VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama", Belgaum-590014

A Mini-Project Report

On

"MINESWEEPER GAME"

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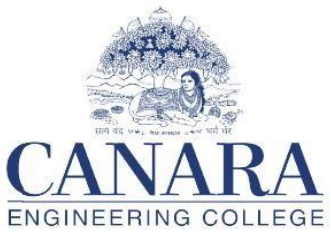

CERTIFICATE

This is to certify that the mini project work entitled “Minesweeper Game” is a bonafide work carried out by **Mr.Rithik K** bearing USN 4CB20IS042, **Mr.Rohan M Shetty** bearing **USN 4CB20IS043, Mr.Shriyan Sohan Sudhakar** bearing **USN 4CB20IS055** & **Ms.Shwetha Prabhu** bearing **USN 4CB20IS056**, the bonafide students of **Canara Engineering College** in partial fulfilment for the award of degree of Bachelor of Engineering in Information Science and Engineering under the **Visvesvaraya Technological University, Belagavi** during the year **2022-2023**. It is verified that all corrections/suggestions indicated for internal assessment have been incorporated in the report. The mini project report has been approved as it satisfies all the academic requirements in respect of mini project work prescribed by the Bachelor of Engineering Degree.

Project Guide	**Dr. Jagadisha N**
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ABSTRACT

Minesweeper is a popular single-agent puzzle video game with simple rules to play. Despite previous works that explored the complexity of the game and solving the games, limited works had been conducted to determine the reasons for its popularity and the underlying mechanisms for its entertainment values. This study is a unique take on the minesweeper game where the minesweeper attractiveness is investigated using the game refinement theory, which through the game progress model and success rate of the minesweeper game, the measures of motion in mind are derived. Such a measure has been applied to various configurations of the game, where the possible number of mines that maximizes different playing requirement of the player can be determined.

ACKNOWLEDGEMENT

A successful and satisfactory completion of any significant task is the outcome of valuable aggregate combination of different people in radial direction explicitly and implicitly. We have been lucky to have received a lot of help and support from our lecturers during the making of this mini project, we would therefore take the opportunity to thank and express our gratitude to all those without whom the completion of our mini project would not be possible.

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INTRODUCTION

Minesweeper is single-player logic-based computer game played on rectangular board whose object is to locate a predetermined number of randomly-placed "mines" in the shortest possible time by clicking on "safe" squares while avoiding the squares with mines. If the player clicks on a mine, the game ends. Otherwise, a number between 0 and 8 is displayed that identifies the total number of mines present in the eight neighbouring squares. Therefore, finding a square containing "8" indicated that all eight adjacent squares contain mines, while if a zero (displayed as a blank) is uncovered, there are no mines in the surrounding squares. A square suspected of containing a mine may be marked with flag.

1.1 PROBLEM STATEMENT

Create a Minesweeper game in Python. This is an interactive problem. Interactive problems differ from classic problems in that your solution will send and receive data from a special judge program instead of from static files.

1.2 OBJECTIVE

- Learn more about the game
- Show your algorithmic skills
- Make games more exciting
- Earn bragging rights with your friends and colleagues

