Minesweeper – Is it a game of luck?

Minesweeper is a single-player logic game. In this game, a grid is equally divided into multiple square-like cells. A number in the cell indicates an exact number of mines in the adjacent or surrounding cells. Using the number in the cell, the player must logically determine which cells are safe and which contain a mine. Once you open all the safe cells, you win the game; otherwise, since it's a game, you can always start over.

Let's play

Below are the instructions on how to play Minesweeper strategically:

1. Select a play mode

Open the game and select one of the play modes as listed in Table 1.

Table 1: Minesweeper play modes

Mode	Grid size	Number of tiles	Number of mines
Easy	9x9	81	10
Intermediate/Medium	16x16	256	40
Expert	30x16	480	99
Custom	30x24*	720*	667*

*Maximum support provided on Windows 10 (August 2021)

Note: Based on your game vendor, these options may differ in terms of name or grid size.

2. First left-click

Left-click on any cell and you will experience one of the following scenarios:

a. A section with numbered cells and empty spaces opens up (Figure 1).

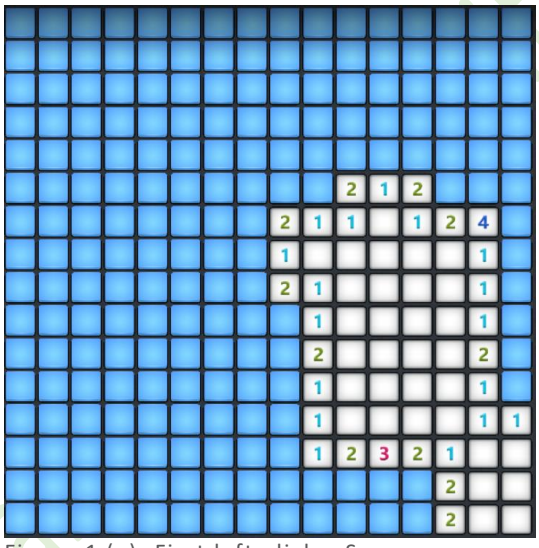

Figure 1 (a): First left-click – Space opens

b. You uncovered only one numbered cell and no surrounding cell opens up (Figure 2).

