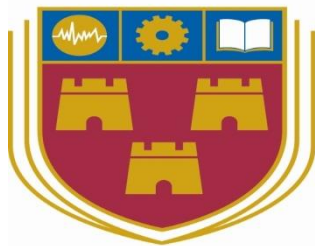# Hashi Puzzle (Islands and Bridges) Design Document

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Technical Document

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Contents

Abstract

This is a Design document on a Puzzle game called Hashi (Islands And Bridges).

This document describes using images and diagram on how the application will function and the user interface of the application.

This document will provide understanding of how the application will by providing Images and diagrams.

Goals

The Goal of this project is to design and implement a mobile application for Android, Windows Phone or IOS, I have chosen to implement this application on a Android mobile device because I have worked with android development before so this will put in a better position to start the project.

The Goal of the application is to let the user to solve the game by connecting islands using bridges. The application should generate a map at random making a unique map every time the user wants to play making it less more interesting for the user. The application will then store the time it took the user to solve the game. The user will then be prompt for their name and will be displayed with a leader board place based on their score.

The intend audience for this project is anyone that has an android mobile device.

Functional Description

User Interface

- o Main menu consists 3 buttons "Start game", "Rules of the Game" and "Exit" each different button will have its own functionality the buttons will be located in the middle of the screen one below each other.
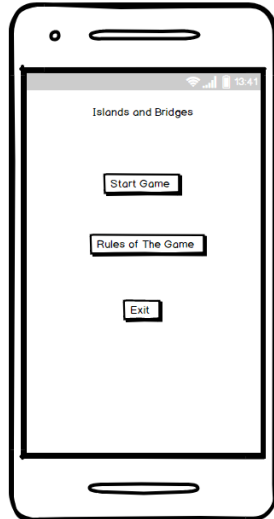
Creating A New Game

- Once the user selects the start game he will be prompt with a widow to choose a Easy (4x4),Medium (7x7) or Hard(10x10) level this will open different kind of maps for the user to solver.
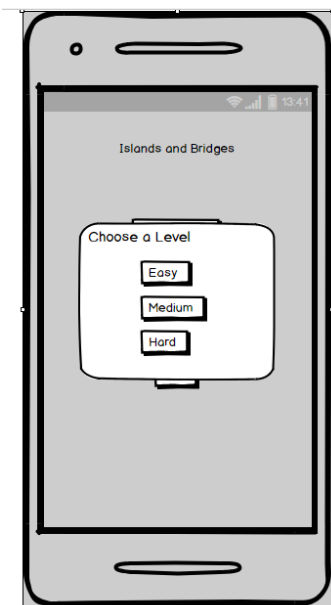
- The user will then select the level they want to play, the application will generate the map accordingly to the level selected by the user and the Timer will start.
  If the user wishes to reset the game, There is a button provided for this functionality called "Reset".
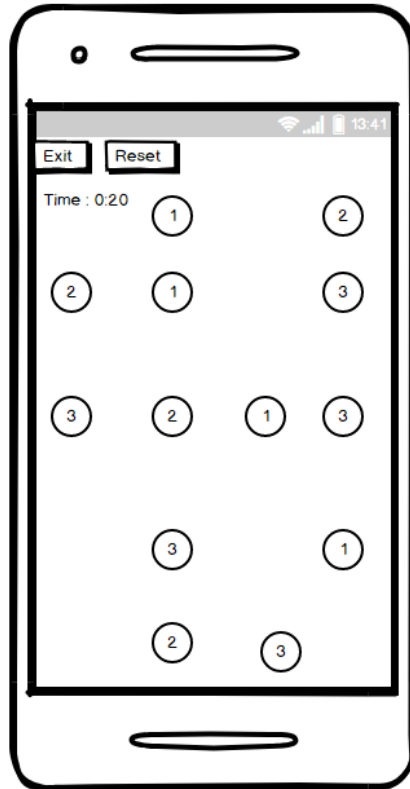
- The next screen starts when the user has solved the puzzle and the system will ask them for their name/nickname to have a place in the leader boards. The scored is being calculated by the time it has taken the user to solve the puzzle and the map the have selected. There is a textbox provided for the user to enter their name, once he/she has done they will be prompt with their score board place.

