CSci 1113: Introduction to C/C++ Programming for Scientists and Engineers Homework 7 Spring 2018

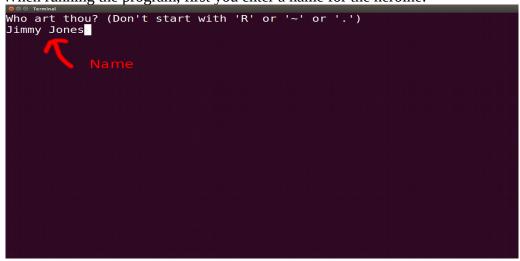
Due Date: Thursday, April 5, 2018 before 11:55pm.

Instructions: This is an individual homework assignment. There are two problems worth 20 points each. Solve the problem below by yourself (unlike the labs, where you work collaboratively), and submit the solution as a C++ source code file. Here are a few more important details:

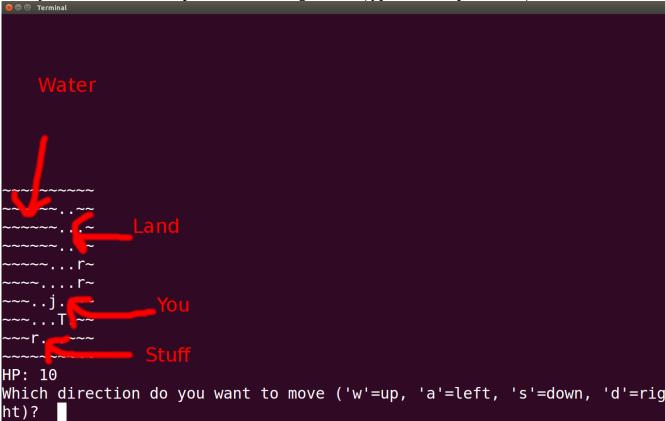
- 1. Unlike the computer lab exercises, this is not a collaborative assignment.
- 2. Because all homework assignments are submitted and tested electronically, the following are important:
 - You follow any naming conventions mentioned in the homework instructions.
 - You submit the correct file(s) through Moodle by the due deadline.
 - You follow the example input and output formats exactly given in each problem description.
 - Regardless of how or where you develop your solutions, your programs compile and execute on cselabs computers running the Linux operating system.
- 3. You should test your program on other test cases (that you make up) as well. Making up good test cases is a valuable programming skill, and is part of ensuring your code solution is correct.

All of these problems relate to "HeroineQuestV2.cpp". This is a rather large piece of code, so you should try to familiarize yourself with it before attempting to solve the problems. You do not need to understand every part of the code to solve the problems, just the general structure of the code. (Note: the left-hand side of geany (under "Symbols") lists the functions (and variables), which can allow you to jump around to them in the code quickly.)

When running the program, first you enter a name for the heroine:



Then you are shown to a map. You move using "wasd" (type one then press enter).



Problem A: Randomization (20 points)

Currently both the Heroine and "monsters" do fixed damage during battle. Modify the code so that a random number is generated between the current damage to twice the current damage (inclusive). For example, the Heroine currently does 1 damage. After this modification, the heroine should do randomly between 1 to 2 damage.

Every integer should be possible and each value should have equal probability (i.e. a uniform distribution). So if the Heroine's damage was originally 2, you should under this modification be able to do 2, 3 or 4 points of damage, each with probability 1/3.

Example 1:

When you are done, name the source code file <username>_7A.cpp. Here you replace <username> with your U of M email address; for example, if your email address is smithx1234@umn.edu, your file should be named smithx1234_7A.cpp. Then submit your program using the HW 7 Problem A submission link in Moodle.

Problem B: Bunny hop (20 points)

Modify the program so that the rabbits move around the board. Each rabbit should individually randomly decide to me up, down, left or right on the board. However, if the rabbit decides to move into a spot that is water (the $^{\prime}\sim^{\prime}$), it will instead just not move at all.

Since the heroine moves needs to move as well, this should be done as:

First, the heroine moves.

Second, check to see if the heroine is on any rabbits.

