

**CS2413: Data Structures
Fall 2021**

Homework #2

- Full name only: _____
- Release date: Sept 3rd, 2021 (Friday)
- Due date: **Sept 16th, 2021 (Thursday) before midnight, 11:59 PM**
- It should be done INDIVIDUALLY; Show ALL your work; Submit your source code and results through the Blackboard.
- Total: 20 pts

I. Write a program that can insert, delete, search, and print nodes using single and double linked lists. Here is a set of requirements to follow:

- Type the homework number and your full name at the top in your source code.

```
/* Homework #2, James Bond */
```

- Your program should be a menu-driven and execute the chosen operation. If you type 12, then exit the program. An example of menu is below. Here, IH (Insert Head), IT (Insert Tail), DH (Delete Head), DT (Delete Tail), SD (Search & Delete), PS (Print Single Linked List), and PD (Print Double Linked List).

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose?

- Each node consists of two (single linked list) or three (double linked list) components: value (integer or character), pointer to previous node (double linked list only), and pointer to next node.
- Display an error message when a node to be searched or deleted does not exist. Or try to delete a node in the empty list.
- Show ALL your work. For example,

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 0 a

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 1 b

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 0 c

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 5

c a b

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 4 b

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 5

c a

M E N U

```
SLL: IH(0), IT(1), DH(2), DT(3), SD(4), PS(5)
DLL: IH(6), IT(7), DH(8), DT(9), SD(10), PD(11)
Exit Program (12)
```

Choose? 4 d

There is no such node in the list!

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2. Please refer source codes in the textbook, Figs. 3.2 (pp. 78) and 3.10 (pp. 91).

3. Submit your source code and results (e.g., screen copy) through the Blackboard before the due date, Sept 16th, 2021 (Thursday) before midnight, 11:59 PM. The TA will build and run your source code and test with a random input.

- Source code – The file name should be “your name + homework number”, e.g., james_bond_2.cpp
- Results (e.g., screen copy)