CIS 554 Homework 1

**Homework Objective**: Provide students with an opportunity to write a C++ program using the basic skills learned to date, including integer variables, simple operators, looping and input/output.

**Due Date:** Refer to Blackboard

**Description:** Adapted from the text:

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| A number of any base can be converted to decimal (base 10) by examining each of the digits in the number, starting with the least significant digit (right-most digit), and working to the left toward the most significant digit. Each digit has a value of BN-1, where B is the base, and N is the digit number. Additionally, the valid digits for any given base are B-1. So, for base 10 (decimal), the valid digits are 0-9. For base 2 (binary), the valid digits are 0-1. For base 8 (octal), the valid digits are 0-7. For clarity, the base is sometimes given with the number, so Octal 724 would be written as 7248. Note that 7288 would be an illegal number. To convert a number of base B to decimal, we simple perform the following summation:      Where N = number of digits in number  Where D = digit number  For example, to convert 1223 to decimal, examine the digits from right to left, and accumulate as follows:  (2 x 30) + (2 x 31) + (1 x 32) = 2 + 6 + 9 = 1710.  You can use the modulus and division operators to examine each digit from right to left. You will want to use integer variables in order for the modulus and division operators to work correctly for you.  Your program should test for the occurrence of invalid input and print an error to the screen. For example, if the user enters 123 and indicates that it’s a Base 3 number, that should generate an error.  For additional information regarding number conversion, refer to Appendix D. If you don’t have the text book, you can Google information about number conversions. |

In order to implement this problem, you must create a class called Convert, with separate Interface (declaration, convert.h file) and Implementation (definition, convert.cpp) files, as well as a separate program file (i.e.main.cpp). Your Convert class must have at least 1 public method for implementing the conversion to decimal So, you submit 3 files total; 2 for the Convert class, and main.cpp. Your program will ask the user for a number, as well as its base. Your program will then call the proper method of the Convert class to do the conversion to decimal, then display the answer. As discussed in class, the Convert class will be responsible to query the user for an input number.

**HINT**: To solve this problem, you MUST use the modulus (%) and divide (/) operators. For example, consider what happens if I take any number and modulus that number by 10.

13567 % 10 = 7 – that is, I get the least significant digit in the number (first digit on the right)

Now, consider what happens if I take that number and divide it by 10

13567 / 10 = 1356 – that is, I am left with the remaining 4 digits.

Now, consider doing modulus followed by division several times in a loop.

**Format:** Provide the information as follows:

1. Zip all the files together.
2. Upload the zip file to the Blackboard.
3. Please include your full name as part of the header in each source file.
4. Please append \_HW1 to the .zip file name (e.g. waclawski\_HW1.zip).