

## IF184202 Data Structure (IUP)

# Midterm Exam

Starting date: 6 March 2020  
 Deadline: 13 March 2020, 23:59 WIB. **Penalty: 0.15% of grade/minute of tardiness.**  
 Exam type: Open  
 Send to: MM Irfan Subakti <yifana@gmail.com>  
 CC to Irham M Fadhil <Irham.mfadhil@gmail.com> with the subject: IF184202\_DATAST\_IUP\_MID\_StudentID\_Name  
 File type and format: A zip file containing all of the .cpp source files & the declaration  
 Filename format: IF184202\_DATAST\_IUP\_MID\_StudentID\_Name.ZIP

### Instruction

Please do these steps as in the following.

1. Complete a program below in C++, namely 01\_deque\_transverse\_[your\_name].cpp. [MEDIUM] [30 points]  
 Code:

```
#include <iostream>

using namespace std;

typedef struct snode_t { // node
    char data, direction;
    int step;
    struct snode_t *next;
    struct snode_t *prev;
} node;

typedef struct dlist_t { //deque
    unsigned _size;
    node *_head;
} linkedList;

bool slist_isEmpty(linkedList *list) {
    return (list->_head == NULL);
}

void slist_pushBack(linkedList *list, char direction, char data,
int step)
{
    //push back new data
}

void transverse (linkedList * myList){
    //transverse the list
}

int main()
{
    linkedList *myList = new linkedList;
    myList->_head = NULL;
```

```

char direction, data;
int step;
do{

    cin>>direction>>step>>data;
    slist_pushBack(myList, direction, data, step);
}while (direction!='0');

transverse(myList);

return 0;
}
    
```

**Input:**

**Direction Step Data**

- direction is the direction to transverse next; value: 'b' for backward or 'f' for forward
- step is the step to the direction; for example, b 5 means transverse 5 nodes backwards
- data is the data for the node
- The program will stop when the direction is 0

**Sample input:**

```

f 3 s
f 3 k
f 4 r
b 1 t
f 3 d
f 3 t
b 5 u
b 2 a
0 0 0
    
```

**Output:**

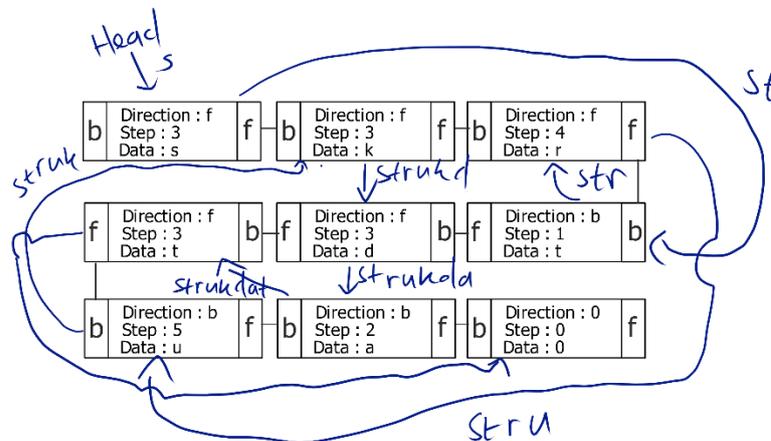
Print the data which has been taken from the transversal.

**Sample output:**

```

strukdat
    
```

**Illustration:**



2. Make a program namely `2_odds_and_even_[your_name].cpp`. Sort the number that has been input. Output the even number by ascending order, then the odd one by descending order.

PS: You must use the linked list on this problem. Don't use arrays [MEDIUM] [30 points]

**Input:**

The first line is N, how many test cases. And then the following N row is the number has to be sorted

**Output:**

Every number which already sorted by criteria above, output it by line.

**Sample input:**

```
10
4
32
34
543
3456
654
567
87
6789
98
```

**Sample output:**

```
4
32
34
98
654
3456
6789
567
543
87
```

3. Code the following task on a program that reverses string using linked list named `03_reverse_string_[your_name].cpp`. [EASY] [20 points]

**Sample input:**

```
practice makes a man perfect
```

**Sample output:**

```
perfect man a makes practice
```

4. Complete this following code, namely 04\_remove\_string\_[your\_name].cpp where remove\_duplicate() is a function to remove the node with the same data on the list. [EASY] [20 points]

```
//linkedlist

void remove_duplicate (linkedList * myList){
    //remove duplicate data
}

int main()
{
    linkedList *myList = new linkedList;
    myList->_head = NULL;
    int data;
    do{

        cin>> data;
        slist_pushBack(myList, data);
    }while (data!=-1);
    print_linkedList(myList);
    remove_duplicate(myList);
    print_linkedList(myList);
    return 0;
}
```

**Sample input:**

```
1
2
3
4
1
5
6
3
2
-1
```

**Sample output:**

```
1 2 3 4 1 5 6 3 2 -1

1 2 3 4 5 6
```

5. To avoid plagiarism/cheating, every student needs to pledge and declare, then she/he must submit her/his **signed pledge and declaration** as in the following. Failed to do so will be resulted in getting 0 (zero) grade. Attach the **scanned/photo** of your *declaration* in your report.

“By the name of Allah (God) Almighty, herewith I pledge and truly declare that I have solved midterm exam by myself, didn’t do any cheating by any means, didn’t do any plagiarism, and didn’t accept anybody’s help by any means. I am going to accept all of the consequences by any means if it has proven that I have been done any cheating and/or plagiarism.”

[Place, e.g., Surabaya], [date, e.g., 13 March 2020]

<Signed>

[Full name, e.g., Ayu Damayanti]  
[StudentID, e.g., 05111940000xxx]

6. ZIP the files of 01\_deque\_transverse\_[your\_name].cpp, 2\_odds\_and\_even\_[your\_name].cpp, 03\_reverse\_string\_[your\_name].cpp, 04\_remove\_string\_[your\_name].cpp and your declaration (e.g., Declaration.PDF) into 1 (one) only .ZIP file, namely IF184202\_DATAST\_IUP\_MID\_StudentID\_Name.ZIP. Send this .ZIP file to yifana@gmail.com and CC-ed to Irham Muhammad Fadhil <irham.mfadhil@gmail.com>.
7. Have a lovely day, guys! Good luck! 😊