



FPT UNIVERSITY

Concentration Game

| **BNT Group**

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I. Problem Definition

Concentration game is a memory card-based game. To win this game, players have to clear all folded cards. However, players can only unfold 2 cards at a time so they have to remember card's picture and position in order to beat the game in the shortest time. The game uses a simple interface suitable for all ages. In-game images are added by each developer according to a certain theme. Over the time, due to its easy-to-play and brain-training gameplay, it became popular and has been remade in various version by many developers.

Ours game will have these functions:

- Difficulty: There will be 3 difference difficulty: An Easy Mode which a baby can win, A Normal one and A Hard Mode that only pro players can beat it.
- Custom Mode: Player can adjust number of rows, number of collums and timer.
- Themes: Player can choose the game's theme: PvZ, Animal, Fruits and Vegetables, etc.
- Leaderboard: Rank player on theirs score. Score will depend on numbers of game mode, number of cleared cards in a game and extra time.



FIGURE 1 A CONCENTRATION GAME'S VARIANT

II. User Requirements

1. Functions

The game consists of a number of cards base on number of rows and columns. When the first and second card are flipped, and if 2 pictures on them are not the same, then after 1 second, they will automatically be folded. Otherwise, if the two images are the same, they will disappear automatically. The game will end when all cards are cleared. The number of cards also increasing along with the difficulty.

2. System Requirements

Hardware Requirement (minimum)	Hardware Requirement (recommended)
+ CPU: Intel Pentium 2 266 MHz + RAM: 128 MB + Storage: 128 MB of free disk space	+ CPU: Intel Core i9 9900K 3.6 GHz + RAM: 16 GB + Storage: 256 GB of free disk space

Software Requirement
+ Window XP or higher + JRE 1.7 or higher



III. Roles

No	Role	Member	Responsibilities
1	Leader	ThanhKH	Creating Schedule and Check List, Assigning assignment to team members
2	Secretary	NhanDT	Taking note
3	Analyst & Design	ThanhKH, NhanDT, BangNT	Table of content, Problem Defining, User Requirement. Interface Designing
4	Coder	ThanhKH, NhanDT, BangNT	Programing all functions for applications
5	Tester	NhanDT, ThanhKH	Testing all functions
6	Maintenance	NhanDT, BangNT	Checking and backup data



IV. Schedule

No.	Assignment	Member	Start Time	Estimate time to finish (hrs)	Deadline
1	Problem Definition	ThanhKH, NhanDT	20/05/2019	4	23h50 20/05/2019
2	User Requirement and System Requirement	BangNT	21/05/2019	4	23h50 21/05/2019
3	Analysis	ThanhKH	22/05/2019	12	23h50 22/05/2019
4	Book cover design and Group logo design	ThanhKH, NhanDT, BangNT	23/05/2019	12	23h50 23/05/2019
5	Basic GUI Design	ThanhKH, NhanDT, BangNT	24/05/2019	12	23h50 24/05/2019
6	Cards & Themes Design	ThanhKH, BangNT	25/05/2019	16	23h50 26/05/2019
7	Algorithm Diagram	NhanDT	27/05/2019	5	23h50 28/05/2019
8	Normal Mode & Subclasses Coding	ThanhKH	29/05/2019	24	23h50 30/05/2019
9	Custom Mode Coding	ThanhKH	31/05/2019	8	23h50 01/06/2019

10	PlayerManagement Class & Log in Function Coding	NhanDT	31/05/2019	12	23h50 01/06/2019
11	Leaderboard Function Coding	NhanDT	01/06/2019	12	23h50 02/06/2019
12	Themes Function Coding & Credits Design	BangNT	01/06/2019	8	23h50 02/06/2019
13	Detail GUI Design	ThanhKH, NhanDT, BangNT	02/06/2019	24	23h50 03/06/2019
14	Testing & Debugging	ThanhKH, NhanDT	04/06/2019	12	23h50 05/06/2019
15	Document Finishing	BangNT, NhanDT	06/06/2019	4	23h50 07/06/2019
16	Presentation	BangNT	10/06/2019	2	12/06/2019
17	Implementation	BangNT, NhanDT	13/06/2019	3	17h00 13/06/2019

