Background

To implement a classic tile-matching game called SameGame, which is arguably the precursor to more well-known tile-matching games such as Bejeweled and Candy Crush. It does not matter if you have not played any of these games, because the rules of SameGame are actually quite simple. In a game of SameGame, you are given a rectangular board filled with tiles of different colours, such as the one shown in Figure 1.

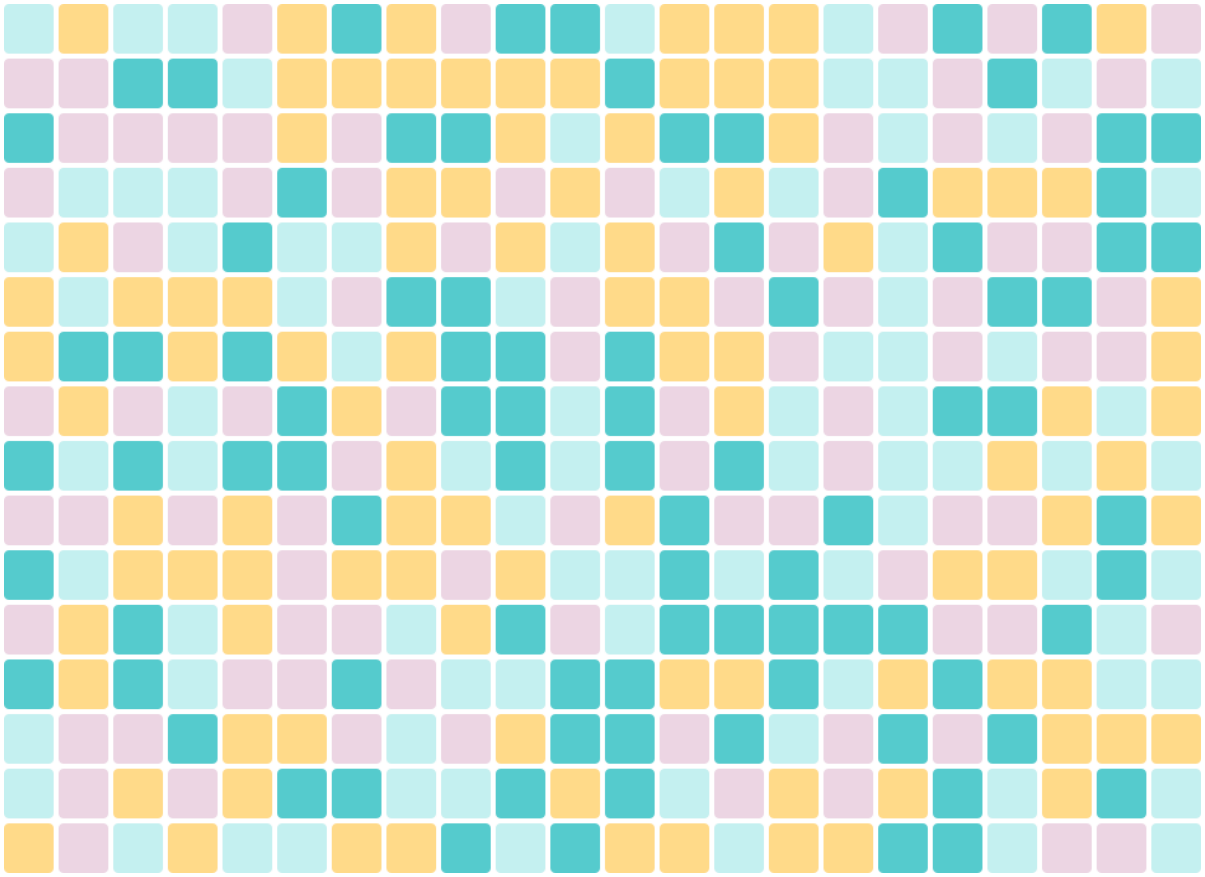

Figure 1: Example of a SameGame game.

The goal of the game is to remove as many tiles as you can from the board. A tile can only be removed if it is adjacent to another tile of the same colour, where adjacent here means either above, below, to the left, or to the right.

