**Professional Coding Challenges 10/24/2017**

1. Write a function called “multiply” that takes two integers and returns the product. You are NOT allowed to use the \* operator or any imported multiplication function. We will check your code.

Example:

Input: multiply(5, 6) Input: multiply(-1, 15) Input: multiply(-2, -7)

Output: 30 Output: -15 Output: 14

2. You are being sent a coded message in two parts, and must write a function to decode it. There are two rules that govern this code:

1. There are random digits interspersed among the strings that you must filter out.
2. Every second character of the original message has been placed in the second string.

Example:

Input: “c1dn4”, “o5ig”

Output: “coding”

3. Given two numbers, a “left” number and a “right” number where 0 <= left <= right, return the sum of all 1 occurrences in the binary representations of the numbers between and including “left” and “right”.

Example:

Input: 5, 9 Input: 1, 1

Output: 10 Output: 2

4. Given a string, count the number of instances of each letter (A-Z) and make a vertical histogram.

* Only count uppercase letters. Any other character should be ignored.
* Use \* to represent the number of characters.
* Order your output alphabetically.

Example:

Input: “A ANF 33JJJFIIM WaasdWWcM”

\* \*

\* \* \* \* \* \*

\* \* \* \* \* \* \*

Output: A F I J M N W

5. A number is polydivisible if the first digit is divisible by 1, the first two digits are divisible by 2, the first three by 3 and so on. Write a function that determines if a given integer is polydivisible in the given base.

If you are not sure what base is or how to convert a number to a specific base, take a look at this helpful article: www.cs.trincoll.edu/~ram/cpsc110/inclass/conversions.html

Example:

Input: 210, 10 Input: 123220, 6

Output: False Output: True