V. Design Pattern

1. Program Interface

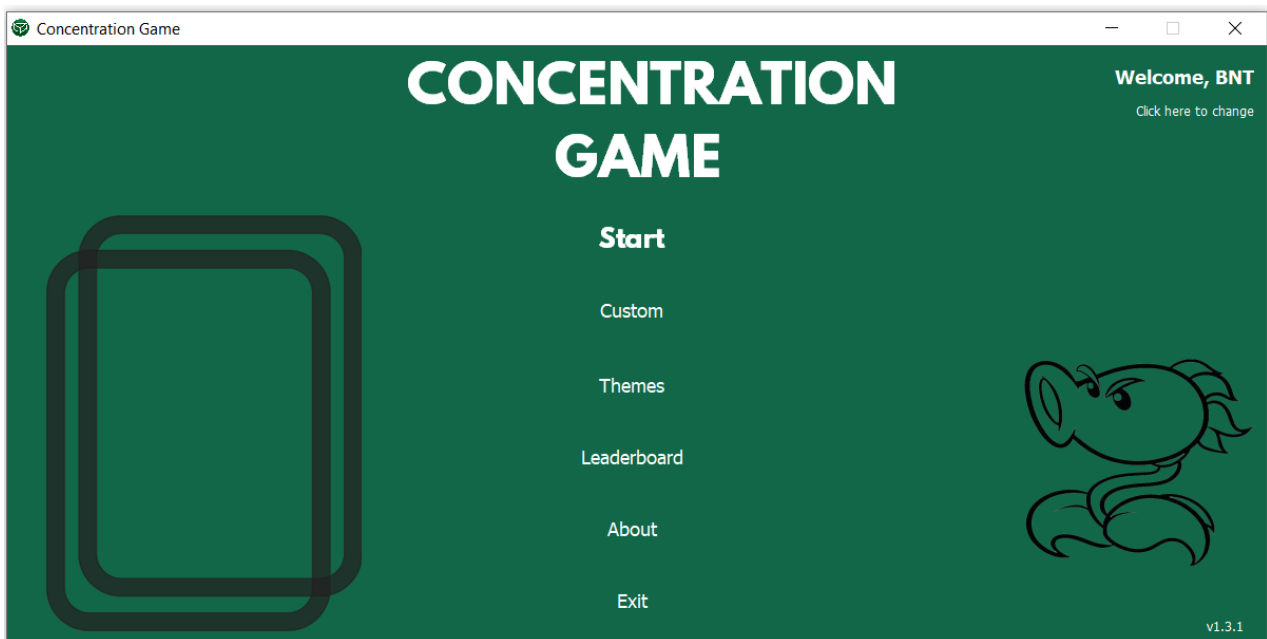


FIGURE 3 MAIN MENU

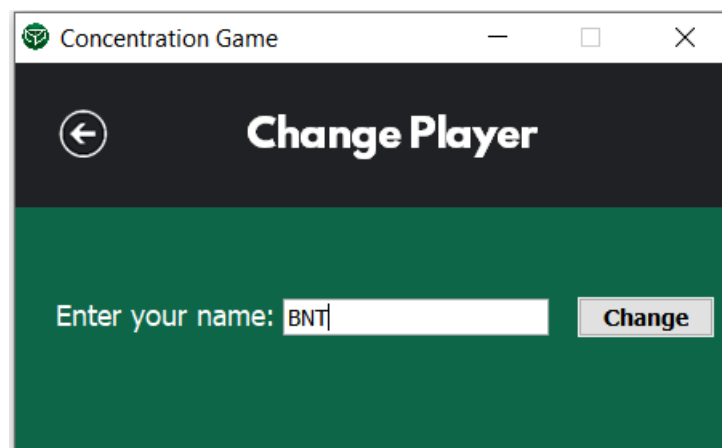


