**Module 23.5 Practice Day 2**

1 Given a stack with push(), pop(), and empty() operations, delete the middle of it without using any additional data structure. Note that, (n/2) + 1 th Element is the middle number.

Expected Time Complexity: O(n)

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| --- | --- | --- | --- |
| Sample | Input | Output | Explanation |
| 1 | 5  1 2 3 4 5 | 1 2 4 5 | (5/2)+1=3rd element is deleted |
| 2 | 6  1 2 3 4 5 6 | 1 2 3 5 6 | (6/2)+1=4th element is deleted |

Link: <https://www.youtube.com/watch?v=mxrBibfna7A&ab_channel=GeeksforGeeks>

2 Given an array of elements, the task is to sort these elements using a stack.

Expected Time Complexity: O(n\*n)

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| --- | --- | --- |
| Sample | Input | Output |
| 1 | 7  8 5 7 1 9 12 10 | 1 5 7 8 9 10 12 |
| 2 | 8  7 4 10 20 2 5 9 1 | 1 2 4 5 7 9 10 20 |

3 Given an array arr[] and a number k. The task is to delete k elements which are smaller than next element (i.e., we delete arr[i] if arr[i] < arr[i+1]) or become smaller than next because next element is deleted.

Expected Time Complexity: O(n^2)

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| --- | --- | --- | --- |
| Sample | Input | Output | Explanation |
| 1 | 3  3 100 1  1 | 100 1 | arr[0] < arr[1] means 3 is less than 100, so delete 3. K is 1, thus 1 element deletion is completed. |
| 2 | 5  20 10 25 30 40  2 | 25 30 40 | First we delete 10 because it follows arr[i] < arr[i+1]. Then we delete 20 because 25 is moved next to it and it also starts following the condition. K is 2, thus 2 element deletion is completed. |

**Mid Term Lab Exam Syllabus:**

1 Array

2 Linked List

3 Stack (Basic Operations and Application)