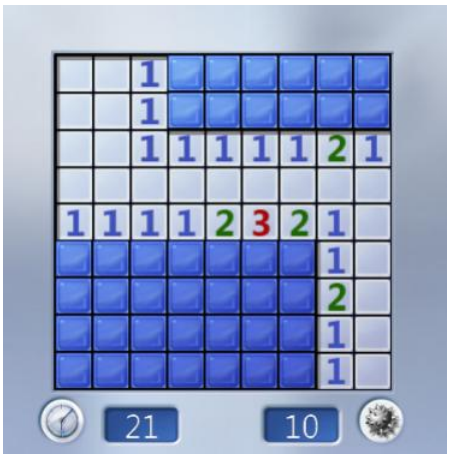
Sprint 1 Challenge

Mine Sweeper

Preface

Let's create a super version of the **Minesweeper game**,

First, play the game a little bit, get to know it and relax



Software Delivery Phases - Instructions

In this sprint **we work alone**, we code our own solution and bring our own knowledge and tools - please respect the rules.

Delivery is done through github

We will have 4 delivery points:

1. *1st delivery:* *Tuesday 21:30*
2. *2nd delivery:* *Thursday 21:30*
3. 3rd delivery: Saturday 21:30
4. Final delivery: Sunday 21:30
   The sprint score will be determined by this delivery – please do your best to have a working game
5. *Bonus (optional)*: Tuesday 21:30
6. *Presentation:* Wednesday 17:30
   We'll review each project, highlight the key features, and wrap it up with some spirited cheers and kudos from everyone!

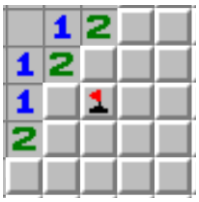
Minesweeper – Basic intro

The goal of the game is to uncover all the cells that do not contain mines without being "blown up" by clicking on a cell with a mine underneath.

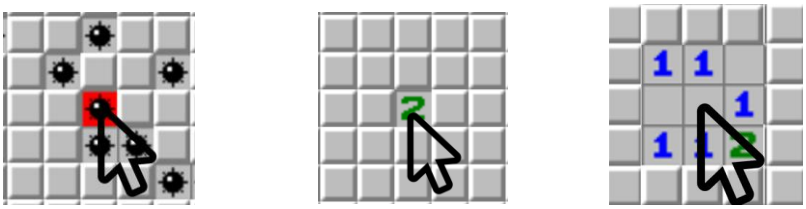
Our Minesweeper basic functionality is based on the reference game

Functionality and Features

- Show the board
- Left-click uncovers the cell's content
  - The cell may contain a mine (bomb)
  - Or it can be a safe cell
- Right-click flags/unflags a (suspected) cell



- Game ends when:
  - Clicking a mine - all the mines are uncovered (User lost)
  - All the mines are flagged, and all the other cells are uncovered (User's victory)
- When left-clicking on a cell, we uncover it and then:
  - Cell with a mine – uncover all the mines and end the game
  - Cell that has some neighbors that are mines – show the number of mines
  - Cell that has no mines in his neighbors – also expand to uncover it's 1st degree neighbors



- Support 3 levels of the game
  - Beginner (4 * 4 with 2 MINES)
  - Medium (8 * 8 with 14 MINES)
  - Expert (12 * 12 with 32 MINES)

Development - Tips and Guidelines

Here are some initial global variables:

gBoard – A Matrix containing cell objects:
{
minesAroundCount: 4,
isCovered: true,
isMine: false,
isMarked: false
}
	The model

gLevel = {
SIZE: 4,
MINES: 2
}
	This is an object by which the board size is set (in this case: 4x4 board and how many mines to place)

gGame = {
isOn: false,
coveredCount: 0,
markedCount: 0,
secsPassed: 0
}
	Holds the current game state:
	isOn: true when game is on
	coveredCount: How many cells are covered
	markedCount: How many cells are marked (with a flag)
	secsPassed: How many seconds passed

As a guideline, here are some initial functions that we suggest:

`onInit()`	Called when page loads
`buildBoard()`	Builds the board Set some mines Call `setMinesNegsCount()` Return the created board
`setMinesNegsCount(board)`	Count mines around each cell and set the cell's **minesAroundCount**.
renderBoard(board)	Render the board as a <table> to the page
`onCellClicked(elCell, i, j)`	Called when a cell is clicked
onCellMarked(elCell)	Called when a cell is right-clicked See how you can hide the context menu on right click

`checkGameOver()`	The game ends when all mines are marked, and all the other cells are uncovered
`expandUncover``(board, elCell, i, j)`	When the user clicks a cell with no mines around, uncover not only that cell, but also its neighbors. NOTE: start with a basic implementation that only uncovers the non-mine 1st degree neighbors BONUS: Do it like the real algorithm (see description at the Bonuses section below)

Development – How to start?

Breaking-down the task to small tasks is a key success factor.
In our case – we recommend starting from the following steps:

Step1 – the seed app:

1. Create a 4x4 gBoard Matrix containing Objects.
2. Set 2 of them to be mines.
3. Present the board using **`renderBoard()`** function.

