WEEK 07

STACK & QUEUE

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1 Problem 1 – Stack

Implement a stack of integer with the following methods:

1. Init an empty stack
2. Push/add an integer to stack
3. Pop/remove an integer from stack
4. Check whether a stack is empty or not
5. Make a stack empty
6. Get the number of elements in the stack

1.1 Problem 1.1 – Stack – v1

Using a dynamic allocated array

```cpp
class Stack
{
    private:
        int *data;
        int top;
        int size;
};
```

1.2 Problem 1.2 – Stack – v2

Using a singly linked list

```cpp
class Stack
{
    private:
        Node *pHead;
};
```

2 Problem 2 – Queue

Implement a queue of integer with the following methods:

1. Init an empty queue
2. Enqueue/add an integer to queue
3. Dequeue/remove an integer from queue
4. Check whether a queue is empty
5. Make a queue empty
6. Get the number of elements in the queue

2.1 Problem 2.1 – Queue – v1

Using a dynamic allocated array

```cpp
class Queue
{
    private:
            int *data;
            int in;
            int out;
            int size;
};
```

2.2 Problem 2.2 – Queue – v2

Using a singly linked list

```cpp
class Queue
{
    private:
            Node *pHead;
            Node *pTail;
};
```

3 Problem 3 – Application of stack

1. Convert an unsigned integer from decimal base to binary base, and vice versa
2. Convert an unsigned integer from decimal base to hex base, and vice versa

4 Problem 4 – Polish notation

Compute value of an expression

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Problem 1.1, 2.1

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Problem 1, 2, 3

Problem 4: Bonus