# MineSweeper 3D

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03/08/2024

## Contents

# 1 Change History

Version: 1.00.00
Modifier: Isaiah Martinez
Date: 03/08/24
Description of Change: Build Project and released on Github. Documentation added. Updated Readme with instructions for installation and how to play.

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Version: 0.94.35
Modifier: Isaiah Martinez
Date: 03/08/24
Description of Change: Deleted unnused sound assets from unity store. Added music to game. Added Sound mechanics. Added ability to adjust volume within menu.

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Version: 0.88.80
Modifier: Isaiah Martinez
Date: 03/08/24
Description of Change: Added free sound assets from the unity store.

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Version: 0.83.25
Modifier: Isaiah Martinez
Date: 03/08/24
Description of Change: Adjusted bomb creation mechanics and assignment. Deleted stray logs to console.

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Version: 0.77.70
Modifier: Isaiah Martinez
Date: 03/07/24
Description of Change: Menu connectivity introduced. Quit button now functional. Mouse controls camera movement.

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Version: 0.72.15
Modifier: Isaiah Martinez
Date: 03/07/24
Description of Change: Added new panels representing several menus such as Pause Menu, Settings Menu, and Post-Game Menu. Displayed timer post-game completion.

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Version: 0.66.60
Modifier: Isaiah Martinez
Date: 03/07/24
Description of Change: Events added to Stopwatch. Changes affected Game Mechanics, Stopwatch, and UI Manager Script.

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Version: 0.61.05
Modifier: Isaiah Martinez
Date: 03/07/24
Description of Change: Stopwatch added.

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Version: 0.55.50
Modifier: Isaiah Martinez
Date: 2/21/24
Description of Change: Added a win condition to game logic. Adjusted Post-Game logic to accomodate the different states of the game finishing.

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Version: 0.49.95
Modifier: Isaiah Martinez
Date: 03/06/24
Description of Change: Updated design for the main menu.

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Version: 0.44.40
Modifier: Isaiah Martinez
Date: 03/06/24
Description of Change: Reviewed changes made to different menus. Removed unnecessary whitespace within the scripts.

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Version: 0.38.85
Modifier: Isaiah Martinez
Date: 03/06/24
Description of Change: Added Neighbor Revealing Logic when a 0 is discovered. Added ability to lose game. Added bomb locations upon creation.

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Version: 0.33.30
Modifier: Isaiah Martinez
Date: 03/06/24
Description of Change: Added Flag Mechanics to game. Added 3D Flag Elements to the Cell Prefab.

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Version: 0.27.75
Modifier: Isaiah Martinez
Date: 03/05/24
Description of Change: Modified the way the cells for the board were developed which utilized updated Cell Prefab.

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Version: 0.22.20
Modifier: Isaiah Martinez
Date: 2/28/24
Description of Change: Added ability to update size of board when clicking the different buttons on the main menu. Connected GameMechanics and UI Manager Script together via events. Now able to hide main menu when creating the board.

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Version: 0.16.65
Modifier: Isaiah Martinez
Date: 2/23/24
Description of Change: Added UI Manager Script to handle events with the menus.

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Version: 0.11.10
Modifier: Isaiah Martinez
Date: 2/21/24
Description of Change: Created Outline of Prefab used for Cells within board. Added Basic Input Script to allow for camera movement with key presses. Added Game Mechanics Script to control the construction of the board. Added Cell Logic Script to describe the cells within the board.

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Version: 0.05.55
Modifier: Isaiah Martinez
Date: 2/21/24
Description of Change: Made Git repository and added Readme

# 2 Introduction

## 2.1 Background Information

This document describes the architecture, design, and implementation for the popular game MineSweeper. See Here for more information. The project was done in Unity and utilized the usage of several scripts as well as assets which are acknowledged within the Acknowledgements section at the end of this document.

The title for this project: **MineSweeper 3D** is named so due to the project utilizing 3D elements to construct the game. Each cell within the visible board is a 3D element which casts shadows and reflects light. Not all elements, however, within the game utilize 3D structures, e.g., the menus.

This project offers players a new take on the classic game of MineSweeper by expanding into the $3^{rd}$ dimension.

## 2.2 Project Information

This project addresses the interests of the major stakeholders including:

- The professor — wants a project that utilizes modern software development techniques, game design strategies, and smart application of the ideas discussed in class. Additonally, there is the desire for quality code design, precise implementation, and unambiguous documentation leading into the fulfillment of Software Development Tasks such as usability, reliability, etc.

- Players of the game — they want a functioning product with thoughtful insight into the design and playability of the game. The game should be as bug-free as possible. Furthermore, the game should be fun.

- The Developer — wants the code to be properly structured, commented, and legible. On top of maintaining high quality code, the elements within the various parts of the project not in code (those within the Unity Design Window) should also be held to the same caliber.

The design of this project is highly complicated and necessitates the documentation to descrbe the project from a variety of perspectives:

1. Logical View — components accompanied by their operations and attributes. Additionally, the relationships between the components amongst other components.
2. Process View — the processes that handle execution for components described in the Logical View
3. Development View — the larger scale view of the project including those described in the Process and Logical Views.
4. Use Case View — describe the end user interactions with the system. These serve as both a guideline for project construction as well as defining the user requirements.

### 2.3 Game Information

The Rules to play this game can be seen below in Figure 1. These are locationed on the publicly visible Github Repository seen here. Also located on the Github Repository is a ReadMe file which describes the process for downloading and playing the game for oneself.

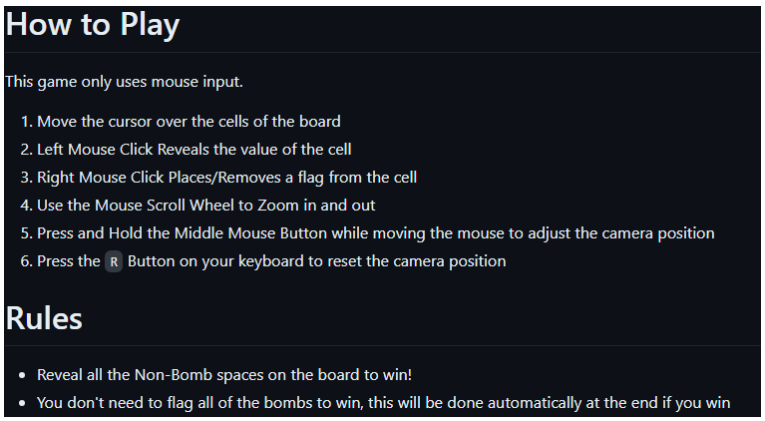


Figure 1: The rules of the game and how to play.

## 3 Design Goals

The design priorities for the game are as follows:

- The design should be efficient in space complexity. Additionally, the design should aim to be as simplistic, yet effective as possible. This is to reduce design complexity and maximize effort put forth in development.

- This project was developed by one person, so understanding the limitations of my own abilities was paramount when designing and implementing the game.
- Utilize the code given as an outline from the professor to further enhance the quality of the project.

# 4 System Behavior

The architecture description provided in this section

# 5 Logical View

# 6 Process View

# 7 Development View

# 8 Physical View

# 9 Use Case View

# 10 Reflection