's location, and an alert will be sent if the patient goes out of a certain specified vicinity.
- **Report:** Monthly report generation of points scored by the patient in various games.
- **Checklist :** The caretaker can assign daily tasks to the patient.

# DFD LEVEL 0

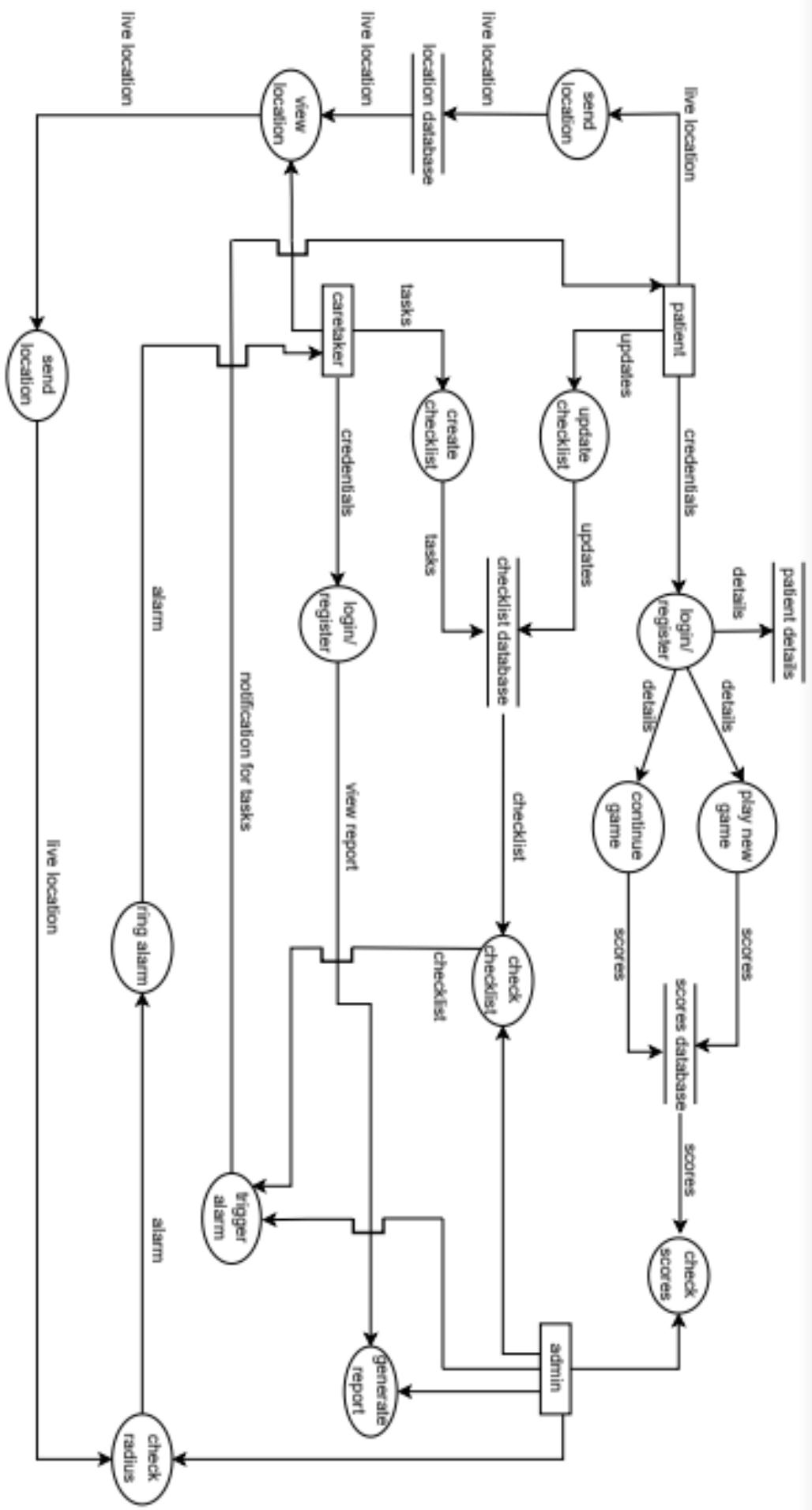


**LEVEL 0 DFD / CONTEXT DIAGRAM**

# DFD LEVEL 1



# DFD LEVEL 2



# USE CASE DIAGRAMS





# FUNCTIONAL POINT ANALYSIS

FPA is a standard metric for the relative size and complexity of a software system, originally developed by Alan Albrecht of IBM in the late 1970s.

Function Points (FPs) can be used to estimate the relative size and complexity of software in the early stages of development-analysis and design.

The size is determined by identifying the components of the system as seen by the end-user: the inputs, outputs, inquiries, interfaces to other systems, and logical internal files.

The components are classified as simple, average, or complex. All of these values are then scored and the total is expressed in Unadjusted FPs (UFPs). Complexity factors described by 14 general systems characteristics, such as reusability, performance, and complexity of processing can be used to weight the UFP. Factors are also weighed on scale of 0- not present, 1- minor influence, to 5- strong influence. The result of these computations is a number that correlates to system size.

Although the FP metric doesn't correspond to any actual physical attribute of a software system (such as lines of code or the number of subroutines)

It is useful as a relative measure for comparing projects, measuring productivity, and estimating the amount development effort and time needed for a project.

## COMPLEXITY ADJUSTMENT VALUE TABLE

S.NO	Questions	VAFs