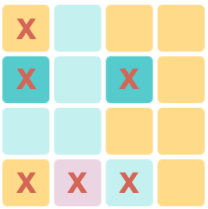

Figure 2: Example of a board with non-removable tiles (marked with a red cross).

For example, in Figure 2, the yellow tiles on the top-left and bottom-left corners are not removable since they do not have any adjacent tiles of the same colour. The same applies for the dark-green and purple tiles. The light-blue tile in the bottom row has a tile of the same colour nearby, but it is not adjacent, so it is not removable either. All the other tiles are removable.
When a tile is removed, all tiles with the same colour which are adjacent to it are also removed. For example, if we were to remove any of the yellow tiles on the third or fourth column, then every other yellow tile in those columns will be removed, because each of them are adjacent to a tile that is removed. You can see how this works in Figure 3.

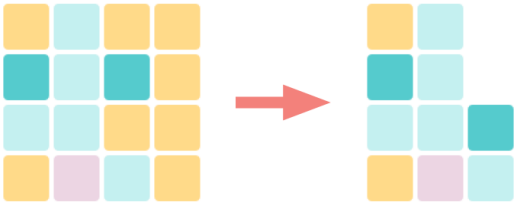

Figure 3: Example of removing a tile (a yellow tile in the third or fourth column).

Once a tile is removed from the board, any tile above it are no longer supported and will move down to take the empty space(s), as you can see with the dark-green tile in the third column. If we proceed by removing the light-blue tile in the first or second column, then the yellow and dark-green tiles on the top left corner will move down, as shown in Figure 4.

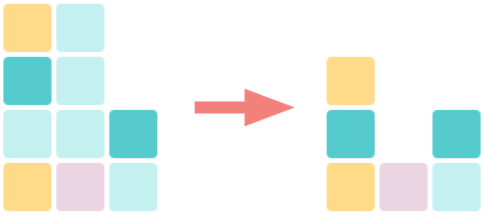

Figure 4: Removing the light-blue tiles after removing the yellow tiles.

At this point, the game ends because all the remaining tiles cannot be removed. A completely empty column (or columns) will be removed from the board and all columns to the right of the removed columns will shift to the left. You can see an example of this in Figure 5 after we remove the purple tiles, and then again after removing the light-blue tiles in the second column. Note that it is possible to remove multiple columns at the same time.
The player's score, given at the end of the game, is simply the number of tiles that were removed from the board, so if a player manages to remove 10 tiles, then the player's score is 10. If follows that the maximum score is the number of tiles at the beginning of the game, therefore a player can achieve the maximum score only if the player manages to remove all the tiles from the board.

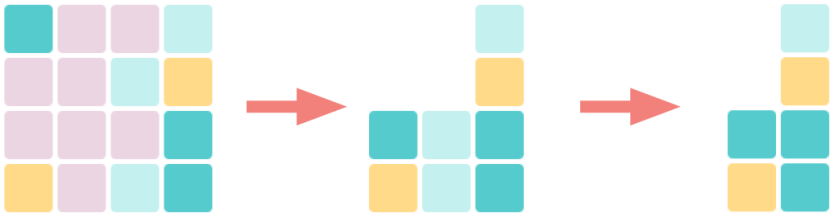

Figure 5: Removing purple tiles, followed by removing light-blue tiles.

In summary, here are the three main rules of the game:

Tiles can be removed when they are adjacent to other tiles with the same colours, and all adjacent tiles with the same colour are removed together as a group.
Tiles on the board will move down to take up any empty spaces below it (i.e. when we remove the tiles below them).
Columns with no tiles will be removed from the board, and the remaining columns to its right will take their place.

It is important to note that tiles will not move leftwards unless a column is completely empty, so you should always move a tile downwards first before moving it leftwards.

SimpleSameGame

There is a simpler version of the game with only one row, which I am going to refer to as SimpleSameGame. The implementation for SimpleSameGame is easier, which is why I had it written as a different class (more on this later).

Figure 6: Example of a SimpleSameGame game.

In this version, you do not have to worry about tiles falling down when it is no longer supported. Whenever a tile is removed, you simply have to move all adjacent tiles with the same colour (this is equivalent to removing a column in SameGame).