

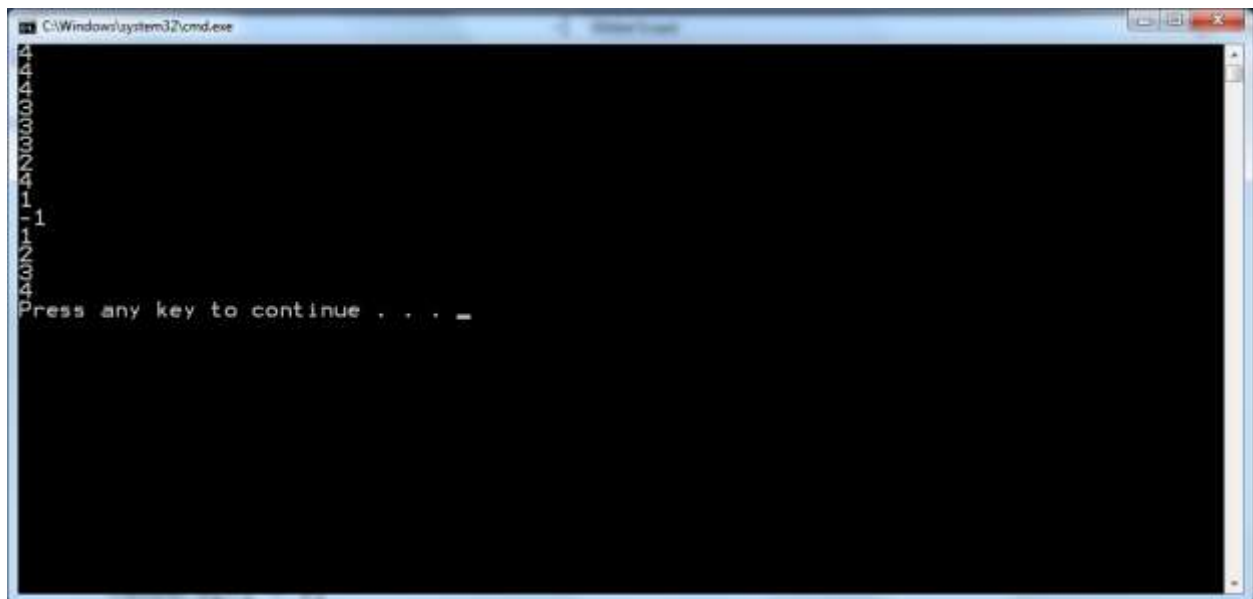
Thursday, August 1, 2019  
11:30 PM

## Number Filter

Write a program that will filter a list of non-negative integers such that all duplicate values are removed. Integer values will come from standard input (the keyboard) and will range in value from 0 up to 2,000,000,000. Input will be terminated by the special value, -1.

Once the input is read in you should output (to the screen) the list of numbers as a sorted list (smallest to largest) with one value listed per line where all duplicates have been removed. The primary difficulty with this program is that there are an enormous number of input values and an expected large number of duplicate numbers.

A sample run of the program is displayed below:



You may find it useful to use input/output redirection while testing your program so that you can have large input files. Recall that from the command line you can use the command:

```
my_program.exe <input.txt >output.txt
```

to redirect standard input so that it reads from the file `input.txt` instead and redirects standard output so that it outputs to the file `output.txt` instead of the screen. You can also write a program to generate input for your main program and you can avoid the input file altogether by using a pipe. The `|` character (shift backslash on most keyboards) will take the output of one program and use it as input for another program:

```
my_number_generator.exe | my_program.exe > output.txt
```

will run the `my_number_generator.exe` program and pipe all of the output from that program as input to the `my_program.exe` executable and then finally take the output from that program and redirect it to a file named `output.txt`.

All programs must include a comment section at the top of the program as outlined below:

```
/******  
Program:    <name of program>  
Author:     <your name>  
Date:       <date you finish the program>  
Time spent: <total amount of time spent on the project>  
Purpose:    The purpose of this program is to blah blah blah  
*****/
```