**CSci 230 (Fall 2019)**

Programming Assignment 1

(Due in 2 weeks from the posting date)

(Hand-in should include the code files and the output of the programs)

1. You are offered with a partial specification of a 4x5 2-D array. The partial specification is shown as follows. (Only the first row and the first column are specified.)

-1 -2 -3 -4 -5

-6

-11

-16

You are required to write a C program to perform two tasks.

* 1. First, to write a sequence of C codes to generate the values for the unspecified elements in the 4x5 2-D array. The array is called A. The row index is denoted by i, and column index is denoted by j. i, j starts from 0. Namely, for first row, i = 0. For first column, j = 0. The values of the unspecified elements are defined as

A[i][j] = A[i-1][j]\*A[i][j-1] for i > 0 and for j > 0.

After all elements in the 4x5 2-D array are fully specified, print out the content of the entire 4x5 2-D array according to the format shown below.

j = 1 2 3 4 5

------+----------------------------

i = 1 | -1 -2 -3 -4 -5

2 | -6 ……..

3 | -11 ……..

4 | -16 …….

* 1. Next, to transpose the 4x5 2-D array generated in step a. After transposing, the original 4x5 2-D array is turned into a 5x4 2-D array. Display the 5x4 2-D array according to the format shown below.

j = 1 2 3 4

------+----------------------------

i = 1 | -1 -6 -11 -16

2 | -2 ……..

3 | -3 ……..

4 | -4 …….

5 | -5 …….

1. Reversed Tree Traversal.

Modifying the tree traversal C program shown in the folder of C Programming Review to do reversed tree traversal as defined below.

Reversed PreOrder: Root, Right, Left.

Reversed InOrder: Right, Root, Left.

Reversed PostOrder: Right, Left, Root.

The tree is:

Root = 1, Left(1) = -2, Right(1) = -3;

Left(-2) = 4, Right(-2) = 5;

Left(-3) = 6, Right(-3)= 7;

Left(5) = -8, Right(5)= -9;

Left(7) = 10, Right(7) = 11;

Left(11) = -12, Right(11) = -13;

Left(-13) = 14.

You program should output the printed sequence of node IDs (positive or negative) according to the required order.