1.	Does the system require reliable backup and recovery?	3
2.	Are specialized data communications required <sup>top</sup> transfer information to or from the application?	3
3.	Are there distributed processing functions?	3
4.	Is performance critical?	4
5.	Will the system run in an existing, heavily utilized operational environment?	3
6.	Does the system require online data entry?	2
7.	Does the online data enquiry require the input transaction to be built over multiple screens or operations?	3
8.	Are the ILFs updated online?	2
9.	Are the inputs, outputs, files or inquiries complex?	3
10.	Is the internal processing complex?	4
11.	Is the code designed to be reusable?	3
12.	Are conversion and installation included in the design?	3
13.	Is the system designed for multiple installations?	4
14.	Is the application designed to facilitate change and ease of use by the user?	3
	<b>Total degree of influence (TDI)</b>	<b>43</b>

## INPUTS

Input name	Fields	Tables	Complexity
User Login	2	1	avg
Patient Details	8	1	avg
Tasks	2	1	avg
Location	2	1	avg

## OUTPUTS

Output Name	Field s	Tables	Complexity
Report	2	1	avg
Location	2	1	avg
Ring Alarm	4	2	avg

## QUERIES

Name	Fields	Tables	Complexity
View Scores	2	1	avg
View Live Location	2	1	avg
View Checklist	2	1	avg

## TABLES

Name	Field	Complexity
Details	10	avg
Scores	2	avg
Location	2	avg
Checklist	2	avg

## TABLE FOR FUNCTION POINT

Type	Complexity of components			
	Low	Avg	High	Total
External Inputs	3*0	4*4	6*0	16
External outputs	4*0	5*3	7*0	15
External Inquiries	3*0	4*3	6*0	12
Internal Tables	7*0	10*4	15*0	40
External logical files	5*0	7*4	10*0	28
Total UAFP	0	111	0	111

## FPA CALCULATION

$$\begin{aligned} \text{FP} &= [0.65 + (0.01 \times \text{TDI})] * \text{UAFP} \\ &= [0.65 + (0.01) * 43] * 111 \\ &= 119.88 \end{aligned}$$



