Programming Assignment 2

Due: 9/26/2022

The objective of this assignment is to explore sorting algorithms and benchmark for the running times.

Link to the video description of the assignment:

https://csulb.zoom.us/rec/share/r2MBszcPmpAHrxK9e_-
VTZCXsueB0x47Q8NK5XArZTbewYuGsm5iFgI0s-hDx2xl.TKTvbsYFZAcu3w-p

Passcode: 8qB!&HQ6

Assignment

1- Implement three programs for three sorting algorithms: InsertionSort , QuickSort and, MergeSort.
2- Each of these algorithms accept an array of integer as input and return an array of arrays. The first element of your output is a descending sorted array of input and the second element of output is the running time of the algorithm in seconds.
   For example:
   Input = [2,3,4,1]
   Output = [[4,3,2,1], 2]
3- Programs use four inputs:
   a. A descending sorted array with 1000 elements
   b. An ascending sorted array with 1000 elements
   c. A randomly generated array with 1000
   d. A randomly generated array with 100000
4- Run your algorithms for each of four inputs, measure the running time of algorithms.
5- Report the result using a table or chart.

Note: An example of the code is given to you for bubble sort please run it and do your codes the same way

What to submit?

1- Write 3 programs for each algorithm. Please name your programs as follows:
   a. insertionsort_yourname.py
   b. quicksort_yourname.py
   c. mergesort_yourname.py

2- Your programs should be run as follows:
   Insertionsort_youname.py inputtype, elements_count ,seed
   Inputtype: is either a,b,c . Letters refer to the type of your input array described in the previous section.
   - Elements_count: The number of elements in input array
   - seed: is used only for the random base inputs that guarantees I get the same result of random array so I can grade your code based on it.
   Example1: python insertionsort_yourname.py c, 1000, 2

Note that, c and d use the same function with different elements count
Example2: python quicksort_yourname.py a, 1000, 2

Note: You can always keep the seed equal to 2

3- Please have your name top of your all programs.
4- You should follow general software development rules such as proper and sufficient commenting if it is necessary and proper functions and variable names.
5- For timing of your code please fill the excel sheet given to you.
6- Do not copy any code from online resources!