Programming and Data Structures Laboratory | 2021-22 Autumn semester, Section 20
Assignment 9 | March 08, 2022

Submission instructions

* Submit one .c file for each part of the assignment. Each of your .c files should be named as:

<your roll number>_A<assignment number>_<part number>.c

For instance, if your roll number is 21CS10023, and if you are presently doing Assignment 9 which has 2 parts, then you should submit 2 separate .c files named as:
21CS10023_A9_1.c   21CS10023_A9_2.c

* Submissions must be through the course Moodle, before the end of Lab session (11:55 AM). Late submissions will be penalized / not accepted.
* Try to think how you can solve a problem efficiently. A program that solves the problem efficiently will get more credit.
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1. [25 Marks] Write a function to reverse a linked list with 5 values [entered by the user], where the value at each node is an integer. While you create the linked list by taking input from the user, assume you insert the elements at the end of the list. Don't just print in reverse order. You have to actually reverse the original linked list, whereby the last node will become the head node.
Example output:
```
Enter number 0: 11
Enter number 1: 12
Enter number 2: 13
Enter number 3: 14
Enter number 4: 15

Original List: 11 12 13 14 15
Reversed List: 15 14 13 12 11
```

2. [25 Marks] Declare globally a structure named "stu" that has the following attributes:
name of a student (character string);
marks (integer).
Take as user's input the number of students and their names and marks in non-decreasing order of marks. Dynamically allocate a 1D array a[] and store these records in a[].
Write a function named "binary_search(...)" to search the record with the smallest index j such that the marks in a[j], a[j+1], ..., a[n-1] are no less than some cut-off marks (user input). This function is not exactly binary search taught in the class but a modified version. Print the records a[j], a[j+1], ..., a[n-1].
Example output:
```
Enter #students: 3
Enter the names and marks:
Bhanu      17
Vishnu     19
Aayush     21

Enter the cut-off marks: 15

Bhanu      17
Vishnu     19
Aayush     21
--------------------------------
Enter #students: 3
```

Enter the names and marks:
Bhanu   17
Vishnu   19
Aayush   21

Enter the cut-off marks: 19

Vishnu   19
Aayush   21

Enter #students: 3
Enter the names and marks:
Bhanu   17
Vishnu   19
Aayush   21

Enter the cut-off marks: 21

Aayush   21

Enter #students: 3
Enter the names and marks:
Bhanu   17
Vishnu   19
Aayush   21

Enter the cut-off marks: 25

Empty!

Enter #students: 9
Enter the names and marks:
Bhanu   17
Vishnu   19
Aayush   21
Raj   35
Samboji   39
Shikha   40
Satyam   40
Hardik   42
Vaibhav   49

Enter the cut-off marks: 40

Students with at least cut-off marks:
Shikha   40
Satyam   40
Hardik   42
Vaibhav   49