# DATA DESIGN

```
[mysql] describe scores;
+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| game  | varchar(20) | YES  |     | NULL    |       |
| scores | int        | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)
```

```
[mysql] describe checklist;
+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| task  | varchar(20) | YES  |     | NULL    |       |
| reminder | time     | YES  |     | NULL    |       |
| checkif | bit(1)    | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

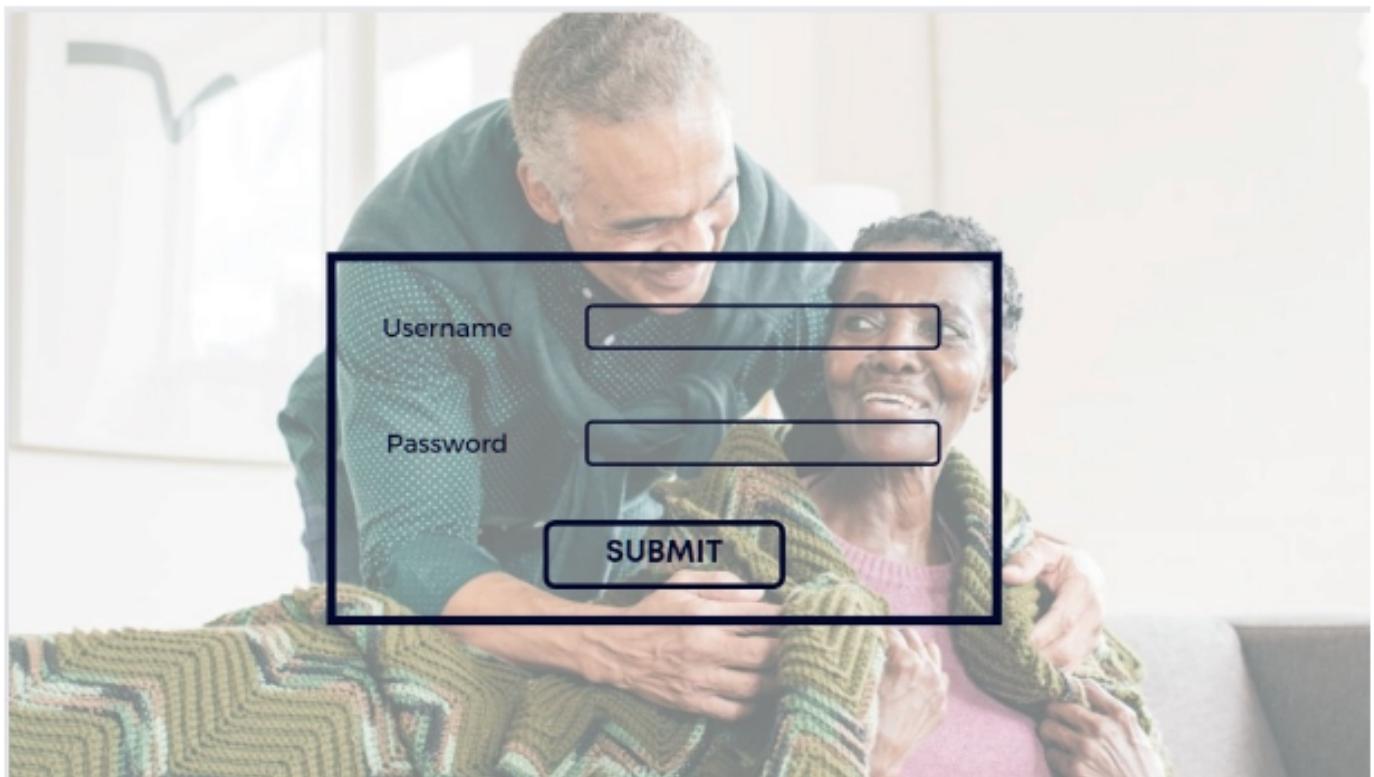
```
[mysql] describe location;
+-----+-----+-----+-----+-----+
| Field      | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| x_coordinate | int  | NO   | PRI | NULL    |       |
| y_coordinate | int  | NO   | PRI | NULL    |       |
+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)
```

