Course: Data Structures (CSE CS203A, 114-1)
Quiz II: Array, Linked List, Stack and Queue
October 21, 2025, 16:30~17:00

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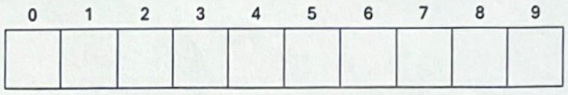
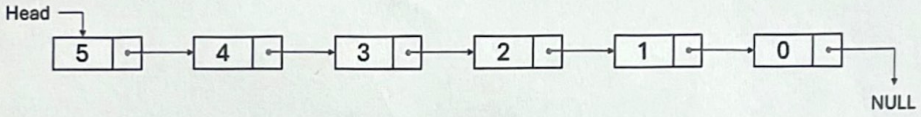
Data Structures: Visualization

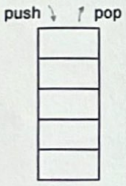
(1) Array



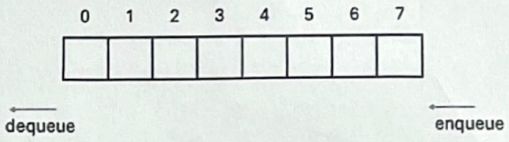
(2) Linked List



(3) Stack



(4) Queue



Q1: (30 pts; 10 pts for each) **Describe the mechanism of the function**
MoveTo(node *head, node *target, node*destination)

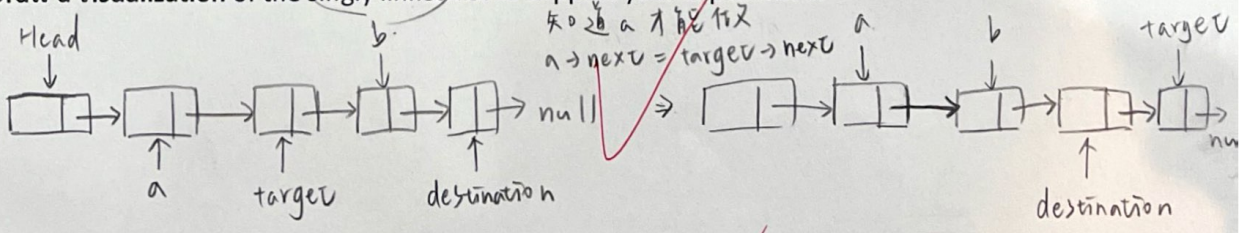
A1: Write a short paragraph explaining how the **MoveTo** function works (you may answer in English or Mandarin).

把 target move 到 destination 後

① Are there any **additional variables** required? If so, explain why they are necessary.

MoveTo() 要將此 linked list 中的 target node 串接到 destination node 後
需要 additional variable 才能完成此操作 例如：target node 的 前一個 node
因為將 target node 移出後需把 前一個 node 的 pointer 指到 下一個 node。

② **Draw a visualization** of the singly linked list to support your explanation.



③ Is there any **variation of a linked list** (e.g., doubly linked list or circular linked list) that can simplify or improve this operation?

就能透過 node 知道 前後 pointer 的關係

doubly linked list，因為找到 target node 跟 destination node 後

Q2: (40 pts, 10 pts for each) **Definition of Data Structures**

Define the following data structures and list their fundamental operations.

A2:

① Definition of "Stack"

最先被 push 進 stack 內的資料會最後才被拿出來

② Definition of "Queue"

資料取出的順序依照被放入的順序，最先進入的資料最先被拿出

ADT ③ Preliminary operations of "Stack"

top：資料放入與拿出的位置　　push：放入資料

bottom：stack 一開始的位置　　IsFull：空間是否滿了

pop：拿出資料　　IsEmpty：stack 內是否無資料

④ Preliminary operations of "Queues"

rear：資料放入的位置　　enqueue：放入資料

front：資料拿出的位置　　dequeue：拿出資料

IsFull：空間是否滿了　　IsEmpty：queue 內是否無資料

Q3: (30 pts) **AI Copilot Application**

Choose **up to two** data structures from the visualization list above.

Compose a **single prompt (within 300 words)** that you would use with an **AI Copilot** to explore or learn advanced concepts related to your chosen data structures.

A3:

linked list，

除了 singly，doubly，circular 以外還有沒有其他變形，

每個變形在生活中有沒有實際例子可以說明，我能如何簡單地實作出來。我想把 linked list 結合 stack 去實作，可以如何開始，應該要把資料的出入口設在 linked list 的 Head 還是 tail 選擇的標準是什麼，要考量到哪些面向？

-10+5