**Project Proposal (Deadline 27 July 2021)**

The proposal should be as detailed as possible. You may include additional items in the proposal and it can be more than one pages long. Any major deviation from the original project idea after confirmation of project title will result in a penalty of marks.

|  |  |
| --- | --- |
| **Project Title:** | **Organism simulations with the aid of procedural map generation** |
| **Domain:** | Nature/Biology |
| **Subject Area:** | Simulation |
| **Description:** | **A javaFX project on visualizing algorithms mimicking organisms that are present in nature in maps that are procedurally generated.**  **Features:**   * **Life forms:**   + **Slime mold**   + **Boids (schools of fish behavior in the sea)**   + **Predator vs Prey (Fox vs Rabbits)**   + **Ants (pheromone trails)** * **Map generation:**   + **Cellular automata**   + **Perlin noise** * **Saving/Loading of maps** * **Movable maps** * **User can create their own maps** |
| **Objective(s):** | **Demonstrate how life forms such as slime mold behave under different conditions such as different maps.** |
| **Target Users:** | **Biology students to observe the life forms, CS students for visualizing the life forms/ make use of the maps generated.** |
| **Project Plan and Timelime** | 1. **Design the basic GUI** 2. **Implement 2 life forms that are simulated on an empty map** 3. **Implement cellular automata map generation** 4. **Improve GUI, quality of life improvements.** 5. **Implement the other 2 life forms** 6. **Implement perlin noise map generation** |
| **Resources and Tools Use** | **IntelliJ, Scenebuilder** |
| **Target Outcome and Benefits** | **Highly interactive application for the user to play around with the settings of the life forms. Useful for people to understand more about how nature behaves.** |
| **GUI Design Layout** |  |
| **References** | [**https://www.redblobgames.com/maps/terrain-from-noise/**](https://www.redblobgames.com/maps/terrain-from-noise/)  [**https://www.youtube.com/channel/UCmtyQOKKmrMVaKuRXz02jbQ**](https://www.youtube.com/channel/UCmtyQOKKmrMVaKuRXz02jbQ)  [**https://gamedevelopment.tutsplus.com/tutorials/generate-random-cave-levels-using-cellular-automata--gamedev-9664**](https://gamedevelopment.tutsplus.com/tutorials/generate-random-cave-levels-using-cellular-automata--gamedev-9664)  [**https://www.youtube.com/watch?v=xFimP0gFyIc**](https://www.youtube.com/watch?v=xFimP0gFyIc) |