

Assignment #1 – Begin Programming in C++

Due: Sunday, 10/01/17, 11:59pm

Grading: Every assignments in this course is graded by demoing your work for 10 minutes with a TA. You are required to **meet with a TA within two weeks of the due date** to demo. You can schedule a demo with a TA on the [home page](#) in the far right column of the bottom table labeled "Grading Hours".

- **Demo Outside 2 Weeks:** Assignments that are not demo'd within the acceptable time period will be subject to a 50 point deduction.
- **Demo Late Assignments:** Late assignments must still be demoed within the two week demo period beginning from the assignment's original due date.
- **Missing a Demo:** If you miss your demo with a TA, you will receive a 10 point (one letter grade) deduction to that assignment for each demo missed.

Your job is to convince the TA that your program works correctly, i.e. show your TA how to use/break your program 😊

(90 pts) **Problem Statement:**

(20 pts) Write a C++ program that first prints the maximum and minimum values for the signed and unsigned ints, longs, and shorts using the macros from the climits library, <http://www.cplusplus.com/reference/climits>. Notice there is not a minimum unsigned! You should just enter the numerical literal for this information, and make sure you print proper messages for each min and max you are printing.

(62 pts) Now, write a program to calculate and print the maximum and minimum signed and maximum and minimum (which of course is a literal number, that you still need to assign!) unsigned number stored in n bytes, and **store the result in a variable** to print. You do not have to handle the user entering a number of bytes greater than 8.

Think about the equation from class and recitation to determine how many numbers can be represented in 8 bits with two possible choices for each bit. How are you going to express an exponent? In C++, you need to use a built-in function, `pow(base, exp)`, from the `cmath` library. For example:

```
#include <iostream>
#include <cmath>

using namespace std;

int main() {
    int num = pow(2,3);
    cout << "2^3 is: " << num << endl;
    return 0;
}
```

(8 pts) Now, insert statements to add 1 to the unsigned and signed maximum number stored in the variable after you calculate the answer, and print the result of increasing the variable by one. Do the same for the unsigned and signed minimum number calculated by subtracting one from the variable and printing the value afterward.

(10 pts) **Extra Credit**

Now, make sure you can handle and print error messages for numbers ≤ 0 and > 8 bytes from the user.

(10 pts) **Program Style/Comments**

In your implementation, make sure that you include a program header in your program, in addition to proper indentation/spacing and other comments! Below is an example header to include. Make sure you review the style guidelines for this class, and begin trying to follow them, i.e. don't align everything on the left or put everything on one line! http://classes.engr.oregonstate.edu/eecs/fall2017/cs161-001/assignments/161_style_guideline.pdf

```
/******  
** Program: numbers.cpp  
** Author: Your Name  
** Date: 09/24/2017  
** Description:  
** Input:  
** Output:  
*****/
```

Electronically submit your C++ program (.cpp file, not your executable!!!) by the assignment due date, using TEACH.

https://secure.engr.oregonstate.edu:8000/teach.php?type=want_auth