CS6.301: Design and Analysis of Software Systems Spring 2023

Assignment-3

Released: March 28th Deadline: April 8th

Instructions

- Submit all your code files and a README.md as a zip file, named as <rollnumber>.zip.
- The readme should describe your extensions.
- The deadline is April 8th, 23:59. This is a hard deadline and no submissions will be accepted after this.
- TAs to contact : Abhijeeth, Mugundan, Karmanjyot, Harshita.
- Plagiarism detectors will be run on all submissions, so please do not copy. If found, you would be given a straight zero for the assignment.

Introduction

For this assignment, you need to extend the provided codebase. The objective of this assignment is to test extensibility. This assignment should only take you a couple hours to do, given that mode is modular.

Codebase can be found here.

Game Additions (30):

- **Stealth Archers (10):**
  - Each Stealth Archer gains the trait of **invisibility for 10 seconds** from the moment it was spawned. Stealth Archers cannot be targeted by any buildings while invisible.
  - After 10 seconds are over from the time the Stealth Archers were spawned, they will behave like normal Archers (can be attacked by buildings)
- **Healer (20)**
  - Healer, unlike other troops, doesn't target buildings. It instead follows and targets friendly troops. Instead of attacking, healers heal troops in a certain AoE (area of effect) around its target location.
  - Attributes:
    - Health = 250
    - Heal Strength = 20
    - Heal Radius = 1
      - I.e. if the healer is targeting the position (x,y), all troops in a 1 tile radius of (x,y) will receive healing.
    - Range = 7 tiles

Bonus (15):

- **Building Levels (15):**
  - Each building should have a **level** (between 1 and 5, both inclusive).
  - The level of a building will control its health, damage, and other attributes.
  - For Cannon and Wizard Tower:
    - Attack = 4 + level
    - Attack Range = 5 + (level//2)

- - - Max Health = 60 + 30*level
  - ○ For Wall:
    - ■ Max Health = 100 + 40*level
    - ■ Walls with level >= 3 will explode upon being destroyed.
      - ● Explosion damage: 200
      - ● Explosion radius: 2 tiles
        - ○ I.e. damages any grounded troop with x between [wall.x-2, wall.x+2] and y between [wall.y-2, wall.y+2]. All conditions must be satisfied to deal damage to a troop.

VIVA (20)

There'll will be a viva on your basic understanding of OOPS concepts (abstraction, encapsulation, inheritance and polymorphism)

Library Usage

- ● Your game must mandatorily be coded in Python3.
- ● No curses libraries (like pygame) are allowed. Only libraries allowed are colorama and numpy. In case of any doubts about whether a particular library is allowed, please post it on the Moodle thread and get it clarified from one of the TAs.

Deliverable

File Structure:

- ● <Roll Number>
  - ○ README.md
  - ○ game.py: the main game file which will be run to play the game
  - ○ src: folder containing any other code files
  - ○ replays : folder storing the necessary files for the replay
  - ○ replay.py : python file needed for rendering a replay

A zip file, <rollnumber>.zip containing the code files and README. For instance, 2020101006.zip when extracted must generate a folder with the name 2020101006. Inside that folder, all code files must be present. Ensure your code is modular with multiple python files. Please ensure to follow the submission format and submit ONLY .zip files.

Plagiarism is a strict NO, and Karman is running moss 😈 So please do not copy from anyone. We'd be forced to give you a zero for the assignment.

Happy coding 😇