

❖ *Define all the necessary function in the class to solve all of the problem. To perform the following task generate the driver (main) file. Upload all of your cpp, h and main file in canvas. Solve the problem 2 using linked list and problem 3 using array.*

❖ *Use Unsorted list (linked list) class to solve problem 1*

1. You are given two sequences of integers arranged in ascending order. Your task is to combine the sequences into one ascending sequence. In order to get full marks, you have to make sure that the time complexity of combining two sequences is $O(N)$. You can safely assume that no integer will be repeated. Input starts with a positive integer m which specifies the number of elements in the first sequence. Next m values are the elements in the first sequence. The next positive integer n specifies the number of elements in the second sequence. Next n values are the elements in the second sequence. The output is the combined sequence.

Input Values:

$m=10, n=12$

List1: 1 5 6 10 14 20 25 31 38 40 (don't take user input)

List2: 2 4 7 9 16 19 23 24 32 35 36 42 (don't take user input)

Expected Outputs: 1 2 4 5 6 7 9 10 14 16 19 20 23 24 25 31 32 35 36 38 40 42

2. [Hints: take help from sorted linked list lab manual; multiple argument for template is allowed. i.e template <class it1, it2, it3>] Write a class **studentInfo** that represents a student record. It must have variables to store the student ID, student's name and student's CGPA. It also must have functions insertStudent to insert data, DeleteStudent to delete data with specific ID, RetrieveStudent to check if data exist or not and print function to print all the data.

Perform the following task in driver file:

- Create a list of objects of class studentInfo
- Insert 5 student records (don't take user input)
 - 15234 Jon 2.6
 - 13732 Tyrion 3.9
 - 13569 Sandor 1.2
 - 15467 Ramsey 3.1
 - 16285 Arya 3.1
- Delete the record with ID 15467

- Retrieve the record with ID 13569 and print whether found or not along with the entire record.

Expected Output:

Item is found

13569, Sandor, 1.2

- Print the list
 - 13569, Sandor, 1.2
 - 13732, Tyrion, 3.9
 - 15234, Jon, 2..6
 - 16285, Arya, 3.1

3. [Hints: take help from unsorted list (array) lab manual. Column size fixed, three] Write a class TimeStamp that represents a time of the day. It must have variables to store the number of seconds, minutes and hours passed. It must have functions insertTime to insert data, DeleteTime to delete data with specific timestamp. It also must have a function to print all the values.

Perform the following task in driver file:

- Create a list of objects of class TimeStamp
- Insert 5 time values in the format hhmmss (don't take input from user)

15 34 23

13 13 02

12 45 43

17 36 25

20 02 52

- Delete the timestamp 12 45 43
- Print the list

15:34:23

13:13:02

12:45:43

17:36:25

20:02:52