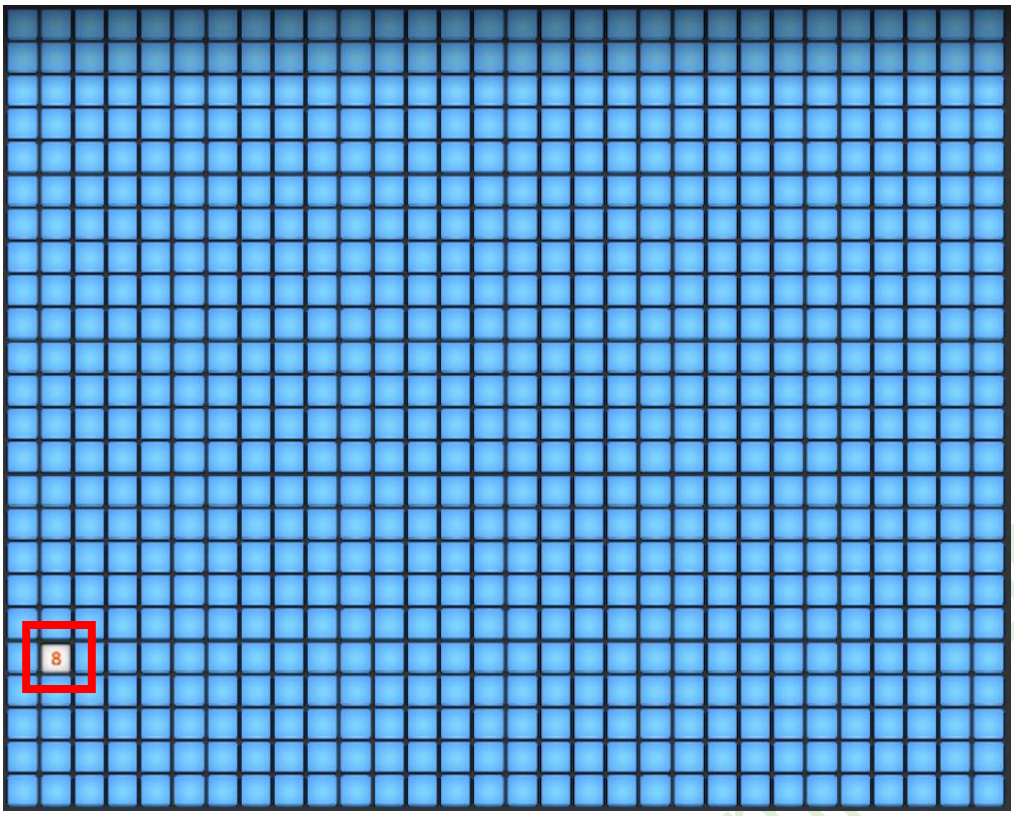

Figure 2: Uncover one numbered cell

c. You accidentally hit a mine on the first click. Although this is a rare event, it can happen when the number of cells with mines are more than the number of cells with numbers or you play the same board after losing a game and hit a mine. Figure 3 displays a custom grid (30x24) with 720 tiles and 667 mines. In such a case, you can always start over.

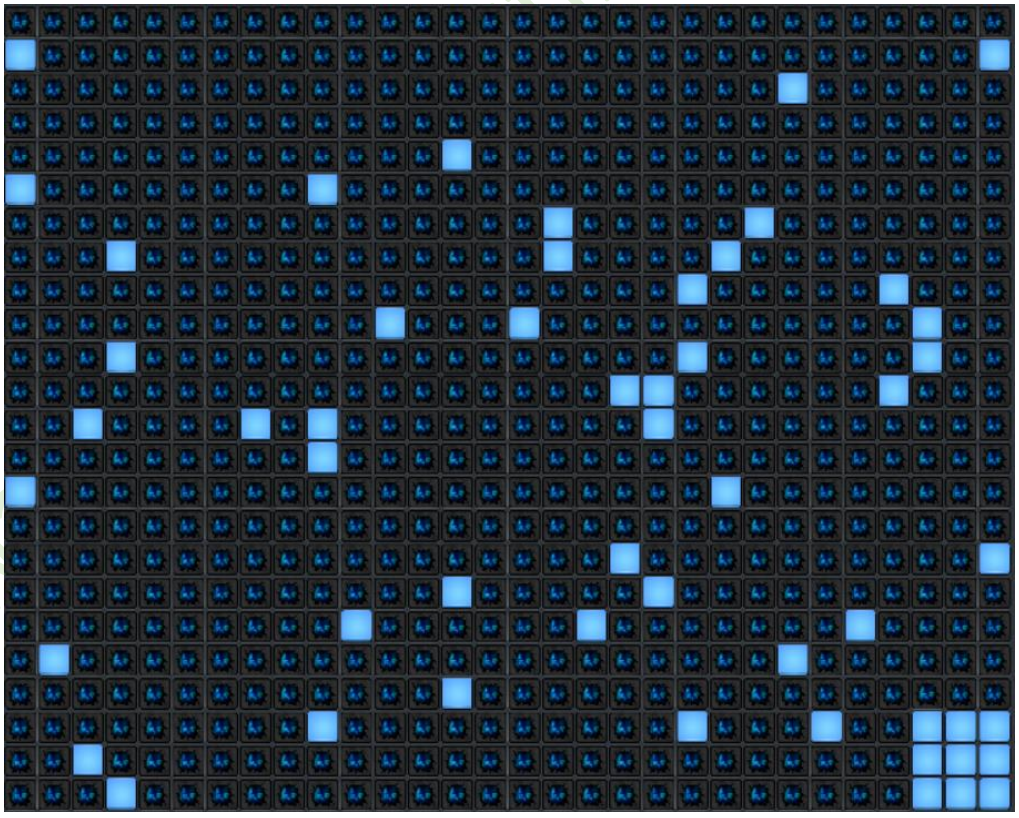

Figure 3: Hit a mine on the first click

3. Gameplay begins

Each number indicates the number of mines in the adjacent or surrounding cells. The surrounding cells are the cells that are directly above, below, to the right, left, diagonally up, and diagonally below the numbered cell. Based on this information, uncover the safe cells and flag the mines. To identify the surrounding cells of your numbered cell, see Figure 4.