FIGURE 4 LOG IN

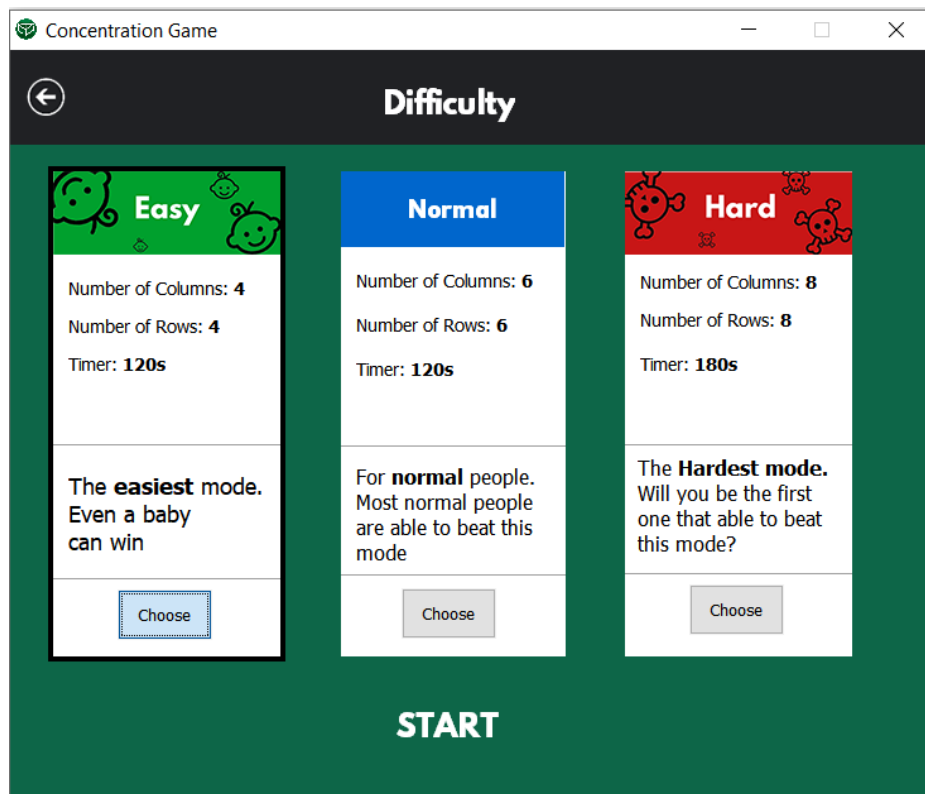


FIGURE 5 DIFFICULTY CHOOSING

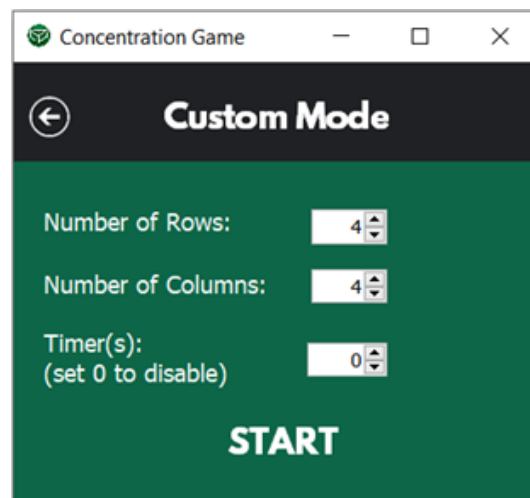


FIGURE 6 CUSTOM MODE