CHAPTER 2

METHODOLGY

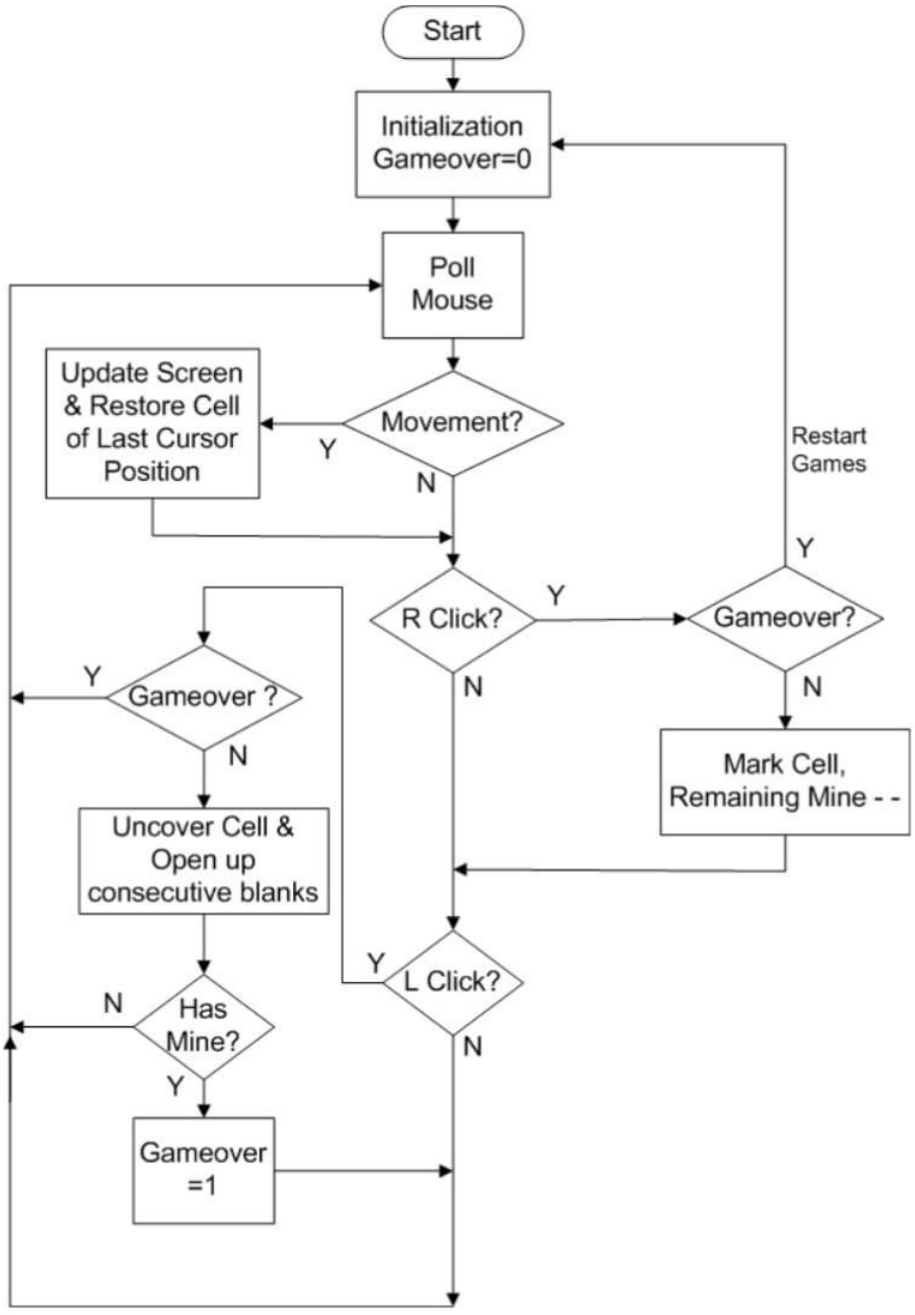
The goal of Minesweeper is to "complete" the board as fast as possible. The board is complete once all the clear squares are revealed (not all the mines need be marked as is sometimes thought). So the goal is really just to click open all the clear squares. But marking mines, of course, helps us figure out which are the clear squares.

So the solution is to properly interleave marking phases with clearing phases. Here are some possibilities:

The mass production strategy is to first mark all the mines you can without any further openings, and then to do all the openings you can without any further mine-marking. Pro: cascade openings happen more often and the number of required clicks is minimized. Con: your mind can't cache the section of the map you're working on. Con: you have to move the mouse a lot.

The sprint strategy is to do one clear move and then one mark move. Pro: mouse movement is minimized. Pro: easy to mentally cache the section of the map you're working -- leads to more deep moves. Con: cascades rarely happen so the number of clicks required is larger.

