

Contributions

I am responsible for both the game design and executing the game play mechanic. Since I am in charge of the game play, I am responsible for instance variables and behavior of the red blood cell object, the spawning mechanics of the red cell objects, stats generator, scoring, the different game modes and three of the available power ups in the game.

Red Blood Cells

I was responsible for the properties for the red blood cells such their instance variables and their behaviors.

Spawning

Spawning is essential in the game play mechanic as it sets the difficulty level for the game. For all game modes, the cell is spawned randomly on the x-axis from points 10 to 860, and point 0 on the y-axis for every 2 seconds.

I designed the spawning mechanics for both game modes, Endless and Timed. The difference is that in Endless the spawning is increases by one for every 30 seconds, while in Timed there are 4-5 cells spawning at once for every 2 seconds.

Stats Generator for Red Blood Cell Object

To identify whether or not the red blood cells are cancerous or not, the instance variables are manipulated upon the object's first spawn.

On created, the red blood cell instance variable MutateRate is randomized from rounded values of 1 to 100. The MutateRate randomized value dictates how the stats (Size, Damaged, and Growth Rate) are randomized. Red blood cells with MutateRate of 25 and below are considered to be cancer cells, while greater than 25 are considered to be a normal cell.

If a red blood cell has a MutateRate of below 25, the instance variable for Size will be randomized from 1 to 25, and 70 to 100 using the formula $\text{random}(1, 25) + (\text{random}(70, 75) * \text{random}(0, 1))$, while Damaged is set to "Damaged" and Growth Rate is randomized from 70 to 100.

If a red blood cell has a MutateRate of above 25, the instance variable for Size will be randomized from 26 to 69, Damage will be set to "Healthy" while Growth Rate value is randomized from (1, 69)

This is to reflect the fact that cancer cells have abnormal sizes compared to regular cells, as they could be significantly smaller or larger than average. A cancer cell tends to not repair themselves, hence they are represented by the stats of "Damaged". The growth rate of cancer cells is also faster than those of regular cells, hence why the growth rate is larger value for cancer cells.

Drag and Drop

The main gameplay of this project is dragging and dropping the cells into the appropriate zones, so this section explains the mechanics of the Drag and Drop behavior. My contribution was to make the experience smooth while dragging the cells, but also to prevent them from exploiting the object's behavior of collision and solid state. For example, making it still possible for players to drag the cells under the effect of freeze and also disabling collision on drop to prevent unnecessary bounce.

Accept and Reject (Scoring)

Accept and reject is the essentially the scoring system for the game; you accept normal cells and reject the cells that has become cancer cells. My responsibility was to ensure scoring system is flawless and contain no errors as a buggy scoring system makes the game unplayable

To check whether or not the cells has been dropped in the correct area or not is judged by the collisions between RedCell sprite and AcceptSprite and RejectSprite. These invisible sprites are positioned in the bottom of the layer as the players are not to see these sprites. The AcceptSprite is positioned to the left side while the RejectSprite is positioned to the right side. Depending on the cell's mutate rate, the collisions will trigger either the scoring or damaging the player's life points.

Power Ups (Slow, Freeze, Cell Wall)

There are three powerups in the game to give players incentive to play the game more frequently and be rewarded with skills that can help aid players to score higher points in the game.

I was responsible for designing and executing three of the power ups available, which is Cell Wall, Freeze and Slow.

Cell wall spawns a wall of cells that reflects oncoming cells for 5 seconds to push cells away from the wrong zones. This is achieved by setting the visibility and state of the cell wall to visible and solid for 5 seconds so that on collision the red cells bounce off the cell wall.

Freeze freezes all the red cells currently on screen for 10 seconds, but they can still be drag and dropped when they are clicked. This is done by disabling the red cell's Bullet behavior for 10 seconds.

Slow reduces the speed of the red cells significantly for 10 seconds by reducing the acceleration and gravity of the red cell object.

Endless and Timed Mode

There are two game modes in the game, Endless and Timed. I was responsible for both game modes while the main difference between Endless and Timed are it's spawning there were other differences as well. I was responsible for the way the timer worked, which dictated how the two game modes are different and also the scoring for timed mode.