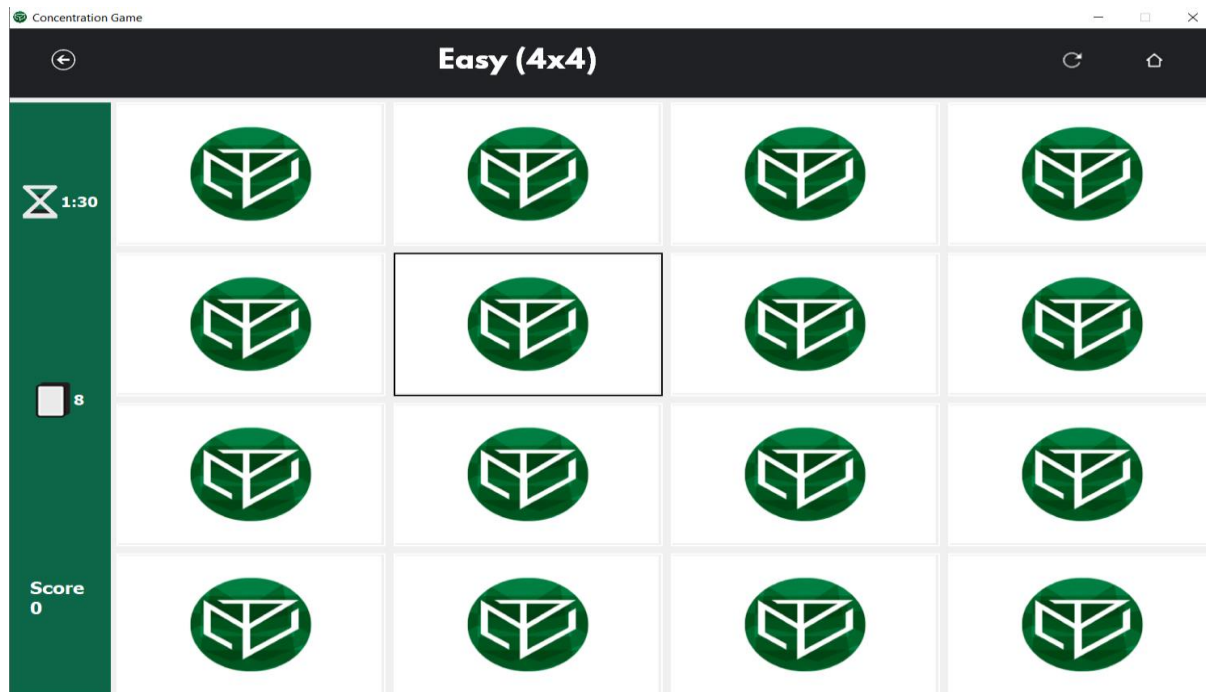


FIGURE 6 IN-GAME INTERFACE

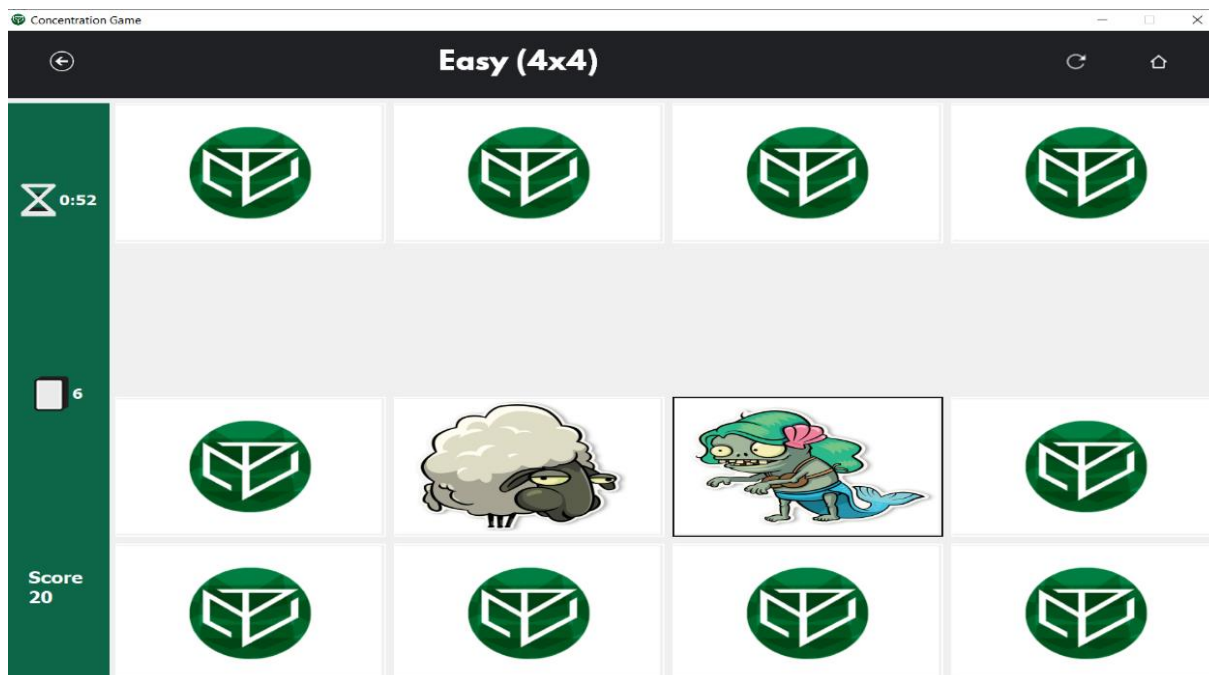


FIGURE 7 IN-GAME INTERFACE (2)

