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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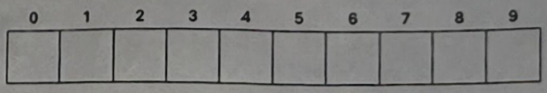
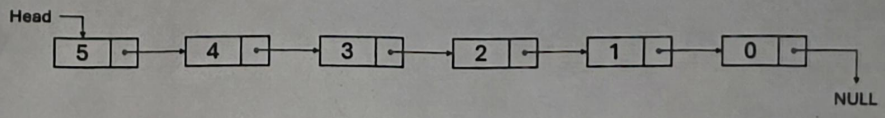
Data Structures: Visualization

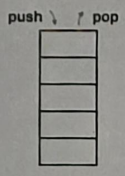
(1) Array



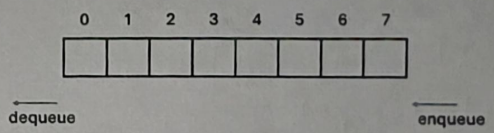
(2) Linked List



(3) Stack



(4) Queue



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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).

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

prevTarget：儲存 target 前的節點，方便分離
destination：標記 target 新的位置
MoveTo() 移動 target 到新的位置，這個操作為指標操作，不是資料交換。

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

prevTarget → next == target;
prevTarget → next = target → next;
destination → next = target;

② Target is next to the distination
→ handle pointer adjustment carefully.

Edge cases：① Target node is the head → use a dummy node before head

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?

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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"

Stack 遵循後進先出的原則，最後加入的元素會先被移除。

② Definition of "Queue"

Queue 遵循先進先出的原則，最先加入的元素會先被移除。

③ Preliminary operations of "Stack"

push()　　isEmpty()
pop()　　isFull()
peek()/top()

④ Preliminary operations of "Queues"

enqueue()/delete()　　isEmpty()
dequeue()/addQ()　　isFull()
front()

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:

比較 Array 和 Linked list 之間在執行不同任務時，何者更有效率，或者在執行時會有什麼樣的問題及風險，例如資料丟失或資訊洩漏，和當我在面臨這些狀況時，我該如何去修正，完善我的程式碼。

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