24-783: Advance Engineering Computation Project

“Bubble Bobble” Component Design

Group: HaveAGoodDay

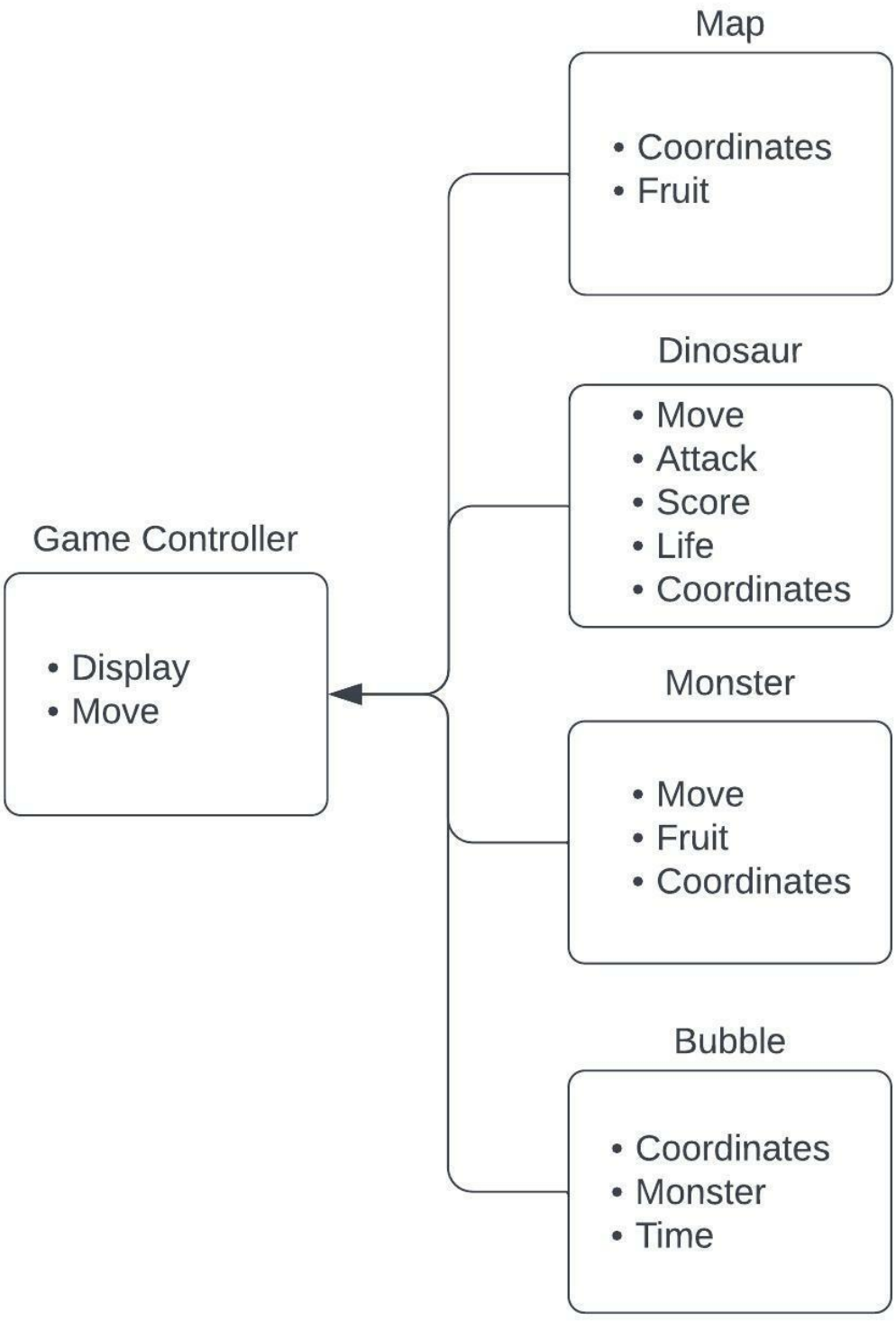
- project
    - bubble_bobble
    - main.cpp
        - class ApplicationMain
            - array bubbles
            - array enemies
            - array fruits
            - show(), show_menu(), show_l1(), show_l2(), show_l3()
            - add_bubble(), delete_bubble(), update_bubble()
            - update_enemy()
            - update_score()
            - update_user_location()
            - usr_action()
            - run_step()
        - main()
        - CMakeLists.txt
    - png
    - menu
    - maps
    - player
    - fruit
    - enemy
    - simplebitmap
    - CMakeLists.txt

Description of the components:

- Game Controller
    - vector<Monster>
        - list of monsters
    - gameState
        - the frame of the current game state, used for rendering
    - execute()
        - main logic executed at each step
    - vector<bubbles>
        - list of bubbles
    - Map
        - 2D grid of cells

- Dinosaur
    - coordinate: (int x, int y)
    - move()
        - Receive keyboard signal, move left, right or jump.
        - Update coordinates x and y
    - attack()
        - Emit bubbles
    - score()
        - Eat fruits to add scores, automatically eat when the dinosaur reaches the fruits
    - life
        - indicate how many lives users has
        - game starts with 3 lives
        - game ends when 0 live left
- Monster
    - coordinate: (int x, int y)
    - move()
        - moveLeft() and moveRight()
        - only move on the rock in a certain range, will not drop from the rock
    - fruit()
        - Become fruits when the dinosaur reaches the bubbled monster and adds scores.
- Bubble
    - coordinate: (int x, int y)
    - monsters()
        - indicate if monster is trapped inside this bubble
    - time
        - indicate when the bubble should explode
        - when it's time to explode, if no monster was trapped, then bubble disappear
        - when it's time to explode, if a monster was trapped, then monster come back to game
- Map
    - int[][] 1 represents rocks, 2 represents fruits

Diagram


Map
• Coordinates
• Fruit
Dinosaur
• Move
• Attack
• Score
• Life
• Coordinates
Game Controller
• Display
• Move
Monster
• Move
• Fruit
• Coordinates
Bubble
• Coordinates
• Monster
• Time

Who is in charge (tentative)

- display: Chenlyu, xwu4, zhanfany
- mechanism: yingluo, yuyinga

Display part:

- Find available maps and figures resources.
- Use appropriate data structures to store the edges information of the map.
- Display maps, the dinosaur, monsters, bubbles, and fruit in the user interface.
- Animations of bubbles disappear, bubble monsters, scoring and life update.
- User menu.

Mechanism part:

- Game controller mechanism
- Class for dinosaur, monsters, bubbles, and fruit
- Scoring system
- Bubble bouncing mechanism
- Dinosaur movement and bubble monster

Unit Test

- Timer test
    - test if master can escape from the bubble after a certain amount of time
    - test if bubbles can explode then disappear after a certain amount of time
- Control mechanism test
    - test if little dinosaur can only jump once a time, and only can stand on rocks
    - test if little dinosaur can move freely in the map
    - test if the little dinosaur can emit bubbles and receive scores
- Counter test
    - test if score increment correctly when user earn points by eating fruits and killing monsters
    - Initialize the position of the dinosaur and the fruit which is exactly right of the dinosaur. Make the dinosaur keep moving right to reach the fruit.