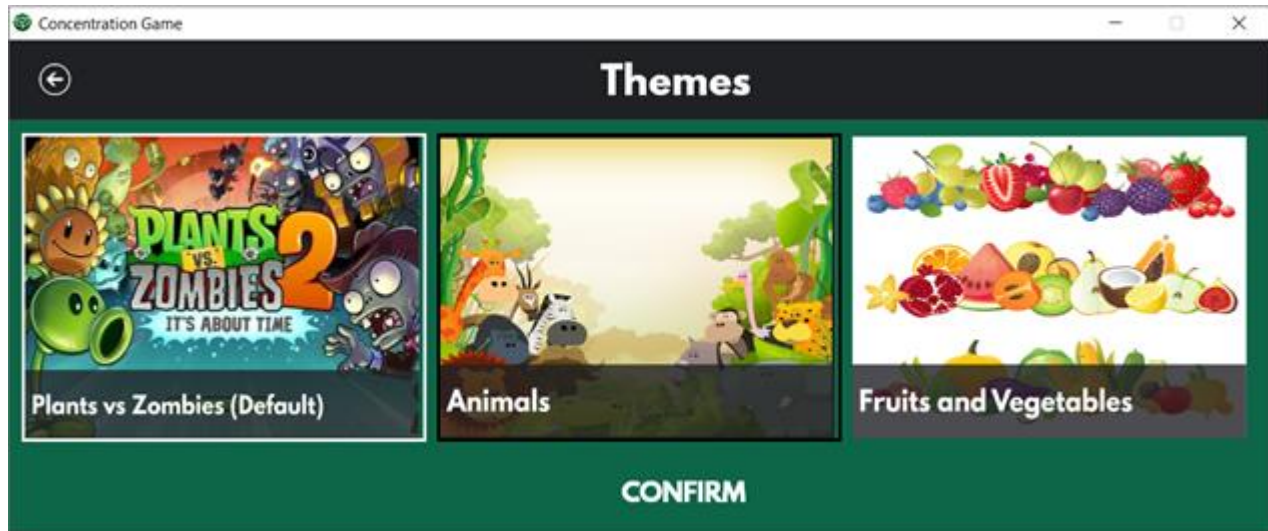


FIGURE 8 THEMES MANAGER

