FEASIBILITY STUDY

1. OVERVIEW

The application to be developed is a fully functional, personalized version of the popular game, Minesweeper. Similar to the original game, the objective is to clear the board by finding all hidden mines without exploding them. The mines can be discovered using clues near its surrounding tiles that indicate the number of mines around it. Additionally, discovering safe areas with no mines around shall uncover adjacent areas and display a blank tile.

However, in this personal adaptation of Minesweeper, the player must avoid finding mines that are scattered around the board. As the player navigates through the board, they can flag possible mines to prevent falling into them. While there are no consequences for flagging areas that are not dangerous, the player has a limited number of flags. In order to win the game, the player must uncover all safe zones or flag all mines.

In addition to fantasy-themed graphics and visuals, the player will have the option to choose a level of difficulty. The easiest mode will feature a 10 x 10 grid with 10 mines and 15 flags, the normal mode will consist of a 16 x 16 grid with 20 mines and 20 flags and finally, the expert mode will have a 30 x 20 grid with 30 mines and 15 flags. Additionally, the player can restart the current game at any time and track their scores for each game.

The design of the game's interface and its mechanics is modelled for single player use. Moreover, the potential user base is relatively narrow as the application is not hosted by any online platforms and players may be skeptical of downloading individual components.

2. ANALYSIS OF RISKS AND CONSTRAINTS

2.1 USER EXPERIENCE

As the application is not hosted by any online platforms, it requires users to have previously installed the NetBeans IDE Version 8.2 or more, Java version 1.8.0 or more and all related images, files and software code. Additionally, the complex nature of the game requires a basic understanding of the original game and primary logic and deduction skills. For a novice player, it can be a difficult playing experience and could require significant amount of time to learn on their own. Thus, to ensure all pre-requisites are satisfied and allow a better gameplay, the game's mechanics and the list of resources required shall be provided in the introduction screen. Furthermore, the application will be marketed as a single-player game for players 10+.

2.2 FINANCIAL COSTS

The work devoted in creating this application is a "public service" and thus, no profits are made or retained by its developers. Moreover, the game is built on open-source, freely available softwares and can run without an internet connection if all components are installed. There are no costs incurred when creating this game.

2.3 DEVELOPMENT OF APPLICATION

While the application is built on the developer's existing knowledge and no additional research is required, there is a limited time available for the developer to build and test all features. Given the limited time, there is no room for delays or setbacks and finishing this project will require a strict adherence to personal deadlines.

3. END-USER REQUIREMENTS

While no official interview took place, there were certain specifications for the given task. In addition to the application, there had to be a user guide that explains the game mechanics and a list of required hardware and software to run the game. The application, itself, should also have an introduction and game over screen.

4. STATEMENT OF WORK (SOW)

4.1 RESOURCE LIST

In order to run the application, the user must install NetBeans IDE Version 8.2 or more, Java version 1.8.0 or more and all related images, files and software code. Additionally, there is a user guide to help understand how to play the game.

4.2 GANTT CHART

PROJECT TITLE	Minesweeper: Fantasy Edition
PROJECT MANAGER	Prachee Nanda
COURSE	ICS4UE-21
DATE	Saturday, August 22, 2020

GANTT CHART					PROPOSAL	FEASIBILITY STUDY		PROJECT DEVELOPMENT			TESTING
TASK	TASK	START	DUE	DURATION (IN HOURS)	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
1	Project Proposal										
1.1	Scope Document	08/19/20	08/19/20	4							
2	Feasibility Study										
2.1	Problem Definition and Analysis	08/20/20	08/20/20	4							
2.2	End User Requirements	08/20/20	08/20/20	4							
2.3	Software Project Plan	08/20/20	08/21/20	16							
2.3.1	Resource List	08/20/20	08/20/20	4							
2.3.2	Gantt Chart	08/20/20	08/21/20	4							
2.3.3	Flowchart/UML Diagrams	08/20/20	08/21/20	8							
2.4	Review	08/21/20	08/21/20	12							
3	Project Development										
3.1	Developing Opening/Game Over Screen	08/22/20	08/22/20	12							
3.2	Developing Minesweeper Game	08/22/20	08/24/20	60							
3.2.1	Create original version	08/22/20	08/23/20	36							
3.2.2	Create personal enhancements (e.g. graphics)	08/23/20	08/24/20	24							
4	Testing and Verification										
4.1	Test Software Program	08/24/20	08/25/20	24							

As shown in the above Gantt Chart, the four stages of the project are to be completed in a span of seven days. Each cell represents 4 hours, and the duration for each task is merely an approximation of the time it shall take to complete it. In order to allow flexibility, they have been staggered by a few hours but do not account for time spent in other activities e.g. sleeping, eating.

4.3 FLOWCHART

Figure 4.3.1: Game Start – this flowchart visualizes the logic for the opening screen of the game.

