

CS 246 Design Document

Assignment 5(cc3k)

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Introduction

This document outlines the design of the CC3K game by Xiangyu Wang(x589wang) and Jianwei Liang(j59liang) for the group assignment 5 of CS246. Generally we used decorator pattern, MVC pattern, factory pattern and inheritance to make the game.

Assignment specification approach

1. Floor setup
 - a. We decide to use MVC pattern for the game. When the game starts, main will construct a controller class and call play method in controller. The method play is the transfer station of the game, which is responsible to get command and call methods. At the beginning of the game, play will call setmap in game which will read in q5map.txt (an empty map in here) and assign the display board. On the other hand, the display board consist of many Cell ** class. Each Cell contains the position of the cell and pointers of enemy, potion, gold and game. (ene,gold,pot,game) For instance, if the cell is a Halfling (an enemy), the enemy in cell will be created but gold and potion will be NULL.
 - b. We will get an empty map after setmap. Then we need to figure out whether user want to include a file or stdin. For stdin case, play will call startgame in game or startbyfile otherwise. We decide to use factory design pattern to produce enemies.
 - i. Startgame
 1. Set player
 - a. Create player
 - b. Assign position and change the board
 - i. Stair and player are setting at the same time to avoid they assign in the same room
 2. Set potion/gold/enemy
 - a. Create a Set potion/gold/enemy
 - b. Assign a random room then position, and then change the board
 - c. Set the cell(if it is an enemy cell, call setenemy which will let the ene point to the enemy which has been created.pot and gold will still be NULL)
 3. Dragon will only come up when dragon hoard is created. It will place nearby the hoard in random direction.
 - ii. Startbyfile
 1. Read in symbols(0-9,@,\ and enemies)

2. Setgold when reading in 6-9
 3. Setenemy when reading in letters
 4. Set player when reading in @
 5. Setpotion when reading in 0-5
 6. Similar to startgame.
 7. When we detect a 'D' or '9', it find a unsigned '9' or 'D' nearby to make sure the dragon is well assigned in correct Dragon hoard.
2. Move
 - a. Player move
 - i. Read in direction and change the position of the player. If it is an invalid move, then nothing happens and print an error message.
 - ii. If the player move on a gold, we will check if it is a dragonhoard. If it is not, the player will get a gold. If it is a dragonhoard and the hp of the dragon of it is not dead, the player can't get the gold.
 - iii. When the player on a stair, we will new a player and just change the hp and start a new game.
 - iv. Check if there are potions near player and print message.
 - v. Check if player is near dragon hoard, dragon will guard his treasure!!
 - b. Enemy move
 - i. Enemies will first check is there any player nearby. If yes, combat. If no, move. The Dragon never move.
3. Combat
 - a. We use visitor pattern to solve combat. So each player have 7 attacks and 7 beattack methods for each enemies which is really helpful.
 - i. Player
 1. When user type in "a" and a direction. He will attack the enemy if the command is valid.
 2. When user attack merchant, merchant will become hostile. Merchant will attack player until the end of the game or restart. A bool hostile in player will become true.
 3. Enemy has combat and bcombat. When player attack, the enemy bcombat will be called. The bcombat will call attack method in player class.
 - ii. Enemy
 1. Enemies will check if player is near them. If it is, enemies will attack the player before moving.
 2. Enemies will use combat in enemy class which calls method bcombat in player class.
4. Use potion
 - a. User type in "u" and a direction to use potion. At beginning, the name of the potion is unknown. Once the potion has been used, the name of the

potion will be the true name of the potion. There will be an array of integers in game, if the potion has been used, the cell of the array will change underlying by the potion that the player used.

- b. Potions will change the stat of the player. However if the player enter into next floor, the stat will be changed except hp and gold.
5. Others
- a. Every enemies and players all have their special case. So every enemies and players will have its special attack and beattack functions.
 - b. When user enters 'r', game will restart. The floor will be cleaned and the map will become an empty board and the game will start again.
 - c. We use decorator pattern to print messages. The message will update if the events happen.

Conclusion

Overall we all feel the project assignment is a really unforgettable experience. It is the first game we have ever made. We used many design patterns. This assignment helps us understanding the content which has been discussed during the class. It is also a good experience to work a game project with a partner. We will keep working hard for the final exam.