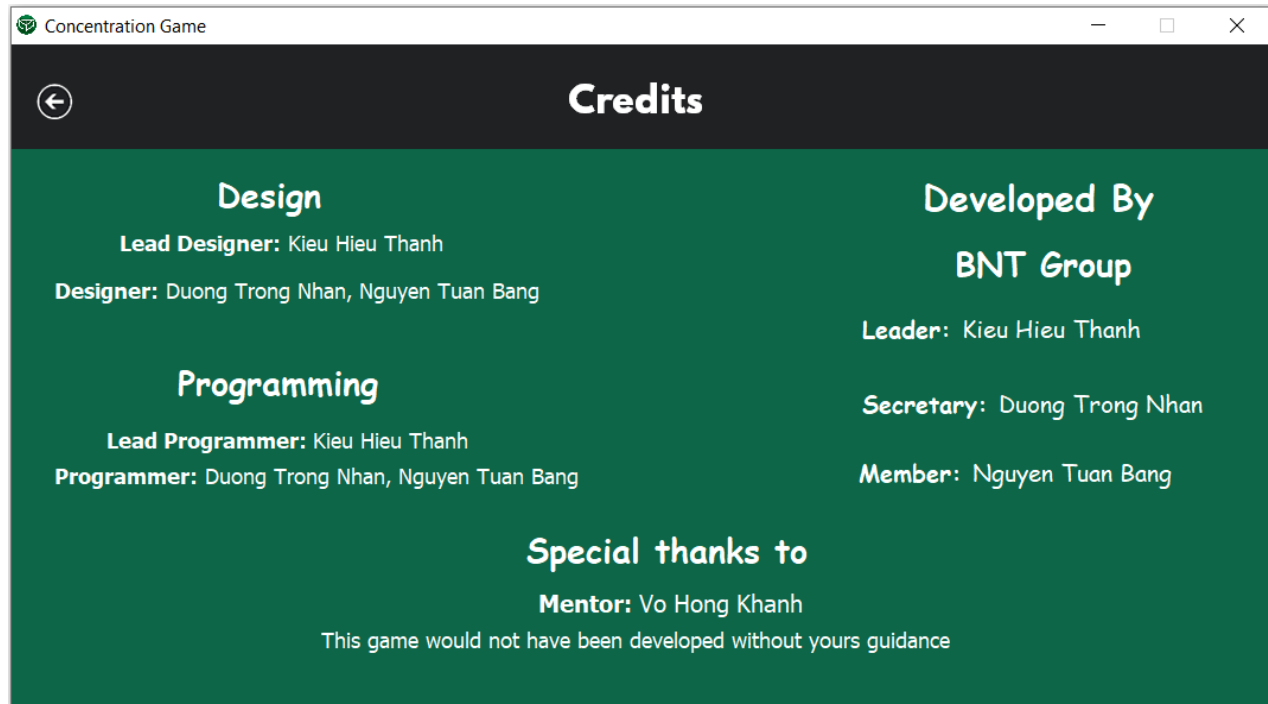
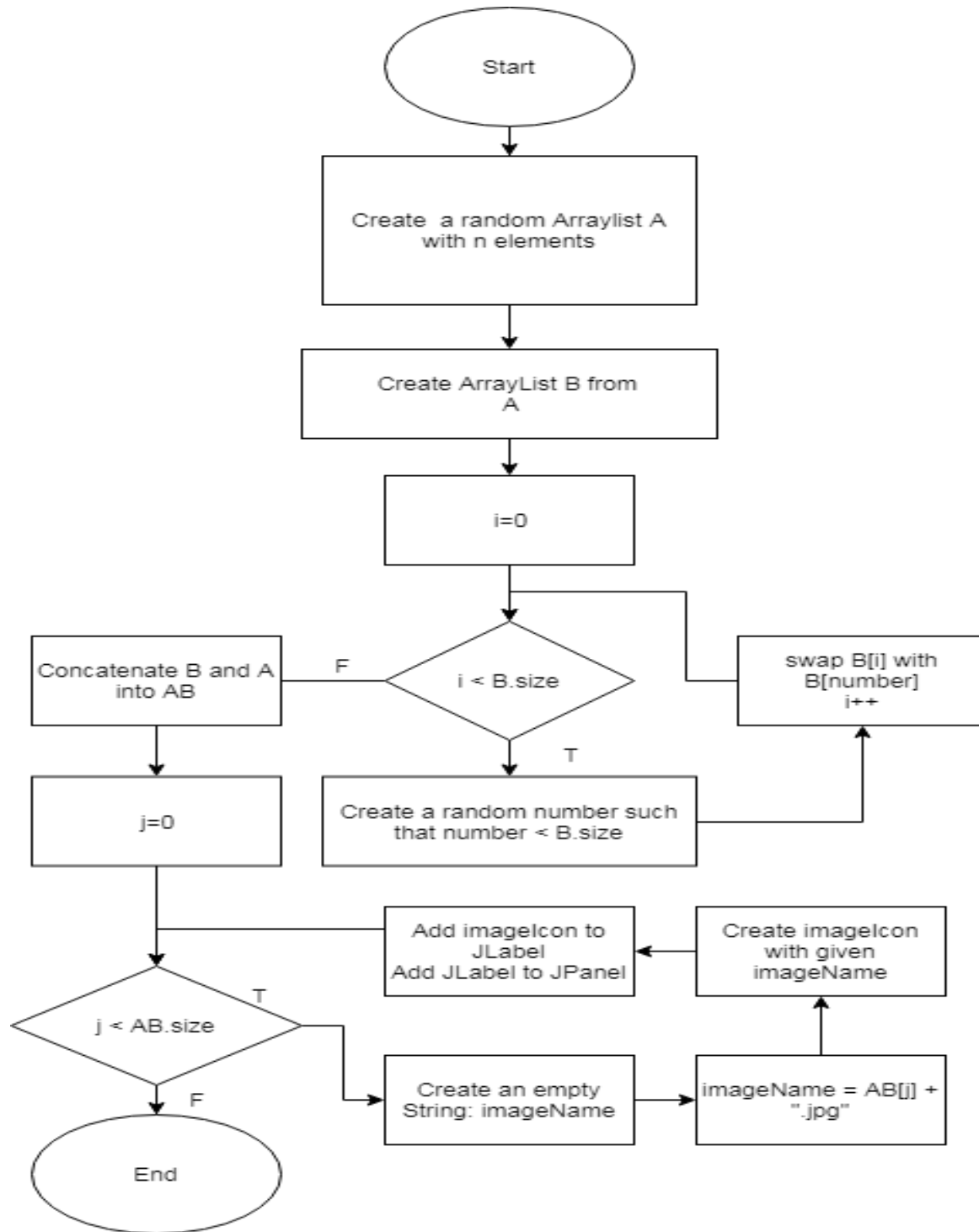