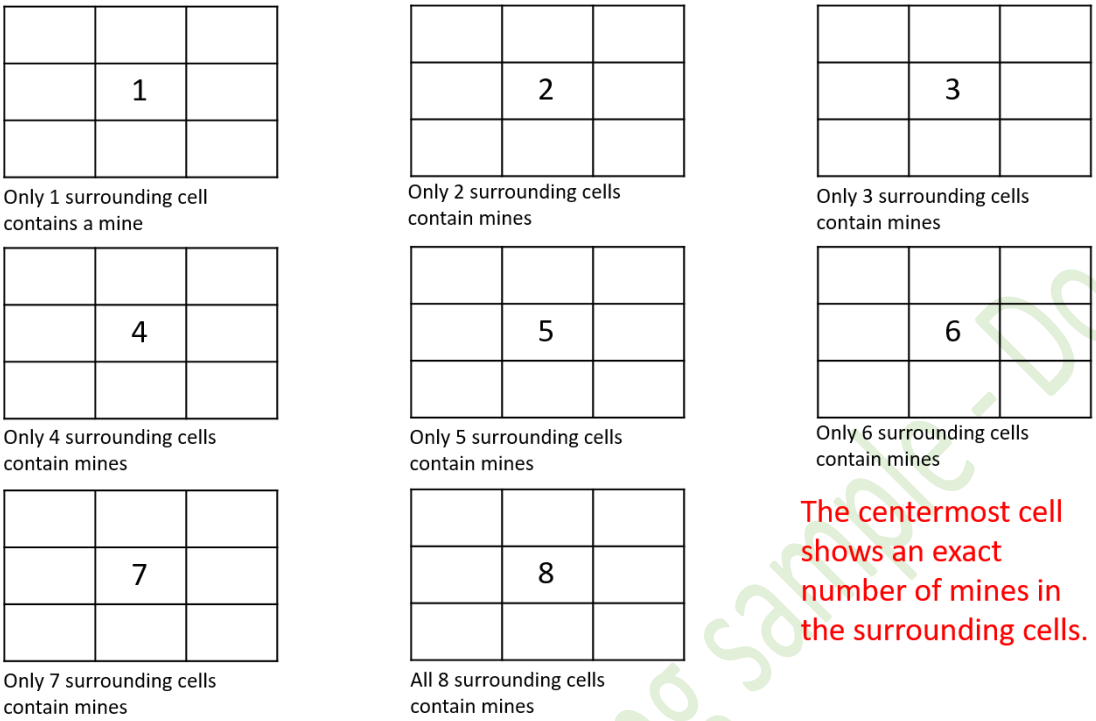

Figure 4: Surrounding cells

Once you have flagged all the mines touching the numbered cell, do not flag any more mines around this number. Before you flag any mine, reevaluate the safe cells and the number of flagged mines, if any.

The best way to start or improve your game is to focus on recognizing the patterns, both elementary and advanced. The following sections cover both.

Recognizable elementary patterns

1. When the numbers are in corners or at the edge of the grid, it becomes easier to flag the mines and identify and uncover the safe cells. For example, in Figure 5 (a), the *1* is at the edge and there is only one cell that touches *1*. Therefore, **right-click** and flag these locations (highlighted in red). Note that all the cells with number *1* will touch only one mine in the surrounding cells. This way you can uncover the other rest of the surrounding cells (highlighted in yellow).
2. In the image 5(b), the cell with the bottommost *2* touches only two adjacent cells (red). Therefore, right-click and flag these cells. Likewise, in the image 5(c), the cell with number *3* touches only three adjacent cells. Note that you can see the same pattern in a horizontal fashion as well.
3. In all the cases, always start with *1* and you will identify easy patterns for other numbers. In the image 5(d), the *4* (immediate right of *2*) already has one flagged mine (alongside *1*). For the other three mines, it touches only three cells (red) where you can flag the mine.

