

## CS II Project

In the game design, we chose to implement 2 maps that differ in their structure, where we chose 0 to represent Empty land, 1 Clan castle, 2 Defense unit (cannon, archer tower, or wizard tower), and 3 Fence.

- We also added a feature in the game menu options that acts like a user guide to show a preview of the 2 maps' structures to the player to choose one of them before starting the game. He is also allowed to choose the defense unit he wants, whether cannon, archer, tower, or wizards.
- Also, the enemy troops and citizen workers are displayed as gif images to act as if they were destroying (for the enemies) or repairing (for the workers) the fences actually and not just touching them.
- Furthermore, the design of the menu is chosen to have 2 buttons where the user either can start the game at once and play with the default options or click the options button and choose his preferred settings then start the game.
- The 5 levels of the game are implemented with harder features for each level according to the level's difficulty.

### Extra features added:

- A 5-minutes timer of the game and a bar preview for castle health are displayed in front of the user while playing the game.
- The menu options for guiding the user and previewing the suggested map designs for him.
- Randomly generated gems during the game that allows the user to have an extra trial, if he lost before the timer ends, if he collected more than 3 gems while he plays.
- Randomly generated powerups that allow the player to revive his citizen works if died.
- A pause button is added to each level to allow the player to pause and resume the game whenever he wants to.
- Harder map structures are added to each level to increase the difficulty of the level so that no two levels have the same map structure.
- Larger enemy is added to levels with difficulty  $> 2$  that appears after 3 minutes of the level timer and has higher health and power than ordinary enemy.
- An earthquake that appears starting from the 4<sup>th</sup> level lasts for 4 seconds and decreases the health of the castle as well as damaging a fence.

- Code hierarchy:
- A separate class is created for each object (castle, defense, enemy, citizens, fence, gems, powerups, healthMarkers, largerEnemy, menu, settings, user guide, game-over window, winning window, pause window).
- One class is created to connect all the other classes together to let them all work at the same time once the game starts, which is the level class. The level is called in the menu class which is being initialized in the main so that once the game starts, all the functions and other classes run together. This level class has a difficulty member that changes the features of each level according to its difficulty.