This lab investigates finding information such as the maximum and minimum of a set of reals (entered as decimals) using a `while()` loop. The numbers can be entered either from the keyboard or a datafile.

1. Make a copy of the sample program `max_min.cpp` and compile it changing the name of the executable to the basename `max_min`

   ```
g++ -g max_min.cpp -o max_min < cr >
```

   Run it (by typing)

   ```
max_min < cr >
```

   several times. The program expects non-zero decimal numbers as data. If you enter 0.0 the program takes this to mean end-of-data, stops accepting input, and prints out its results. We say that 0.0 is a `sentinel` value since it is a non-data item that is used to tell the program all the numbers have been entered.

2. It is tedious to enter a long list of numbers from the keyboard, especially if you are using mostly the same numbers and running the program several times. An alternative is to put the numbers in a textfile (you might call it `datafile.txt`) with the numbers separated by white space (i.e. spaces, tabs, or newlines). For readability, it may be best to put each number on its own line, ending with 0.0. You can then run the program, redirecting standard input from the keyboard to the file `datafile.txt` by typing

   ```
max_min < datafile.txt < cr >
```

3. Make a copy of the same program and modify it to instead compute the largest and smallest `absolute values` of the numbers. You will want to use the `fabs()` math function to take the absolute value, and, like the `sqrt()` function, this means you must have

   ```
#include <math.h>
```

   in your program (just like we did for the `quadratic.cpp` program). On some C/C++ implementations you may need to add the link option `-lm` to the compile line

   ```
g++ -g -lm max_min.cpp -o max_min < cr >
```

**Assignment** Write a program which performs the task described below and email me the pathname of your program in plain text; do not send an attachment. For example, you might say

   ```
My lab2 program is /usr/stu/demo/cs221/homewk2.cpp
```

Given a finite sequence of \( n \) real numbers \( \{x_1, x_2, \ldots, x_n\} \) we can compute the sequence of \( n - 1 \) absolute differences \( \{|x_2 - x_1|, |x_3 - x_2|, \ldots, |x_n - x_{n-1}|\} \). Note that you cannot compute the first absolute difference until two numbers have been entered. Write a program which will accept a finite sequence of non-zero reals (entered as decimals from either the keyboard or a datafile), use the value 0.0 as a sentinel for end-of-data, and which will compute (and print out) the smallest and largest absolute differences.