

# Beginning C Programming for Engineers

## Homework Set 4

Name: \_\_\_\_\_

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1. Develop an algorithm to make iced coffee.
  - (a) Break this problem into several major steps.
  - (b) Refine one step of this algorithm into even simpler steps.
2. In homework set 3, problem 1, you wrote a program to compute triangular numbers  $T_n = \sum_{i=1}^n i$ , for  $n$  a positive integer. In this problem, you will change it to use functions.
  - (a) First write a function with this prototype:

```
int Triangle(int n);
```

The C expression `Triangle(x)` should compute and return the triangular number  $T_x$ . *The function `Triangle` itself should not print anything!* You might be able to create this function by taking your iterative solution for homework exercise 3.1 and placing it in a function body.

(We will give you an extra bonus point if you submit a solution that sensibly uses recursion.)

- (b) After you have this function, use it in a program. Your program should read in a number  $m$  and use your function to compute and print  $m$ ,  $m + 1$ ,  $T_m$ ,  $T_{m+1}$ , and  $T_m + T_{m+1}$ .
3. Write the functions `Minimum` and `Maximum`, each taking *two* integer parameters and returning the minimum or maximum, respectively, of their arguments. Now write a program that reads *five* integers from the keyboard using `scanf`, then uses your `Minimum` and `Maximum` functions to compute the minimum and maximum of the set of integers you entered. Your functions will probably need the `if` statement, but do not use an `if` statement in your `main` program.

This problem description is correct! You must find a way to exploit functions taking only two arguments to work with five numbers. *Hint: Suppose I were to give you a list of numbers, one at a time, and asked you to determine the maximum and minimum values. How would you do this?*