Computer Programming 1 Lab

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Outine

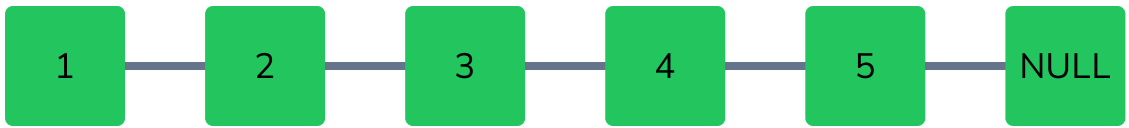
- Link list
- Debug

Linked List

```
1   typedef struct node Node;
2
3   struct node {
4     int value;
5     Node* nextPtr;
6   }
```

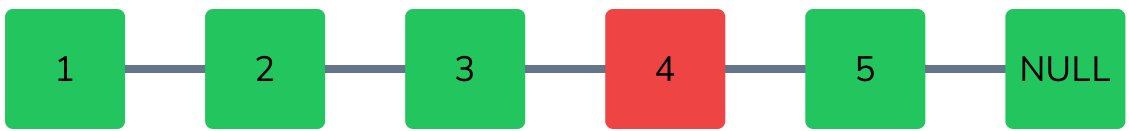
- other concept
- insert
- delete
- remove

Linked List - other concept



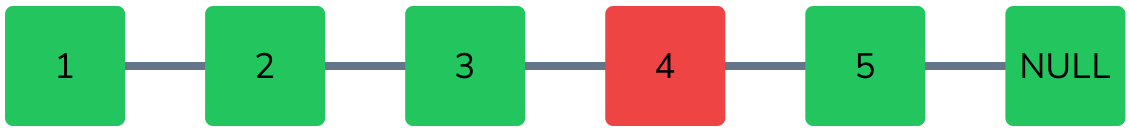
Use a dummy header to avoid strange pointer problem

Linked List - insert




```
1   Node* newPtr = malloc(sizeof(Node));
2   newPtr -> value = 0;
3   newPtr -> nextPtr = currPtr -> nextPtr;
4   currPtr -> nextPtr = newPtr;
```

Linked List - delete




```
1   Node* tmpPtr = currPtr -> nextPtr;
2   currPtr -> nextPtr = tmpPtr -> nextPtr;
3   free(tmpPtr);
```

Linked List - remove

```
1   while(ptr ≠ NULL) {
2     Node* nextPtr = ptr → nextPtr;
3     free(ptr);
4     ptr = nextPtr;
5   }
```

Whenever use malloc, use free then.

Debug

- IO first, then Logic
  - 避免有時候邏輯寫完發現input根本就是錯的。
  - 處理IO時，處理一個程序print一次，循序漸進。
- TLE
  - 某個while沒檢查到，ex: recursive, i–
  - 用斷點 `while(1)` 丟oj
- Segmentation fault
  - array index錯誤存取，link list存取 `NULL` 的 `nextPtr`
  - 費神，用以上方法逐步排解
- Stack Overflow
  - 遞迴過深，檢查終止條件

Debug

- array 開不起來
  - Stack vs heap
  - 用`malloc`或用全域變數
- local vs ghost vs oj
  - gcc version
  - `llvm` vs `gcc`

Debug friend - GDB

- Vscode instruction: WSL setup
- You can also use `gdb` command: GeekForGeeks.
- Other platforms have other good tools.

No exercise this year

END