**Sorting Algorithms Visualizer**

**Group Members:**

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**Project Description:**

Our sorting algorithms visualizer project will utilize the implementation of sorting algorithms, in which the user will provide the desired list, which is to be sorted, while also selecting the desired sorting algorithm that is to be visualized for the user. The program will then provide a visual representation of how the list is being sorted step by step by selecting each element of the list simultaneously, and depending on the sorting algorithm, it will provide the visualization of the sorting of the list.

* Our program will take a list from the user as an input containing integers and float values. One thing to be noted is that our program will only run on a list of limited maximum length that would be around 30 elements, else it will generate an error. The reason behind this is to avoid congestion when the sorting of the data is being visualized by the program.
* The sorting algorithms that would be included in our program will include; Merge Sort, Quick Sort, Insertion sort, Selection Sort, and Bubble Sort.
* Our program will also have an option to control the speed at which the visualization of data is performed, and the user will have the liberty to select the desired speed.
* Once the user selects the sorting algorithms they want to use to visualize the sorting of the given list, the code of that specific sorting algorithm will also appear on the screen along with the visualization so that the user may get an idea of what python code has been used behind the implementation of that sorting algorithm.
* Once the user runs the program a new separate window will appear where this visualization will be performed. This separate window will appear since we will make use of python’s built in GUI function; **tkinter**.

**Project Outcome:**

The aim of our project is to provide a broad and comprehensible view of how a sorting algorithms works in python at the back-end making it easier for the user to understand the concepts, and function of sorting algorithms and making it easy for the user to visualize them. This project will also be beneficial for us throughout our current DSA course and future Data structures related courses in order to better understanding various sorting algorithms.

**Data Structures/Algorithms/Libraries to be utilised:**

* Lists
* Tkinter for GUI implementation of the program:

1. From tkinter import \*
2. From tkinter import ttk.

* Sorting Algorithms:

1. Merge Sort
2. Quick Sort
3. Insertion Sort
4. Selection Sort
5. Bubble Sort

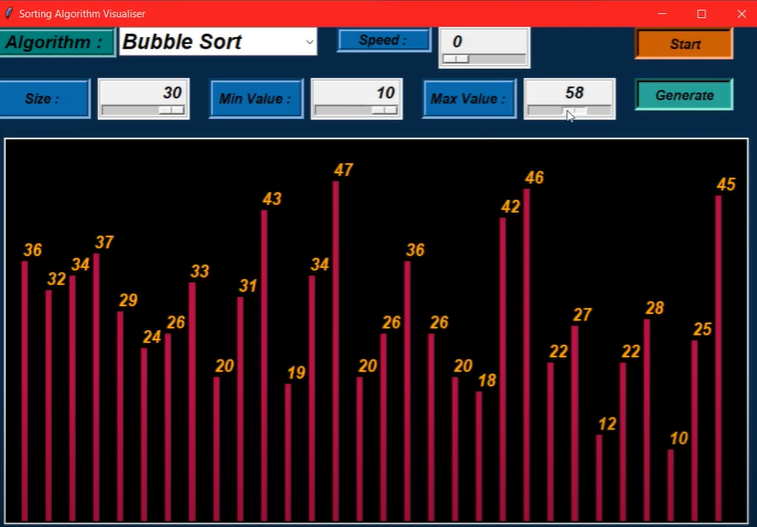
* User defined Functions.

**REFERENCE:**

<https://visualgo.net/en/sorting>

Note: The above link only provides a very brief idea of what we are intending to create, and not what our actual output will look like.

**SAMPLE OUTPUT SCREEN:**

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