

CSci 1113: Introduction to C/C++  
Programming for Scientists and Engineers  
Homework 1  
Spring 2018

**Due Date: Thursday, Feb. 8, 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.

**Problem A: Clocks forward** (20 points)

Ask the user to enter three inputs: the time in hours, the time in minutes and whether it is AM or PM. Then ask the user for a second number and move the clock a certain amount of minutes forwards. After this, print out the new time (in AM/PM format).

You can assume that the initial time is well formatted. in other words the hours will be between 1 and 12, and the minutes will be between 0 to 59. The last will always be either 'A' or 'P' (in upper case). However, when choosing how many minutes to move the clock forward, it can be any (positive) whole number.

Note: Noon is more commonly considered 12:00pm and midnight is 12:00am. Since it is a hassle to get well formatted numbers, you do not need to make the minutes time always be two digits. So in the example shown, please have it say 12:2 instead of 12:02. (This is to make your lives easier.)

Example 1 (user input is underlined):

Enter the current time:

11 23 A

How many minutes forward do you want to move the clock?

39

New time: 12:2 PM

Example 2 (user input is underlined):

Enter the current time:

12 34 A

How many minutes forward do you want to move the clock?

9999

New time: 11:13 PM

When you are done, name the source code file <username>\_1A.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\_1A.cpp. Then submit your program using the HW 1 Problem A submission link in Moodle.

**Problem B: Clocks forwards and backwards (20 points)**

Ask the user (again) for three inputs: hours, minutes and AM/PM, where again these inputs will be well formatted. Then ask the user for both a number and whether this is moving the clock forwards or backwards (either “B” or “F”). Then display the new time.

Note: If you wrote good code for part A, it would be good to build off of this.

Example 1 (user input is underlined):

Enter the current time:

12 34 A

How many minutes to change?

1234 B

New time: 4:0 AM

When you are done, name the source code file <username>\_1B.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\_1B.cpp. Then submit your program using the HW 1 Problem B submission link in Moodle.