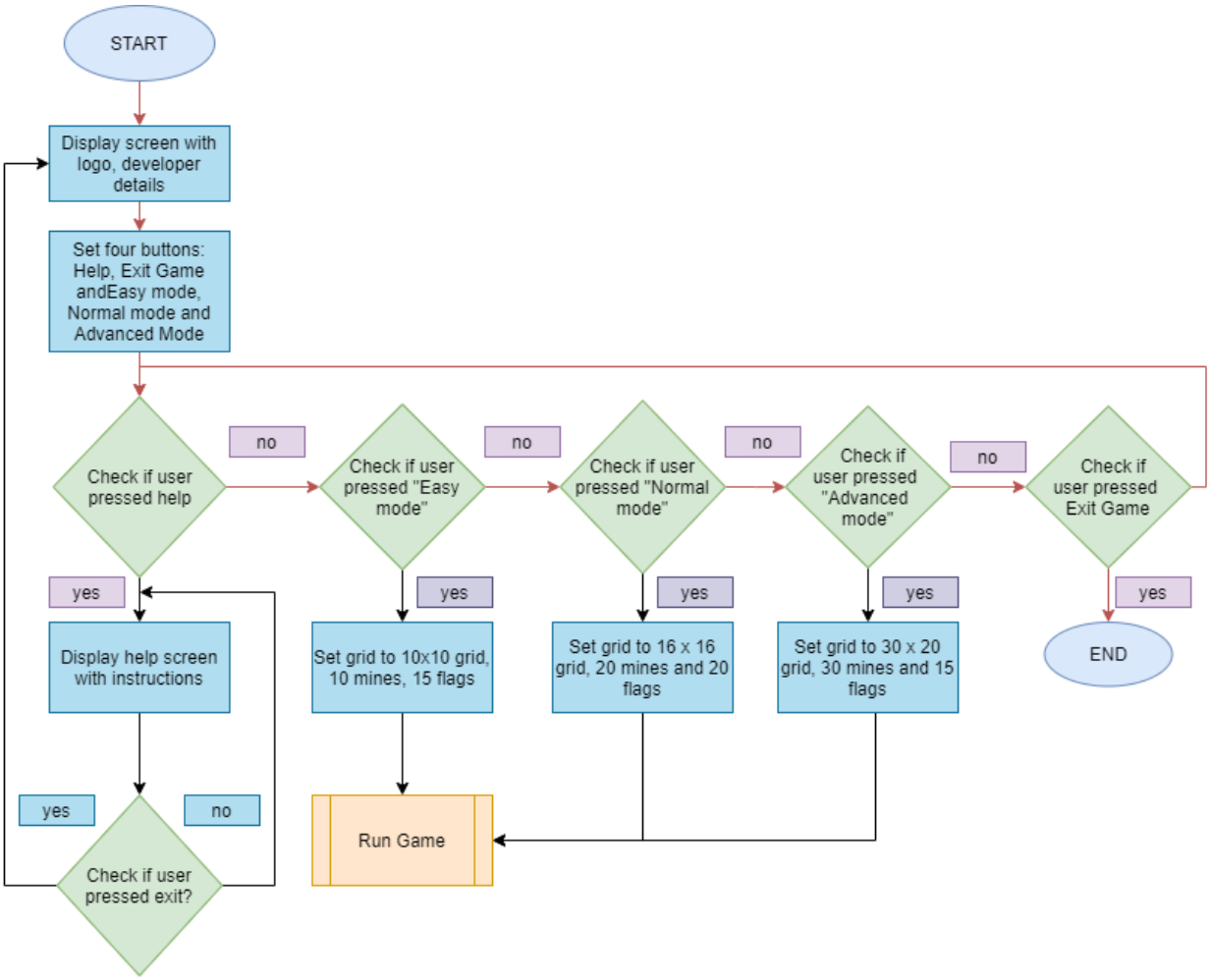


Figure 4.3.2: Run Game – this flowchart visualises the logic for the main application

