UCR - CS 14

Assignment 1

Deliverables: Create a single pdf file that contains your answers and your C++ code. Then create a zip file that contains this pdf file along with all your code source files. Submit this zip file in iLearn.

Deadline: 10/10/2019 11:59 pm.

Exercise 1:

A. Using only core C++ (no special libraries, except STL vector or string if you want), write a C++ program that allows a user to input a string and

(a) Checks if the expression is a valid polynomial. Parentheses or negation are not allowed. Spaces should be ignored. E.g., the following are valid
   i. n^2+2*n+5
   ii. 2*n + 4.54* n^5 +4 +5*n

   and the following are invalid
   iii. n^3n
   iv. n^4.2
   v. 5n
   vi. n^3 -3*n

(b) If the polynomial is valid, outputs its big-Oh class. E.g., for (ii) above it is O(n^5).

B. If the length of the input expression is m chars, what is the big-Oh complexity of your program with respect to m?

C. What if we require that there is only one term for each degree? That is, (ii) above is invalid because it has two terms for degree 1 (n^1).

Modify your program accordingly.

What is the asymptotic complexity of the new program?

Throughout the exercise, make any assumptions necessary.

Exercise 2:

Given an array A of n integers and an integer s, find a subset of the integers in A such that their product is s.

A. Write C++ function.

B. Compute asymptotic complexity.