Islands and Bridges

Logical Software Architecture
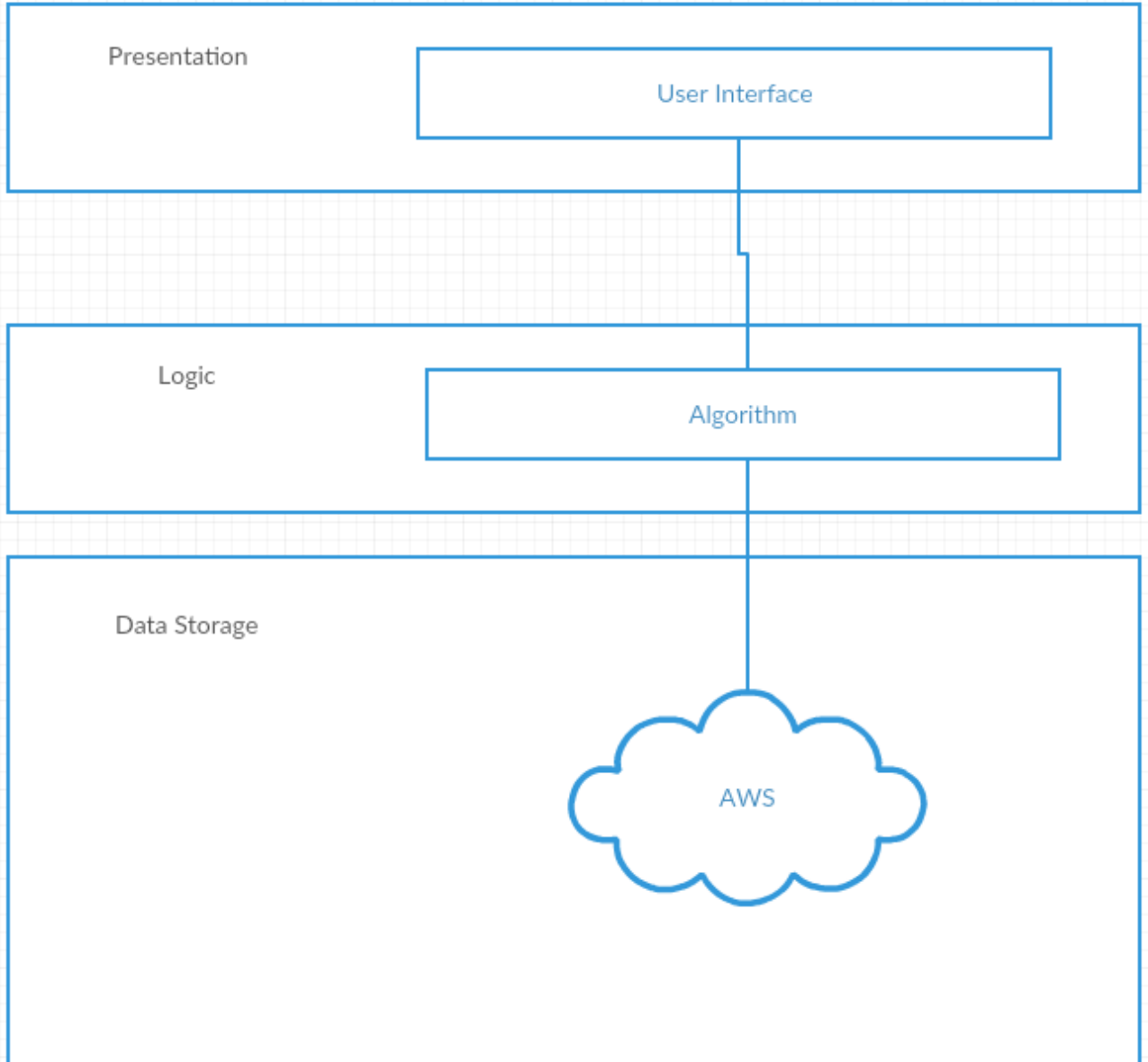
Presentation.

This layer of the system is a layer where the user interacts with our system by selecting the game mode they want to play. The user interface needs to be user friendly and it must look/work the same across multiple different browser types. The UI for mobile users will look slightly different than the one on Desktops or laptops, although the design will be different all the functions of the website will work the same.

Logic

This layer of the system is the algorithm used to generate the map and check if its solvable. The algorithm is implemented using a 2 d array that will randomly generate the islands and it will use a recursive algorithm to ad a bridge to a node and check if its equal to the number in the node.

Data

This layer is where I am going to store my data, I am using AWS mobile services to create a NoSql database using amazon mobile hub.

Target Platforms

My system is platform restricted it will only work for users with android device, it can be only accessed by the android OS device, A desktop version will be available for all the browsers making it easier to access and more user could play the game.

Design Overview

Once the user selects the game mode, the map and timer will display, the timer will keep incrementing until the user solves the puzzle even if he wishes to reset the map. Once the user have successfully solved the puzzle an input box with a message will be displayed asking them for their name or nickname, once the user has entered their name or nickname leader board place and score will be display back to the user based on their time and map they have selected

