

Sorting Algorithms with UI and Step by Step Visualization with Complexities Calculated Report

By: 20K-0297 and 20K-0318 of CS-5A

Abstract:

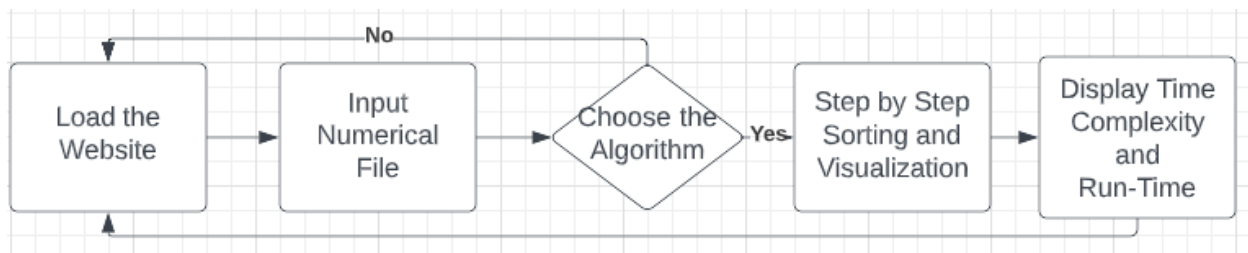
The objective of this software is to provide step by step visualization of sorting algorithms taught in the Design and Analysis of Algorithms course.

Introduction:

When website is loaded a screen is displayed where a file with numerical data has to be uploaded and a sorting algorithm from the choice of Bubble, Insertion, