Department of Computer Science and Engineering
Indian Institute of Technology Jodhpur
CSL2020 - Data Structures and Algorithms

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Lab - 7

1. Write a **Python program** to construct a min-heap using an array (max_size = 100). Display a menu for the user to provide input, and call appropriate function with inputs provided. Assume that all the values in the heap are distinct and positive integers.

   - On menu input 1, call a function to receive a sequence of numbers in the following format

     n m1 m2 ... mn

     and create a min-heap with n positive integers m1, m2, m3, ..., mn. You should first fill the array with the integers m1, m2, m3 ...., mn and then convert this array into a min-heap.
   - On menu input 2, call a function to receive an integer **m** and insert in the existing min-heap. If the heap does not exist then print the error message "Heap does not exist".
   - On menu input 3, call a function to delete minimum element from the existing min-heap. If the heap does not exist then print the error message "Heap does not exist".
   - On menu input 4, call a function to receive an integer **m** and delete it from the existing min-heap. If the heap does not exist then print the error message "Heap does not exist". If **m** is not present in the heap then print the error message "Integer not found".
   - On menu input 4, call a function to sort the array containing the existing min-heap in descending order using the following steps
     1. As the heap contains the smallest element at root, swap it with the last item of the heap.
     2. Reduce the size of heap by 1 (by not considering the last element).
     3. Heapify the reduced heap.
     4. Repeat above steps till the size of the heap is greater than 1.

   Print the content of array after each function call as output, if there is no error message.