CSE 102 Spring 2024 – Computer Programming Assignment 9

Due on May 8, 2024 at 23:59

In this homework, you are going to implement a game. Suppose that a botanist looking for a quite rare flower by walking randomly in a forest. He/she is sure that the rare flower exist in that forest. The Botanist aims to collect all rare flowers in his/her bottles.

The program should end when the botanist finds all rare flowers or when the user chooses to exit the program. You should store the collected flowers by the botanist in an array. Choose the type of array that you prefer for this process.

A forest contains the followings:

1. Map [Integer][Integer]: This is a 2D array.
2. Width [Integer]: This stores number of rows (size of dimension X) the map.
3. Height [Integer]: This stores number of columns (size of dimension Y) of the map.
4. Flower_X [Integer]: This is the X coordinate of the rare flower.
5. Flower_Y [Integer]: This is the Y coordinate of the rare flower.

The botanist has the following properties:

1. Coord_X [Integer]: The X coordinate of the botanist.
2. Coord_Y [Integer]: The Y coordinate of the botanist.
3. int Number_of_Bottle: This is the number of bottles the Botanist has.

Function: void init_game(Forest forest, Botanist botanist)

This function reads a file called init.txt and creates both the forest and the botanist. The first line contains height and width of the forest separated by ",". The second line contains coordinates of Botanist and his/her number of bottles. Starting from the second line, map is defined. Trees, the botanist and the rare flower is illustrated as T, B and X.

Sample init.txt
10,10
1,0,100
T,T,T,T,T,T,T,T,T,T
B, , , ,T,T, , , ,T
T, ,T, , , , ,T, ,T
T, ,T,T,T,T, ,T, ,T
T, ,T, , , , ,T,T,T
T, ,T, ,T, , , , ,T
T, ,T, ,T,T,T,T,T,T
T, ,T, , , , , , ,T
T, ,T,T,T,T, ,T, ,T
T, , ,T, ,T,X,T,T,T

Function: void search(...)

This is a recursive function that walks (up, down, left and right) on the forest to find the rare flower. Botanist can move only in whitespaces. Botanist says "I've found it!" whenever he/she finds it.

Function: display_forest(…)

This function shows the collected flower number and not used bottle number and also gives us the Botanist coordinates. Update the botanist's view as you move through the forest. If the Botanist finds a Flower replace it with the whitespace.

Notes:

- You should use "init.txt" when reading file.
- You have to write recursively the functions that we want to be written recursively. Otherwise, you cannot get points from these parts.
- Use structure when holding forest and botanist information.
- Take direction information from the user in the form of r(right),l(left),u(up),d(down).
- You can move in only whitespaces. If the user wants to go on trees, return a warning.
- Save the last view of the forest and information in another .txt file before leaving the program.
- Do not forget that the size of the forest and the number of flowers are changeble. Do a test according to this.

IMPORTANT NOTES:

- Submit your homework as a zip file named as your student id (StudentID.zip) and this file should include:
  - YourStudentID.c file
  - init.txt file
  - last.txt
  - your_school_id_report.pdf file
- Compile your work with given command "gcc --ansi your_program.c -o your_program".
- If you want to write your code in an IDE, there's a risk you chose. Your code may not compile and run on our computer. If there are any problems with this, it will be a concern for you. Please be careful about this.
- Please be careful when uploading your assignment. Incorrectly uploaded assignments will not be accepted.
- Your work will be evaluated using gcc version 11.4.0.
- For any questions and problems, you can always contact me **via email** (nbengisucolak@gtu.edu.tr), (n.colak2023@gtu.edu.tr), or you can find me in Room 122 during scheduled office hours on Aprilt 25- May 8, 2024, between 10:30 and 12:30.