

CS 135 - Assignment 3

Minecraft Steve needs your help!

Purpose:

The purpose of this assignment is to become comfortable integrating conditional statements and decision making into C++ programs. This allows programmers to add depth and choice depending on conditions that are satisfied.

In this assignment, students will be able to implement C++ code that implements the following

- Interactive user input
- Input error checking
- Use of conditional statements to execute decision making
- Use of switch statements to handle multiple cases

Premise:

Minecraft Steve needs your help! Steve is trying to program a device that can tell whether or not a crop can be found given a biome location on a particular month, and display the rate of the crop spawn. As someone playing on his server, he has asked you to help design a prototype with the following conditions:

Input Handling:

The prototype will need to prompt the user for a valid biome and output an error message if a valid biome is not provided.

The valid biomes include: Grasslands, Tundra, and Forest.

The user will enter **G**, **T**, or **F** respectively. The program IS NOT case sensitive, meaning you will need to handle lowercase letter inputs: **g**, **t**, or **f**.

Hint: We can either make our conditional statements to include 6 cases, or we can take advantage of the **tolower()** or **toupper()** functions to change an uppercase letter to a lowercase letter or vice versa.

`tolower(char)` - returns the lowercase character

<https://cplusplus.com/reference/cctype/tolower/>

`toupper(char)` - returns the uppercase character

<https://cplusplus.com/reference/cctype/toupper/>

Afterwards, the user should be prompted to input the crop they are interested in. Acceptable inputs would be (**C/c**) and (**P/p**), for carrots and pumpkins.



Finally the user should be prompted to what the current minecraft day is. Remember, days cannot be negative!

The program should be able to catch bad inputs and display an appropriate error message and close the program.

Determining the month:

The location and month affects the spawn rate of each crop separately. Because the program only prompts the user for the total in-game days, we will need to calculate which month we are currently on.

Here are some assumptions we can make:

- A minecraft year follows the traditional 12-month cycle
- A minecraft year contains only 360 days making each month exactly 30 days.

Hint: With these assumptions, we can simply calculate the current month by taking the modulus of the days with the number of days in a year. This will give us the leftover days in the current year. **Be careful** as we have an extra case to consider as the last day of the year will be treated as day 0. We can create a special case to accommodate this.

Example formula:

$$\begin{aligned}\text{Day} &= (\text{Number_of_days} \% \text{days_in_a_year}) \\ \text{Month} &= \text{round}(\text{Day} / \text{Days_in_a_month})\end{aligned}$$

From there, we can determine our current month by dividing the remaining days with the days in a month and rounding up.

Determining the rate:

Below is a table of the rates of both carrots and pumpkins.

Month	Carrot Rate	Pumpkin Rate
January - 01	2.0	0.0
February - 02	1.5	0.0
March - 03	1.5	0.0
April - 04	1.5	0.0

May - 05	0.8	0.0
June - 06	0.8	0.0
July - 07	0.8*	0.0
August - 08	0.8*	0.6
September - 09	0.8*	0.6
October - 10	2.0	2.0
November - 11	2.0	1.5
December - 12	2.0	0.9

Note: * Carrots can only be found in the tundra biome from the months July - September.

Output:

Finally the program will need to output and let the user know whether or not the crop can be found in its current biome at the current month, and at what rate we expect to see it.

Debugging and Testing:

It is recommended to test and debug after a few cases and logical steps to ensure your code is working properly at every stage. Please compile your main.cpp file using g++ on a local session before submitting it on CodeGrade.

Submission

Make sure to include this header portion at the top of your code. Replace the necessary information with your information as needed.

Remember to name your file as **main.cpp**

```
/*
Name: YOUR_NAME, NSHE_ID_#, COURSE_SECTION, ASSIGNMENT_#
Description: DESCRIPTION_OF_PROGRAM.
Input: EXPECTED_PROGRAM_INPUT.
Output: EXPECTED_PROGRAM_OUTPUT.
*/
```

Example Output:**Good Input:**

\$./a.out

Please enter the current biome

t

Please enter the crop you wish to find

c

Please enter the current day in game

589

Carrots can currently be found at 0.8x rate.

\$./a.out

Please enter the current biome

g

Please enter the crop you wish to find

p

Please enter the current day in game

782

Pumpkins currently cannot be found.

Bad Input:

\$./a.out

Please enter the current biome

p

Error: Biome cannot be found

\$./a.out

Please enter the current biome

t

Please enter the crop you wish to find

83

Error: Crop does not exist

\$./a.out

Please enter the current biome

g

Please enter the crop you wish to find

p

Please enter the current day in game

-10

Error: Day cannot be negative