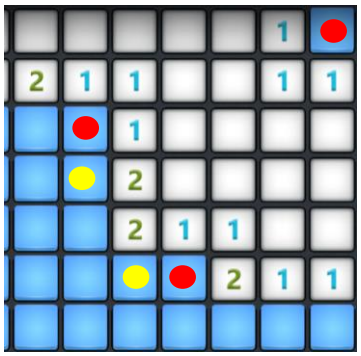

Figure 5(a): Elementary pattern

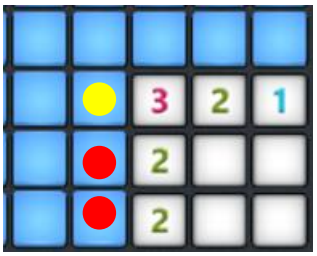

Figure 5(b): Elementary pattern

Figure 5(c): Elementary pattern

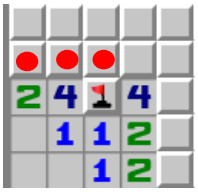

Figure 5(d): Elementary pattern

Advanced patterns

1. The 1-2-1 pattern is one of the most common advanced patterns. For example, if your pattern is similar to that in Figure 6(a), flag the mines under both the *1*s. This is because there can only be one mine that touches the *1*.

Figure 6(a): Advanced pattern 121

2. The 1-1-1-1-1 pattern will always have the mine in the middle *1*. For example, see Figure 6(b).

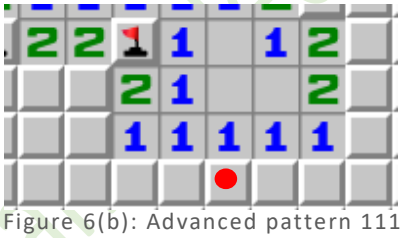

Figure 6(b): Advanced pattern 11111

3. In the 1-2-2-1 pattern, flag both the mines against the *2*s, as shown in Figure 6(c) below.

Figure 6(c): Advanced pattern 1221

Note: You will find a multitude of patterns in this game. However, while solving, all the patterns deduce to one of elementary or advanced patterns.

Chording

- If you have flagged all the mines adjacent to a number, double-click that number and it will open up the other safe surrounding cells. This way you can save time and improve your finish time. For example, in Figure 7, since *2* is already surrounded by two mines, double-clicking on the outer *2* will open the adjacent safe space.
  Note: The motive of this game is not to flag all the mines but to open all the safe cells.

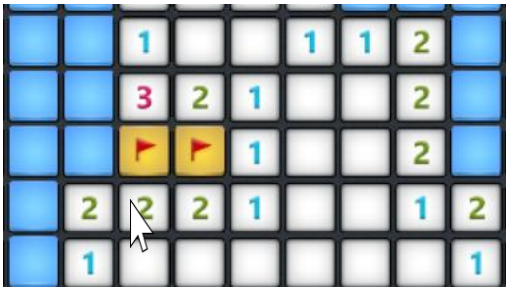

Figure 7: Chording

- To improve your finish time even more, you should only open the safe cells. This method is called **No Flags** (**NF**). However, this way you will be unable to practice chording as it does require you to flag the mines.

- The most efficient way is to combine these options. For example, in Figure 7, you can avoid to flag the mine near the corner-most *2* (and *1*). You can flag the mine in the outer *2* (just above the cursor) and practice chording to open the safe cells.

Guessing

Under unavoidable circumstances, you might need to make a guess. The best way is to check the number of mines left and play logically. Below is an example (Figure 8) of how you can navigate yourself through such a situation.

