For programming assignment 1, you should write a Python program that will find the difference between two times. Each of the times will be given in hours and minutes using a 24 hour clock, and your program should find the difference between the two times in hours and minutes. So the input to program 1 will be (in order), the hours of the first time, the minutes of the first time, the hours of the second time, and the minutes of the second time. Your program should prompt for the first time, then prompt for the second time, and then compute and print the difference in hours and minutes.

So a correct program might run as follows.

Greetings! This program will find the difference in hours and minutes between two times (in the same day).

Please enter the hours of the first time (24 hour clock)
10
Please enter the minutes of the first time
15
Please enter the hours of the second time.
14
Please enter the minutes of the second time.
05

The difference between the two times is
3 hours and 50 minutes
Bye!

The user input consists of the 10, the 15, the 14, and the 05. The rest of the text is printed by the program. It’s not necessary that your program print exactly the same messages. However it must read in two times in the format specified and print the correct difference between the two times.

Each time will be entered as two ints on separate lines. Both times will lie in the same 24 day, and the second time will be later than the first.

**Functions.** In order to receive full credit, you must use two functions in this program. The first function should convert a time in hours and minutes to a time in minutes. For example, given 3 hours and 15 minutes, the first function should compute

\[ 3 \times 60 + 15 = 195. \]

The second function should take a time in minutes and print out the equivalent number of hours and minutes. For example, given 275 minutes, you can use integer arithmetic to find the equivalent number of hours and minutes:

\[ 275/60 = 4 \text{ hours}, \]
\[ 275 \% 60 = 35 \text{ minutes}. \]
Thus, if the function is given 275 minutes, it should print out something like

4 hours and 35 minutes

Your program should use the first function to convert both input times into times in minutes since midnight. For example, 10 hours 30 minutes is 630 minutes since midnight, because

\[10 \times 60 + 30 = 630,\]

and 13 hours 10 minutes is 790 minutes since midnight, because

\[13 \times 60 + 10 = 790.\]

Your program should then compute the difference in minutes between the two times in minutes. In our example,

\[790 - 630 = 160 \text{ minutes}.

Finally, your program should use the second function to print the number of hours and minutes corresponding to 160 minutes:

\[130/60 = 2 \text{ hours},\]
\[130 \% 60 = 40 \text{ minutes}.

Due Date. In order to receive full credit, your program must be in the p1 subdirectory of your Subversion repository by 2:00 pm on Friday, September 16, and you must turn in a print out of your program by 5 pm on the 16th. So don’t forget to get a print out of your program!

Grading. Your program will be graded on the basis of its correctness and its “static features.”

1. Correctness will be 30% of your grade. Does your program compute the correct difference in hours and minutes for each set of test input?

2. The following static features will be graded.

   (a) Function use will be 30% of your grade. Did you correctly write and use the two required functions?

   (b) Documentation will be 20% of your grade. Does your header documentation include the author’s name, the purpose of the program, and a description of how to use the program? Are the identifiers meaningful? Are any obscure constructs clearly explained? Is each function properly documented with an explanation of its purpose, its arguments, and its return value.

   (c) Source format will be 10% of your grade. Have blank lines and white space been used so that the program is easy to read?

   (d) Quality of solution will be 10% of your grade. Does your solution contain unnecessary calculations? Is your solution too clever — i.e., has the solution been condensed to the point where it’s incomprehensible?

Collaboration. It is OK for you to discuss solutions to this program with your classmates. However, no collaboration should ever involve looking at one of your classmate’s source programs! It is usually extremely easy to determine that someone has copied a program, even when the individual doing the copying has changed identifiers and comments. If we discover that someone has copied a program, the authors of both programs will receive an F in the course.