2.1 FLOW CHART



CHAPTER 3

RESULTS

- **Home page**

  This is the home page of the Minesweeper game as shown in Fig 3.1

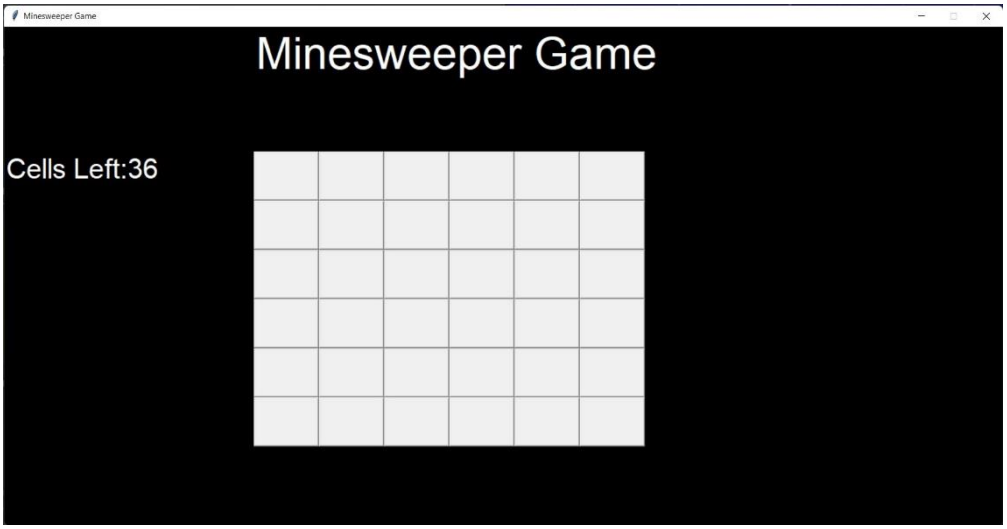


Fig 3.1

- **Game in process**

  The blocks are clicked such that the mine is not encountered.

  Algorithm is used for best course of action. The game in progress is shown in Fig 3.2.

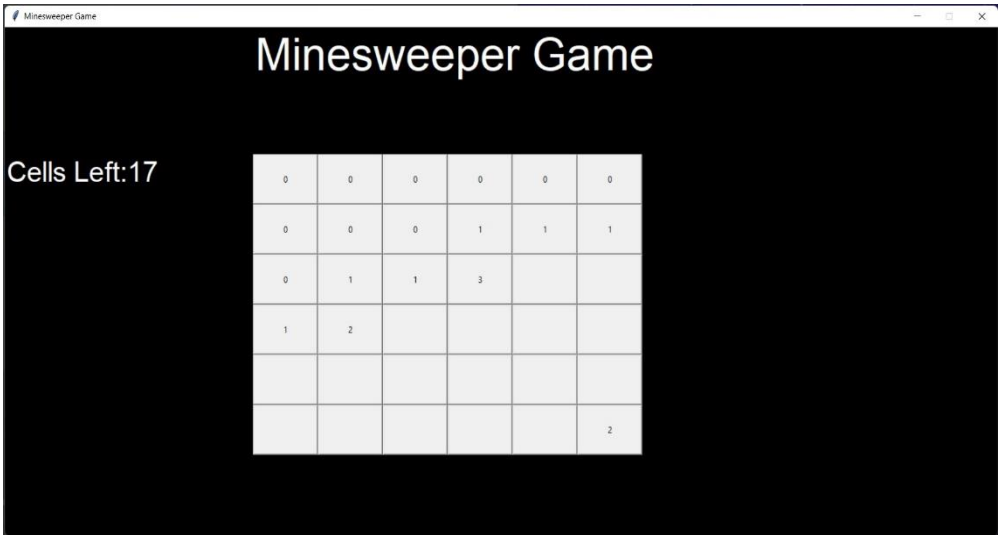


Fig 3.2

- **Mine encountered**

  Once a mine is clicked upon, the game finishes and one can replay the game. The alert message is shown in Fig 3.3.

Fig 3.3

CONCLUSION

In the game, the job is to locate all of the bombs without exploding one since the game ends when that happens. It is a fun filled game to play and requires some algorithms and based on one's course of action, one can win the game.

Thinking of the game as a part of a bigger educational process is really in the core mind-set that this project wants to promote. Games can do many things very well, but they certainly cannot do everything at once. Especially not without solid supporting structures around them. Throughout the project and the case studies we built this was true. As each teacher build her or his story these processes were discussed and reflected upon and we will be referring to these and link back to them.

This project aimed as much at using alternative and innovative methods to teach through coding digital games and playing games as part of learning, as at developing the skills of teachers in extending academic goals to understand, support and include the whole child: not only their academic subject skills but also social, emotional and behavioural skills.

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