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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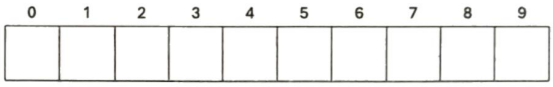
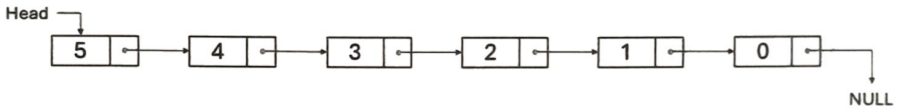
Data Structures: Visualization

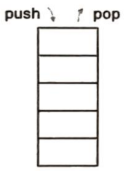
(1) Array



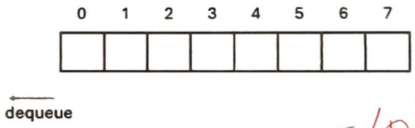
(2) Linked List



(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)**

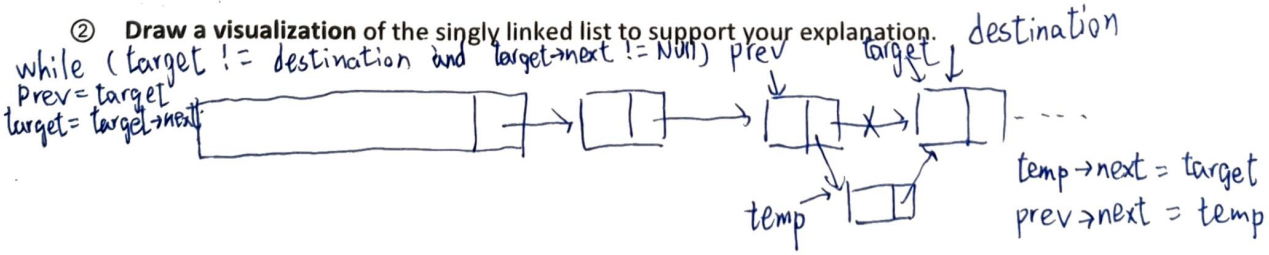
target：移到 destination後

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.

node *prev 用以 store *target 的前一步
(target會從 head 一直往下找直到右並到 destination，
prev 隨之更新. 這樣要進一步執行 insert / delete 時
可以直接調用 prev 幫忙

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?

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"

Last In First Out ✓

② Definition of "Queue"

First In First Out ✓

③ Preliminary operations of "Stack" 有哪些 ADT?

① pop 把最後放進的容器 throw out ③ size 容器大小 (int)

② push 把元素放進容器 ④ empty 是否為空 (bool)

④ Preliminary operations of "Queues"

①enquene, ③insert：插隊 ④ size 隊伍長度 (int)

從尾巴 extend 隊伍

②dequene 從尾巴縮減隊伍 ⑤ empty 是否為空 (bool) -1

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

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

Compose a **single prompt (within ~~300~~ 150 words)** that you would use with an **AI Copilot** to explore or learn advanced concepts related to your chosen data structures.

A3:

Linked List: Help me further describe the logics of Linked List in data structure. Your response should include: 1. what would compile behave when some ~~can~~ link nodes created.

2. In what condition do I need to aware of "head node lost"?

3. 'continue' to 2., if I accidently break the head node, are there any methods to fix this issue?

-1

Stack: when should I extend the size of stack?

half of it is full or completly full?