Department of Computer Science and Engineering
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CSL2020 - Data Structures and Algorithms

Lab - 9

1. In previous lab we used Insertion sort to improve Quicksort performance. We will continue our experiments with Insertion sort in this lab too. Consider the following problem.

   In one of the WHO's reports happiness scores (x) of all the countries were released. The scores were in the range of 0 to 1 (floating point numbers) where 1 representing happiest country. It turns out that the scores are uniformly distributed. Our objective is to sort the list of countries in terms of happiness score in descending order.

   To solve the problem, we will take inspiration from hashing with chaining idea. We will linearly map all the scores to an array of lists, *i.e.* $f(x) = mx$, where m represents size of the array and subsequently sort the individual lists using Insertion sort. Finally, we need to concatenate all the sorted lists to get the complete list of sorted scores.

   Your **Python** program will receive input in the following format.

   N m n1 n2 n3 n4 n5 ... nN

   where the first number **N** is the length of sequence of scores **n1 n2 n3 n4 n5 ... nN** and **m** is the mapping factor.

   Print the content of array after mapping, after sorting individual lists, and after concatenation as outputs.
   [**Hint: Bucket sort**]