Use case Diagram
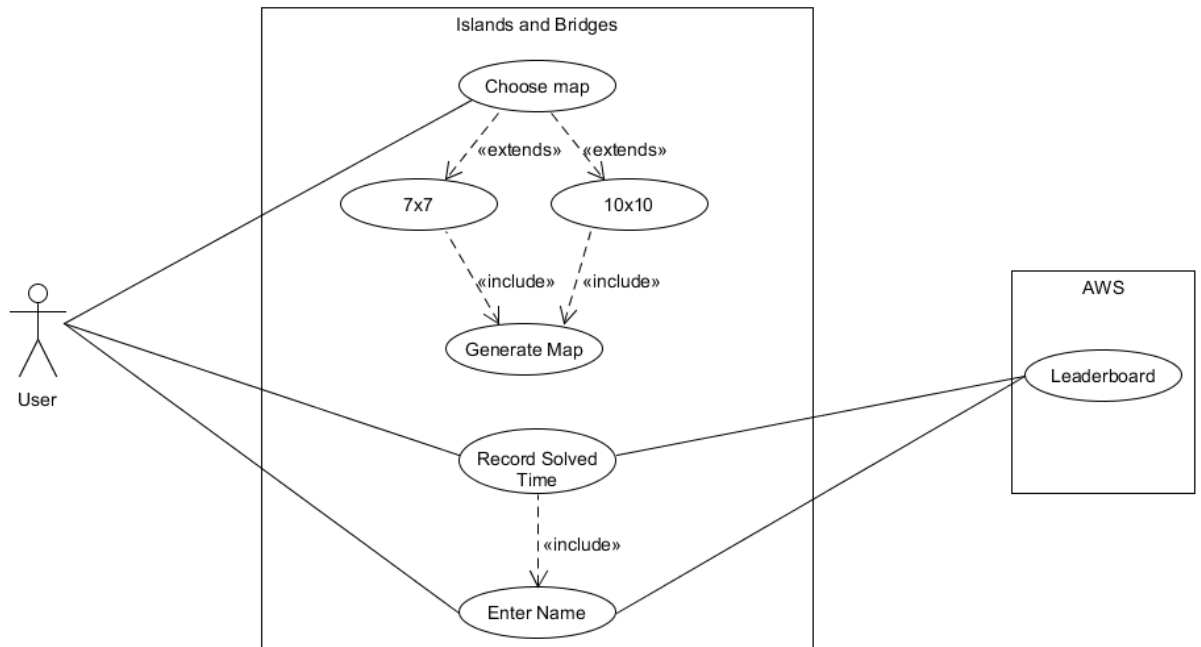
Brief Use Cases

1: Choose Map,7x7,10x10, Generate Map

Actors Involved: User.

This use case starts when the user wants to start to play the puzzle game. The relevant menu is shown to the user. The user clicks on the Start Game button and the chooses to whether they want to play the 7x7 map or the 10x10 map depending on their experience level. The system will then generate a map accordingly to the option the user has chosen.

2: Record Solved Time

Actors Involved: User, AWS

This use case starts when the user has solved the map. The relevant map is shown to the user. The user gets his time recorded it took them to solve them puzzle. The system will then generate a leader board entry accordingly to the map selected.

3: Enter Name

Actors Involved: User.

This use case starts when the user has solved the map. The relevant Input textbox is shown to the user. The user will be asked to enter their name to check his place on the leader board. The system will then store the score of the player based on the map and the time it took them to solve it and generate the lead board entry and display the place to the user.

Detailed Use Case

1: Choose Map,7x7,10x10, Generate Map

Actors Involved: User.

This use case starts when the user wants to start to play the puzzle game. The relevant menu is shown to the user. The user clicks on the Start Game button and the chooses to whether they want to play the 7x7 map or the 10x10 map depending on their experience level. The system will then generate a map accordingly to the option the user has chosen.

Main Success Scenario:

1. This will start when the user want to start the game.
2. The game menu will appear on the screen and user clicks on the Start Game button.
3. After user clicks on the Start Game button the game will start and a new menu is generated.
4. The user chooses to play 7x7 or the 10x10 map.
5. The system generates the map accordingly to the user's choice.

Alternatives:

5a. if the user finds that the map that has been generated is too hard for them they can Click The Reset button to load a different one.

2: Record Solved Time

Actors Involved: User, AWS

This use case starts when the user has solved the map. The relevant map is shown to the user. The user gets his time recorded it took them to solve them puzzle. The system will then generate a leader board entry accordingly to the map selected.

Main Success Scenario:

1. This will start when the user has successfully solved the puzzle.
2. The user will get his time recorded it took to solve the puzzle.
3. The system will then store the recorded time in the cloud.

Alternatives

2a. If the user does not complete the puzzle in a 30 min period, the puzzle will reset.

3: Enter Name

Actors Involved: User.

This use case starts when the user has solved the map. The relevant Input textbox is shown to the user. The user will be asked to enter their name to check his place on the leader board. The system will then store the score of the player based on the map and the time it took them to solve it and generate the lead board entry and display the place to the user.

Main Success Scenario:

1. This use case starts when the user solved the map.
2. The user will be presented with an input box for their name.
3. The user inputs their name/nickname.
4. The system stores the name, recorded time and map selected on the AWS.
5. The system Displays the leader board place to the user.

Alternatives

3a. if the user does not provide his name the score will be deleted.

4a. if the user will not have internet access the leader board will still ask him for the name but will update whenever the user reaches a internet access.

Sequence Diagram