CS120 - Computer Science I
Lab 11 - Base Conversion - Spring 2014

The purpose of this assignment is to gain experience with converting numerical representations between various bases.

For this assignment you will create a C++ program that works as follows:

1. Read an integer value from `cin` which indicates the numerical base value of the number that will be read in the next step. We shall refer to this as `inbase`, the input base. This value can be between 2 and 16 inclusive. If your program encounters a value outside this range, it should print a message indicating such and terminate.

2. Read a string value from `cin` which is a value expressed in base `inbase`. This value will always be positive and will contain no leading sign (`'-'` or `'+'`) characters.

3. Your program should ensure that the characters of the input value read in step 2 are all valid digits for the specified base. For instance, if the input base value was 2, then the only valid digits are `'0'` and `'1'`. If your program encounters an input value containing any invalid digits, it should print a message indicating such and terminate.

4. Read any number of integer values. These values are output base values, again between 2 and 16 inclusive. For each valid output base value specified, print the value read in step 2 represented in the specified output base.

5. Your program should stop reading output base values when it encounters an output base value that is not within the range [2,16]. Your program should not terminate when it encounters an invalid output base value, but should proceed to step 1.

Internal Number Representation

The input values read in step 2 above should be stored in a C++ class called `InVal`. The `InVal` class should contain *at least* a method called `void PrintAsBase(int base)` which will print the given input value in the specified base.

Example Output
Here is a possible example output from your program. User input is underlined, everything else (except the '$' unix prompt) is output from the program.

```
$ ./a.out
2 10110 2 7 10 16 0
10110 (base 2) is...
     10110 (base 2)
     31 (base 7)
     22 (base 10)
     16 (base 16)
8 1010 10 7 16 0
1010 (base 8) is...
    520 (base 10)
    1342 (base 7)
    208 (base 16)
3 1010 2 10 9 5 1
1010 (base 3) is...
    11110 (base 2)
    30 (base 10)
    33 (base 9)
    110 (base 5)
1 010 2 1
error: invalid inbase 1.
program terminating.
$
```

When you have finished your program and have tested it, use the *cscheckin* command to turn in your program, and give a copy of the program code and results to your lab instructor.