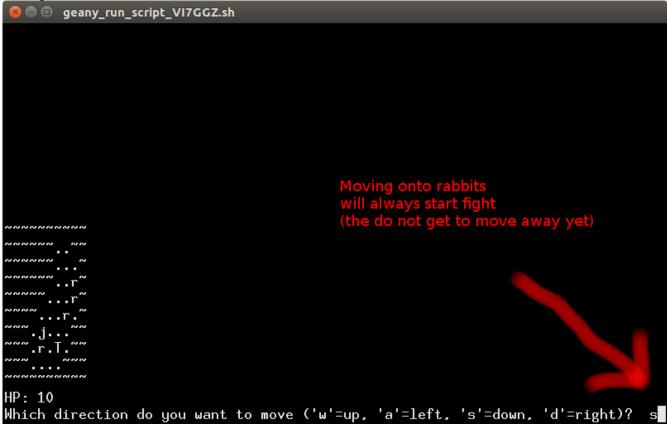
Third, move all the rabbits.

Fourth, check to see if any rabbits moved onto the heroine.

This means it is possible to have two "battles" in a row if (1) the heroine moves onto a rabbit then (2) a rabbit moves onto the heroine (where the old rabbit was).

Note: it is okay if rabbits can move on top of the "town".

Example 1:



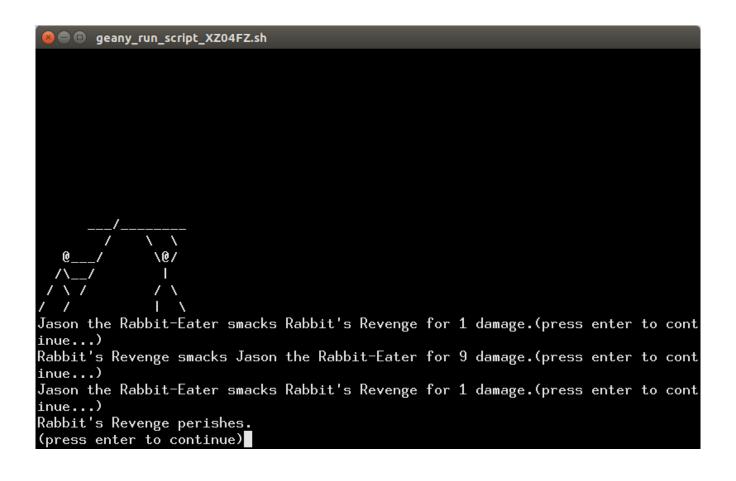
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geany_run_script_VI7GGZ.sh

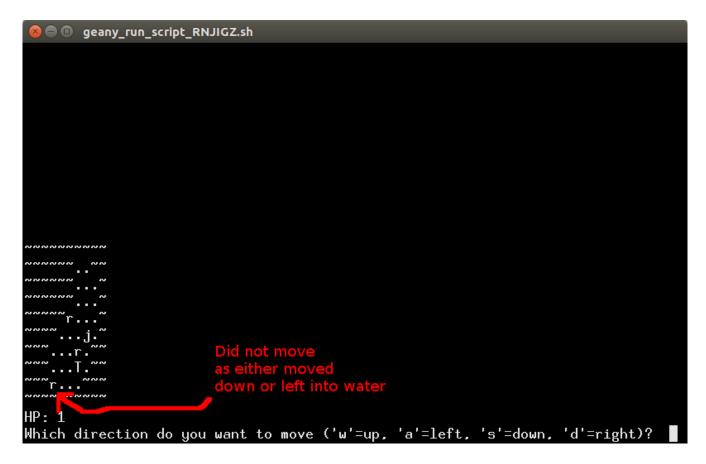
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Jasper Spookey smacks Rabbit for 1 damage.(press enter to continue...)
Rabbit smacks Jasper Spookey for 1 damage.(press enter to continue...)
Jasper Spookey smacks Rabbit for 1 damage.(press enter to continue...)
Rabbit perishes.
(press enter to continue)
```



Example 2:

```
| I move down and the rabbit to the down-right moved left, so we ended up on same spot
```





When you are done, name the source code file <username>_7B.cpp. Here you replace <username> with your U of M email address; for example, if your email address is smithx1234@umn.edu, your file should be named smithx1234_7B.cpp. Then submit your program using the HW 7 Problem B submission link in Moodle.