

CS 3005: Programming in C++

Difference

Introduction

The subtraction operation is also known as the difference between two numbers. When subtracting two numbers there are specific names for each of the numbers. For example, in this expression,

```
c = a - b
```

`a` is the Minuend, `b` is the SubMinuend, and `c` is the difference.

Task

In this task, you will make a program that allows the user to input two `double` numbers and display the difference of the two numbers. The program's exit code will be 2 if the difference is positive, 1 if the difference is negative, and 0 if the difference is zero.

An few interactions with the program may look like this:

```
$ ./program-difference/difference
Minuend? 3.4
Subtrahend? 1.9
Difference 1.5
$ echo $?
2

$ ./program-difference/difference
Minuend? 73.2
Subtrahend? 100
Difference -26.8
$ echo $?
1

$ ./program-difference/difference
Minuend? 46.7
Subtrahend? 46.7
Difference 0
$ echo $?
0
```

Programming Requirements

Create `library-commands/difference_aux.{h,cpp}`

Functions:

- `int difference(ApplicationData& app_data);` Asks the user for the "Minuend?" and "Subtrahend?". Calculates the difference and displays it, as shown in the examples above. The return value from this function is 0 if the difference is zero, 1 if the difference is negative, and 2 if the difference is positive.

Update `library-commands/Makefile`

Add `difference_aux.{h,cpp}` in the appropriate places to add them to the library and install the header file.

Create `program-difference/difference.cpp`

Functions:

- `int main();` Entry point to the difference program. Should create an `ApplicationData` and pass it to the `difference` function found in `difference_aux` and return the result of that function call.

Create `program-difference/Makefile`

This file must contain rules such that any of the following commands will build the `difference` program:

- `make`
- `make all`
- `make difference`

Create `program-difference/.gitignore`

The file `program-difference/.gitignore` needs to store one line of text:

```
difference
```

This will prevent the executable program from being committed to the repository. It is a *derived file*.

Update `Makefile`

- Update the project-level Makefile so that `make` and `make all` in the project directory will call `make` in the `program-difference` directory.
- If necessary, make sure the order of make commands is correct to build prerequisite libraries in the correct order.

Additional Documentation

- None

Grading Instructions

To receive credit for this assignment:

- your code must be pushed to your repository for this class on GitHub
- all unit tests must pass
- all acceptance tests must pass
- all programs must build, run, and execute as described in the assignment descriptions.