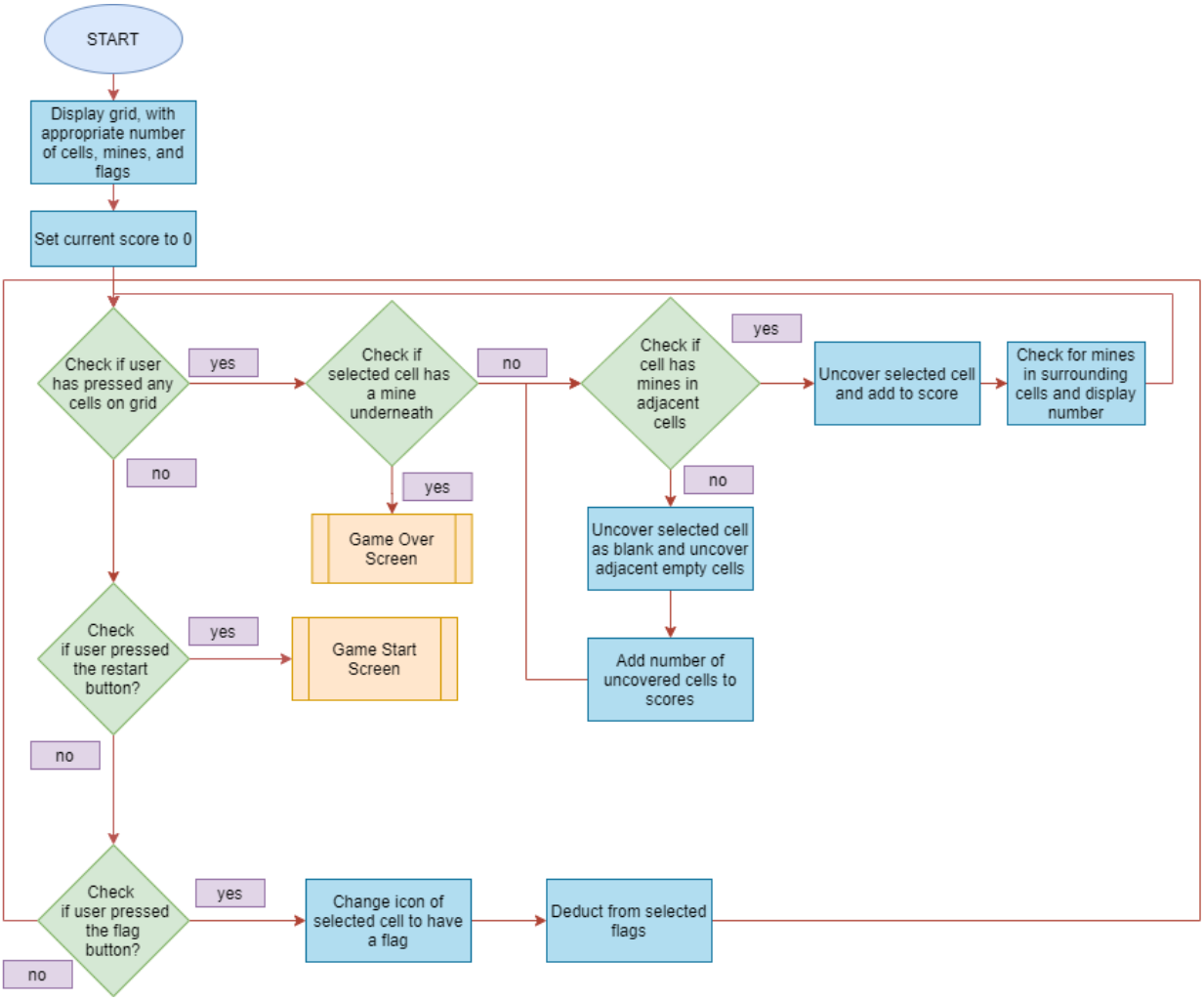
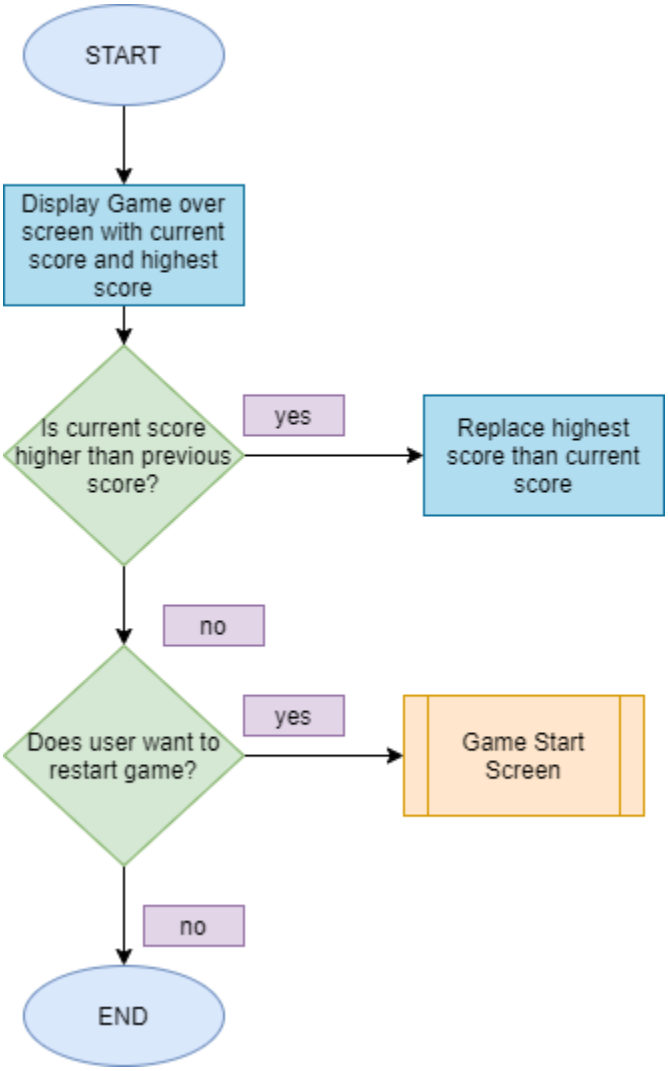


Figure 4.3.3: Game Over Screen – This flowchart visualises the closing screen of the game.



4.4 UML Diagram

Figure 4.4.1 This diagram visualises all the classes and instances of it.