```
[mysql] > describe patient_details;
+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| username    | varchar(20) | NO   | PRI | NULL    |       |
| password    | varchar(20) | NO   | PRI | NULL    |       |
| patient_name | varchar(30) | NO   |      | NULL    |       |
| patient_age  | int         | NO   |      | NULL    |       |
| patient_gender | varchar(20) | YES  |      | NULL    |       |
| caretaker_name | varchar(30) | NO   |      | NULL    |       |
| caretaker_age | int         | NO   |      | NULL    |       |
| mobile_number | int         | NO   |      | NULL    |       |
| email_id     | varchar(30) | NO   |      | NULL    |       |
| address      | varchar(100) | YES  |      | NULL    |       |
+-----+-----+-----+-----+-----+
10 rows in set (0.01 sec)
```

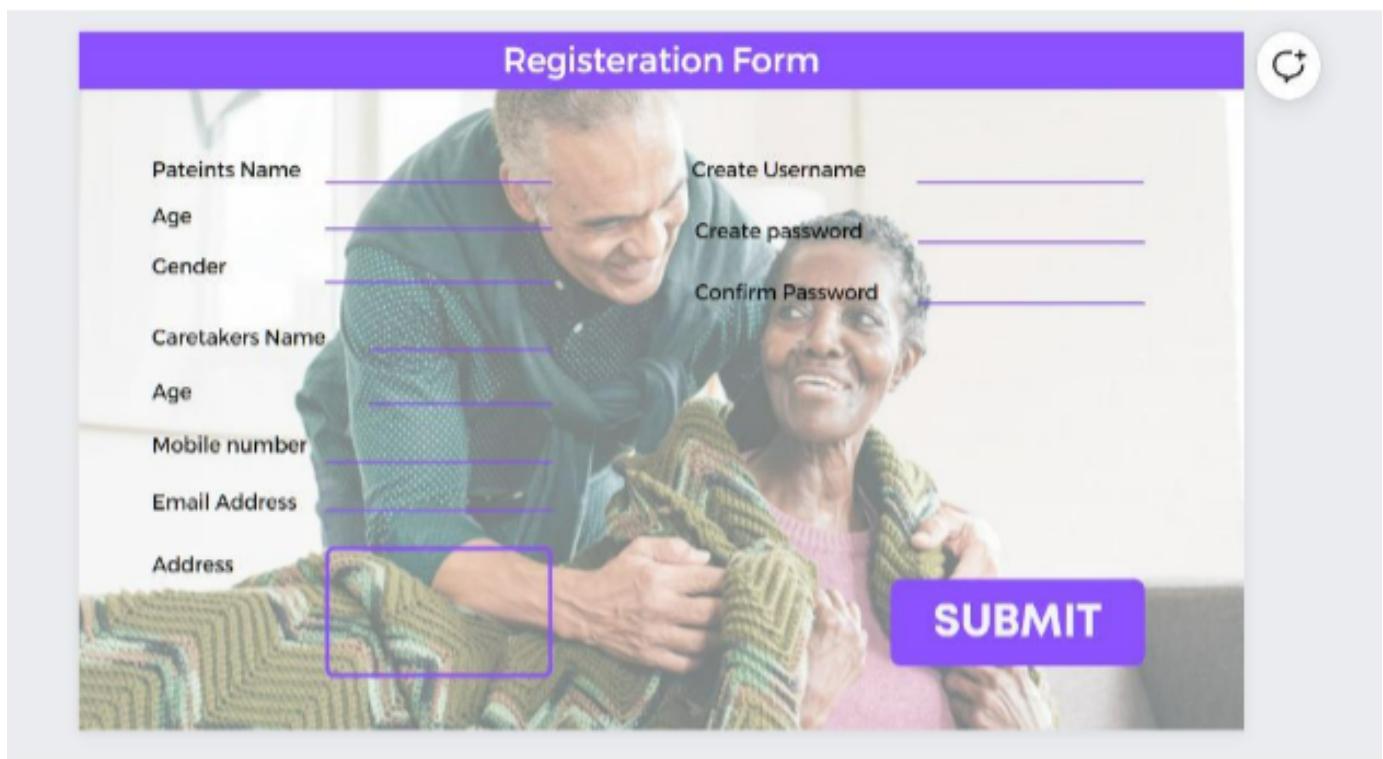


# INTERFACE DESIGN

## 1. LOGIN PORTAL



## 2. REGISTRATION



**Registration Form**

Pateints Name \_\_\_\_\_

Age \_\_\_\_\_

