CS 192/ CMPE 191
Assignment 1

Due Date: Wednesday, December 27, 2006 @ 5:00 PM

This assignment is to be done individually. Here are some rules regarding the assignments in this course:

- You may consult with other students for:
  - General help in using computers.
  - USE of compiler and debugger.
- You cannot get help from others for fixing errors in your code or for solving the assignment.
- For any questions about the assignment consult the Instructor or TAs during their office hours.
- Rules regarding plagiarism are in the Student Handbook

Total Marks: 90

Part I Marks: 50

Write a program that computes the cost of a long distance call. The following rate schedule is used for calculating the cost of a call.

- Any call started between 8:00AM and 6:00PM, Monday through Friday, is billed at the rate of Rs. 24/- per minute.
- Any call starting before 8:00AM or after 6:00PM, Monday through Friday, is charged at the rate of Rs. 15/- per minute.
- Any call started on a Saturday or Sunday is charged at the rate of Rs. 9/- per minute.

In your program, you will ask the user to provide input for three things: (1) The day of week, (2) The time the call started and (3) The length of the call in minutes.

- The day of week will be read as a pair of character values, which are stored in two variables of type char.
  Mo Tu We Th Fr Sa Su
  You should allow the user to use either uppercase or lowercase letters of combination of lowercase or uppercase.
  You should check if the user has entered invalid input or not and ask the user to re-enter.
  *Hint:* Think about writing an expression using relational and logical operators which checks if the correct pair of characters has been entered or not.

- For the time the call started, the user will enter the time in 24-hour notation.
  So 1:30PM is entered as 1330. You should check if the user has entered
invalid input (like 4500 etc.) or not and ask the user to re-enter. You can assume that user only enters some digits and never enters characters like alphabets or other symbols.

- The length of call shall be input as an int. You can assume the user rounds the length of call to a whole number. You can assume the user always enters a valid integer value here.

- Your program should use a loop that lets the user repeat the cost calculation as long as he/she wants.

As an example, the following is what your program should print out. The letters in blue represent what the user typed in. Notice that in this example, if the user enters invalid input then we ask them again until the correct input is provided. The user also responds by entering y or Y if he/she wants to do another calculation.

Enter the day of your call: mo
Enter the time your call started in 24-hr notation: 1415
Enter the length of your call in minutes: 20
The cost of your call is Rs. 480
Do you want to do another calculation? y
Enter the day of your call: sd
Bad_input. Enter the day of your call: Su
Enter the time your call started in 24-hr notation: 4000
Enter the time your call started in 24-hr notation: 6500
Enter the time your call started in 24-hr notation: 1230
Enter the length of your call in minutes: 40
The cost of your call is Rs. 360
Do you want to do another calculation? y
Enter the day of your call: tg
Bad_input. Enter the day of your call: hg
Bad_input. Enter the day of your call: tU
Enter the time your call started in 24-hr notation: 5678
Enter the time your call started in 24-hr notation: 3435
Enter the time your call started in 24-hr notation: 900
Enter the length of your call in minutes: 56
The cost of your call is Rs. 1344
Do you want to do another calculation? Y
Enter the day of your call: We
Enter the time your call started in 24-hr notation: 0500
Enter the length of your call in minutes: 12
The cost of your call is Rs. 180
Do you want to do another calculation? n
Press any key to continue
Write a program that takes two integers \( x \) and \( y \) from the user and a character which is either a * (for multiplication) or a / (for division) and prints:

The value of \( x \) multiplied with \( y \) if the user entered *
OR.
The value of \( x \) divided by \( y \) if the user entered / (Note: this is integer division therefore 13/3=4 and 5/9=0 etc.)

In your program, you are NOT allowed to use * or / operators to do multiplication or division. *Hint: You will need to use loops.*
You can only use +, -, ++, --, +=, -= operators.
You CANNOT use *, /, *=, /=.

- The user is allowed to enter negative numbers also and your program should print correct result. E.g. -3 * 4 = -12 and -52/4 = -13 etc.
- You can assume that the user always enters numbers when asked for \( x \) and \( y \) and never enters characters like alphabets or other symbols.
- When the user is asked to enter a character, you should check if it is a * or /. If the user enters any character other than these two, you should ask the user to enter again.
- Make sure your program prints helpful messages/prompts for the user when asking for input.
- Allow the user to repeat the calculation any number of times.

**Submission Instructions:**

- Make sure you have your name, roll number and assignment number, as a comment, at the beginning of your source code file.

- Use meaningful variable names in your program. Your code must be properly commented. There are marks for style and quality of coding.

- Instructions about how and where to submit your assignment will be posted the course website ( [http://suraj.lums.edu.pk/~cs192w06/](http://suraj.lums.edu.pk/~cs192w06/) ).

- Mandatory vivas will be conducted for this assignment. Information about the viva schedule will be communicated through the website by the course TAs.