FIGURE 9 CREDITS

VI. Execution Flow

1. Algorithm Diagram





VII. Maintenance and Updating

Maintenance:

- Official project will be stored mainly on our group's chat box on facebook
- We also back up our project to other cloud services like Google Drive, OneDrive every week.
- Functions that are under coding will be stored on group's members devices.

Updating:

- There are three kinds of update: Big ones, small ones and patches.
 - Big updates: new function(s) or big changes in algorithms.
 - Small ones: include UI update or patches.
 - Patches: bugs fix.
- Our official project will be updated whenever a new version released.
- New functions will only be added to main project when it's has been tested carefully by our group's testers.

VIII. Check List

Assignment	Member	Actual Start Time	Estimate time to finish (hrs)	Actual End time	Work hours	Note
Problem Definition	ThanhKH	13:30 20/05/2019	2	14:25 20/05/2019	1	Completed
Problem Definition	NhanDT	19:00 20/05/2019	2	20:00 20/05/2019	1	Review and Modify
User Requirement and System Requirement	BangNT	8:00 21/05/2019	4	11:00 21/05/2019	3	Completed
Analysis	ThanhKH	8:00 22/05/2019	12	18:00 22/05/2019	10	Completed
Book cover design and Group logo design	ThanhKH, NhanDT, BangNT	8:00 23/05/2019	12	22:00 23/05/2019	14	2hrs late
Basic GUI Design	ThanhKH, NhanDT, BangNT	8:00 24/05/2019	18	22:00 24/05/2019	14	Completed
Cards & Themes Design	ThanhKH, BangNT	8:00 25/05/2019	16	22:00 25/05/2019	14	Completed

Algorithm Diagram	NhanDT	8:00 27/05/2019	5	12:00 27/05/2019	4	Completed
Normal Mode & Subclasses Coding	ThanhKH	8:00 29/05/2019	48	23:50 30/05/2019	32	Completed
Custom Mode Coding	ThanhKH	8:00 31/05/2019	8	14:00 01/06/2019	6	Completed
Player Management Class & Log in Function Coding	NhanDT	8:00 31/05/2019	24	20:00 31/05/2019	12	Completed
Leaderboard Function Coding	NhanDT	8:00 01/06/2019	12	8:00 03/06/2019	36	24hr late
Themes Function Coding & Credits Design	BangNT	8:00 01/06/2019	8	14:00 01/06/2019	6	Completed
Detail GUI Design (Except Leaderboard)	ThanhKH, BangNT	8:00 02/06/2019	24	0:00 03/06/2019	16	Completed
Detail GUI Design (Leaderboard)	ThanhKH, NhanDT	8:00 03/06/2019	4	12:00 03/06/2019	4	Completed

Testing & Debugging	ThanhKH, BangNT	8:00 04/06/2019	12	20:00 04/06/2019	12	Completed
Document Finishing	BangNT, NhanDT	10:00 06/06/2019	4	12:00 06/06/2019	2	Completed
Presentation	NhanDT	14:00 14/06/2019	1	14:30 14/06/2019	0.5	Completed & Presenter changed
Implementation	BangNT, NhanDT	8:00 15/06/2019	3	10:00 15/06/2019	2	Completed