Step2 – counting neighbors:

1. Create **`setMinesNegsCount()`** and store the **`minesAroundCount`** property in each cell
2. Update the **`renderBoard()`** function to also display the neighbors count and the mines

Step3 – click to uncover:

1. When clicking a cell, call the **`onCellClicked()`** function.
2. Uncover the cell.

Step4 – randomize mines' location:

1. Add some randomicity for mines locations.

2. After you have this functionality working– it's best to comment the code and switch back to static location to help you focus during the development phase

Step5 – Upload initial game

1. Add a footer with your name
2. Upload to git

UI Guidelines

This sprint is not a UI-centered project, however, do your best to make it look nice

Further Tasks

First click is never a Mine

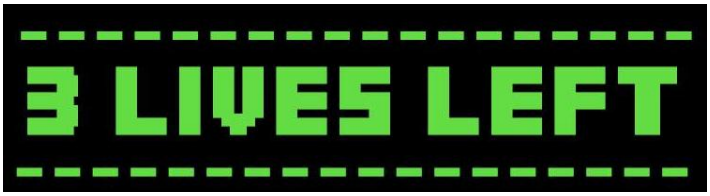
The first clicked cell is never a mine

HINT: We need to start with an empty board (no mines) and then place the mines and count the neighbors only on first click.

Lives

Add support for “LIVES” -

The user has 3 LIVES:



When a MINE is clicked:

- There is an indication to the user that he clicked a mine
- The LIVES counter decreases
- The cell is covered
- The user can mark it and continue playing

The Smiley button

Add the smiley button - clicking the smiley resets the game
here are some smiley states:

- Normal 😀
- Sad & Dead – LOSE 😵 (stepped on a mine and have no life left)
- Sunglasses – WIN 😎

Bonus Tasks

Add support for HINTS

The user has 3 hints

When a hint is clicked, it changes its look, example: 

Now, when a (covered) cell is clicked, the cell and its neighbors are uncovered **for 1.5 seconds**, and the clicked hint disappears.

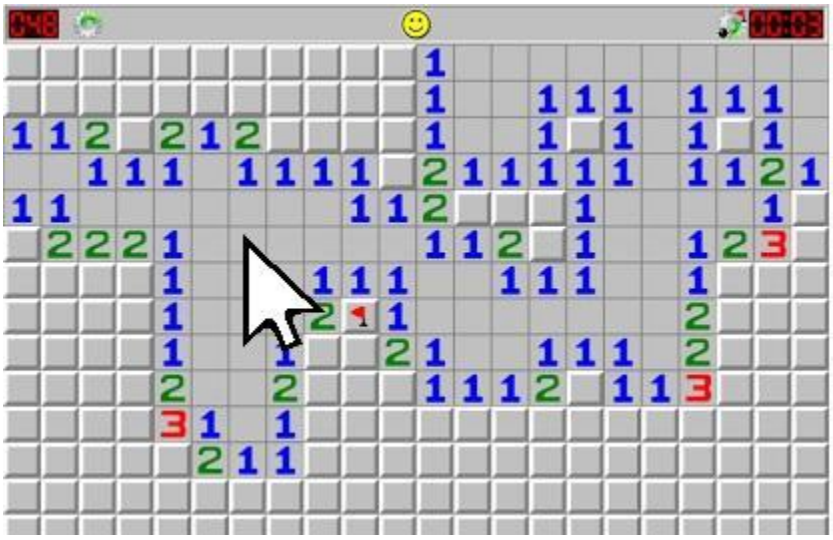
Best Score

Keep the best score in local storage (per level) and show it on the page

Full Expand

When a cell that has no mines in his neighbors is clicked – uncover the cell and also expand to all his neighbors in a recursive way.

Here is an example:



Think about a recursion.

Safe click

The user has 3 **Safe-Clicks:**

Clicking the **Safe-Click** button will mark a random covered safe cell (for 1.5 seconds) so the user knows that he can safely click that cell.

Dark Mode

The user should be able to toggle between Dark-Mode and Light-Mode

Undo

Add an “UNDO” button, so the user can undo (some of) his moves

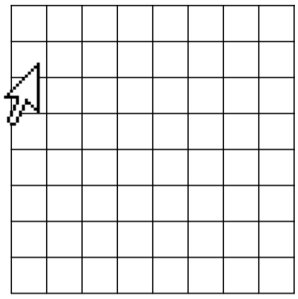
Manually positioned mines

Create a “manually create” mode in which the user first positions the mines (by clicking cells) and then plays.

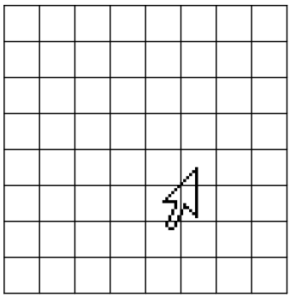
MEGA HINT

Mega-Hint works only once every game. It is used to uncover an area of the board for 2 seconds. Functionality description: (1) Click the “Mega Hint” button (2) then click the area’s top-left cell (3) then click bottom-right cell. The whole area will be uncovered for 2 seconds.

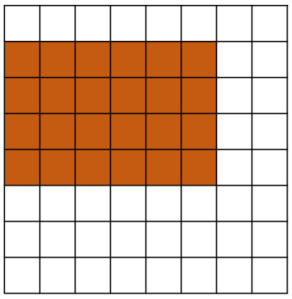
Step1: Click the Mega-Hint button



Step2: Click the area’s top-left corner



Step3: Click the area’s bottom-right corner



Result: the selected area’s content will be revealed for 2 seconds

MINE EXTERMINATOR

Clicking the “Exterminator” button, eliminate 3 of the existing mines, randomly. These mines will disappear from the board.

Re-calculation of neighbors-count is needed

אזהרה – הספרינט הזה ייקח אותך רחוק משחשבת