210CT Week 5 Coursework Tasks
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LEARNING OUTCOMES

1. Understand and apply pointers.
2. Understand the array and linked list data structures, together with the difference between their operations (such as insertion, deletion).

BASIC/INTERMEDIATE TASKS

1. Given a sequence of n integer numbers, extract the sub-sequence of maximum length which is in ascending order. Example input: L = [1,2,3,4,1,5,1,6,7] Output: [1,2,3,4]

   Why? 1,2,3,4 has four elements, while 1,5 has two and 1,6,7 has three. Hence, 1,2,3,4 is of maximum length.

2. Implement the node delete function in the programming language of your choice based on the template provided.

ADVANCED TASK

1. Write a function to calculate the kth power of a square matrix, using pointers to access to the elements of the matrix. The resulted matrix will be displayed in natural form.
2. Using the model of a circular single-linked list, implement the following scenario: N children stand in a circle; one of the children starts counting the others clockwise. Every Nth child leaves the game. The winner is the one who remains. Notes: Read the number of children, the childrens' names and the one starting to count from the standard input.

   Input: 4; Names: Diana, Michael, David, Mary Start: Diana

   Winner: Michael

READING

Parlante, N. (2001). Linked List Basics.