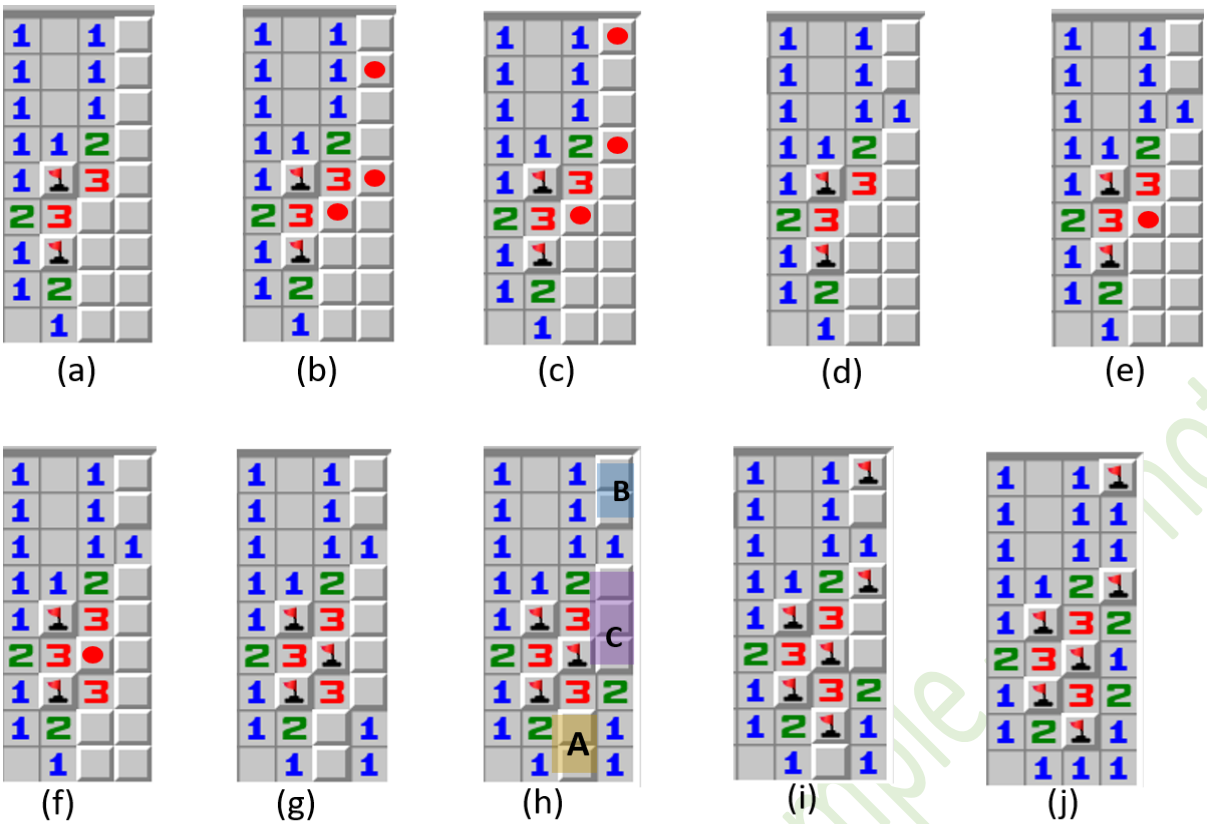

Figure 8: Guessing

1. In Figure 8(a), it is a tricky situation. There could be either of the two scenarios, as depicted in the images (b) and (c).
2. From these solutions, we can deduce that the third *1* from the top (image (d)) will always be a safe cell.
3. From images (e) and (f), we know that *1* can have the mine in either of its adjacent cells. Therefore, the cell that is diagonally above *2* has to be a safe cell.
4. Next, left-click the cells next to the cells that you know could be mines. In image (g), we clicked the corner most cell and it was *1*.
5. Now, we have to flag three mines. As in image (h), there could be one mine each in the sections A, B, and C. Since the *2* between sections A and C already has one mine in an adjacent cell and is also adjacent to a cell in section A, the mine could only be in the top cell in section A (image (i)).
6. By the similar breakdown, we can flag other mines as in the image (j).