19CSE302 – Design and Analysis of Algorithms

Lab Assignment 2

Exercises on Sorting

Solve the problems with the most efficient solutions.

1. Generate 1000 integer random numbers between 1 and 10000. Compare the sorting algorithms learnt in the class using the same set of numbers generated. Plot the time taken for them to complete the process.
2. Given 'm' sorted lists/ arrays, each containing 'n' elements, print them efficiently in sorted order

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[10, 20, 30, 40]
[15, 25, 35]
[27, 29, 37, 48, 93]
[32, 33]
```

3. Given an array of size N, find the K largest elements in the array where K<<<N.
4. Given a set of activities, along with the starting and finishing time of each activity, find the maximum number of activities performed by a single person assuming that a person can only work on a single activity at a time.

```
Input: Following set of activities

(1, 4), (3, 5), (0, 6), (5, 7), (3, 8), (5, 9), (6, 10), (8, 11),
(8, 12), (2, 13), (12, 14)

Output:

(1, 4), (5, 7), (8, 11), (12, 14)
```

5. Given a set of intervals, print all non-overlapping intervals after merging the overlapping intervals.

```
Example:
The set of intervals are:
(1,4) , ( 2,5) , (7,8) , ( 6,9).
After merging these intervals, the intervals will become
(1, 5), (6, 9).
```