

CS-224 Object Oriented Programming and Design Methodologies

Fall 2021

Homework 1

1 Submission Policy

You need to submit this homework on **17th September at 8pm**, on LMS. Late submissions are allowed until **19th September 11:59pm**, which will be penalized by 20%. Your work will not be accepted once the submission is closed on LMS.

2 Guidelines

Some important guidelines about the homework are as following:

- You need to do this homework alone
- You need to follow the best programming practices as given in the accompanying document and it is also present on LMS. Failure in doing so will have your marks deducted.
- Submit assignment on time; late submissions will not be accepted.
- Some assignments will require you to submit multiple files. Always Zip and send them.
- It is better to submit incomplete assignment than none at all.
- It is better to submit the work that you have done yourself than what you have plagiarized.
- It is strongly advised that you start working on the assignment the day you get it. Assignments WILL take time.

- Every assignment you submit should be a single zipped file containing all the other files. Suppose your name is John Doe and your id is 0022 so the name of the submitted file should be JohnDoe0022.zip
- DO NOT send your assignment to your instructor, if you do I will just mark your assignment as ZERO for not following clear instructions.
- You can be called in for Viva for any assignment that you submit

3 Legend of SeePlusia

Prince Lazy has been captured by an evil wizard. You are Zeldana, a female warrior who takes it upon yourself to rescue the prince and return him to his family. You go off on a quest through the dangerous world of SeePlusia to search for the four mythical crystals of Objectos. Together the crystals will give you the power to defeat the wizard and rescue Prince Lazy. The world of SeePlusia is shown in Fig. 1. It shows the different locations in the world. The direction of travel between locations is given by an arrow and the number of apples required to travel from one location to other are also shown.

The rules of the game of Legend of SeePlusia are as follows.

- You begin at Enchanted Forest on the first day with 30 apples.
- You have to save Prince Lazy who is held captive at Wizard's Castle.
- At each location you can only go in one of four directions: north, south, east, west.
- If a direction is not shown on the map, it's an invalid move, e.g. north from Marsh of the Undead. An invalid move uses up the move and consumes one apple.
- A valid move consumes the number of apples as drawn on the arrow, e.g. to travel from Enchanted Forest to Wampire Cove, three apples are consumed.
- Before rescuing the prince, you have to collect all four Objectos crystals from the indicated locations.
- An Objectos crystal is automatically retrieved when you arrive at its location.
- Once you retrieve a crystal, it is no longer present at that location.
- If you arrive at Sands of Quick, you slowly sink into quicksand and die and the game is Lost.
- You cannot move past Bridge of Death to Wizard's Castle unless you have all four crystals.
- You cannot move past Eisten Tunnel unless you have at least three crystals. You need 10 apples to reach Wizard's Castle from Eisten Tunnel. *Call moveNorth twice to make a longer jump.*

- Once you reach Wizard's Castle, the Prince is rescued and the game is Won.
- You can add 6 apples to your life by visiting Apples Orchard.
- If you run out of food before rescuing the prince, you die of starvation and the game is Lost.

4 Your Task

A bare-bone implementation is given in Seeplusia folder. You can move the warrior by arrow keys, and it does some arbitrary operations to demonstrate how to use the available functions. You have to provide the implementation of `seeplusia.cpp` \Rightarrow `makeMove (string direction)` function in accordance with the game rules given above. This function is called every time you press an arrow-key with appropriate direction provided as argument. To modularize the program, you should add other functions as well in the same file, that you call in `makeMove`.

Note: If any rule is not clearly mentioned in the above game rules, you can implement it at your own discretion. You can make this game more fun by adding any other feature on top of the rules explained above.

5 Game Status

The bottom part of screen displays the game status that shows:

- **Apples:** Initially it shows all the 20 apples available, as you travel the number of apples are reduced.
- **Crystals:** Initially there are no crystals, but as you find one, you will increment the `nCrystalsFound`, and they will be shown next to apples.
- **Game State:** It displays Running, Lost or Won as per game rules.

6 Available Functions/Parameters

- `moveEast()` : moves the warrior to East.
- `moveWest()` : moves the warrior to West.
- `moveSouth()` : moves the warrior to South.

- `moveNorth()` : moves the warrior to North.
- `applesLeft` : set it to the number of apples left.
- `nCrystalsFound` : set it to the number of crystals found so far.
- `gameState` : set it to `Running`, `Won` or `Lost`.

7 Rubric

Warnings/Errors	The code had no warnings/errors	1
Comments	The code was properly commented	1
Coding	The code followed best practices guideline	4
Game Logic	Game logic is fully implemented	4
Total		10

Table 1: Grading Rubric

8 Acknowledgement

This assignment is adapted from the work of Naveed Ejaz.

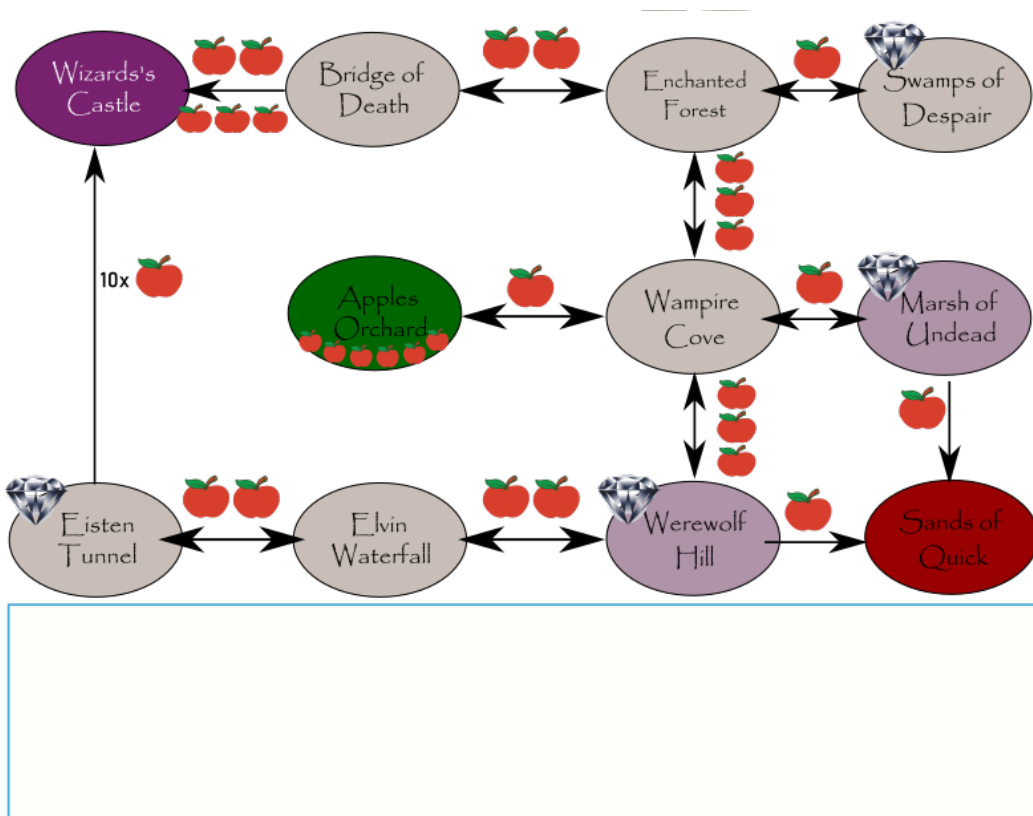


Figure 1: World of Seeplusia