Gender \_\_\_\_\_

Caretakers Name \_\_\_\_\_

Age \_\_\_\_\_

Mobile number \_\_\_\_\_

Email Address \_\_\_\_\_

Address \_\_\_\_\_

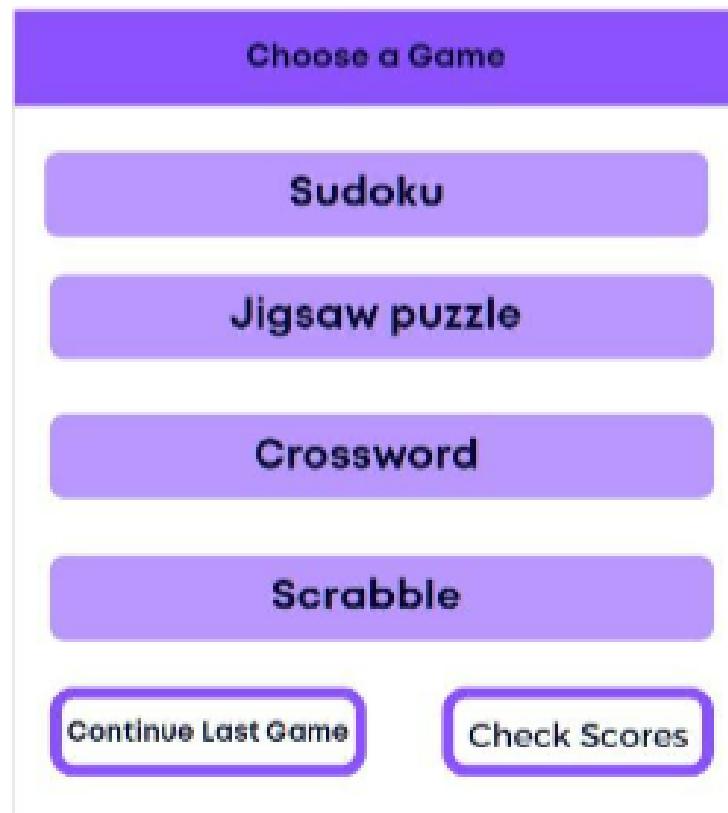
Create Username \_\_\_\_\_

Create password \_\_\_\_\_

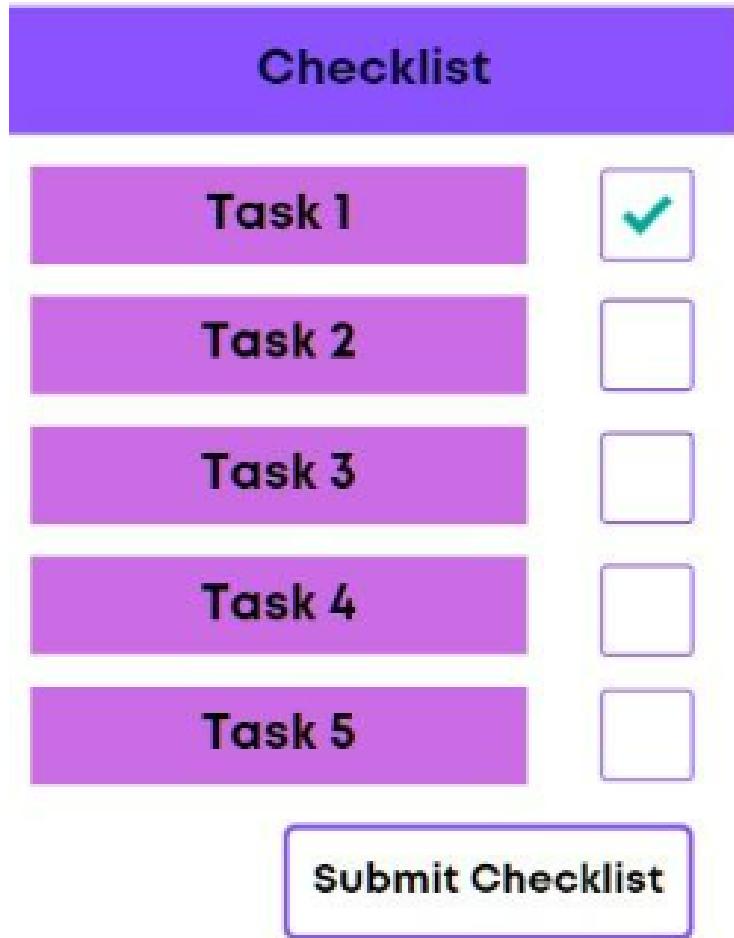
Confirm Password \_\_\_\_\_

**SUBMIT**

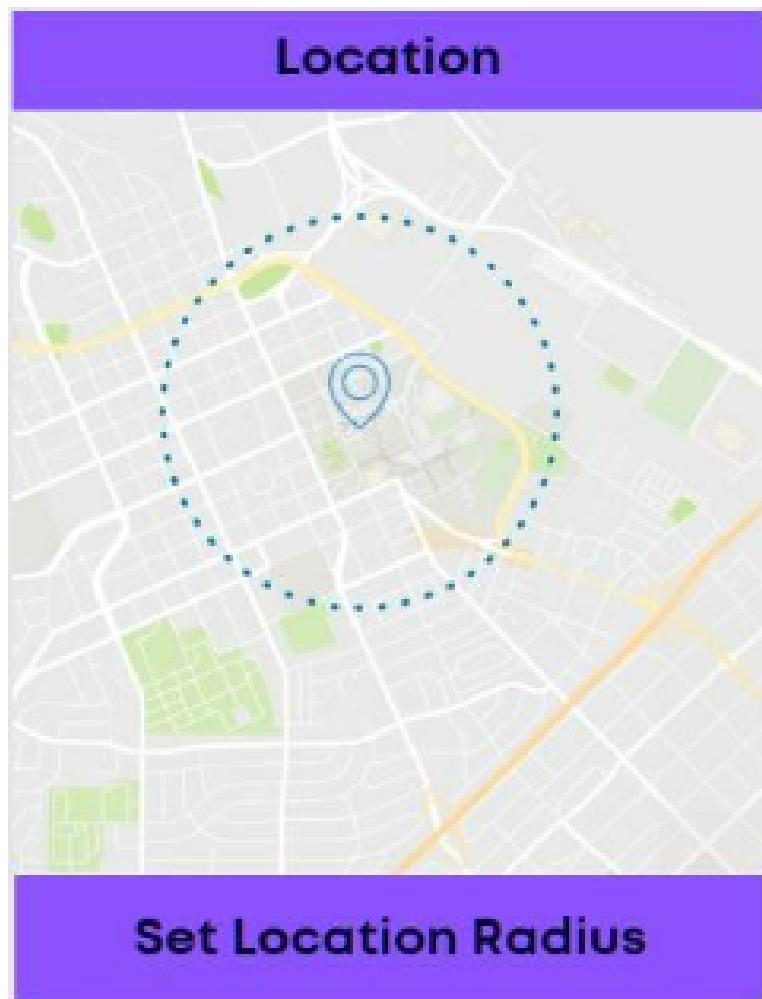
### 3. GAME INTERFACE



### 4. CHECKLIST



## 5. LOCATION



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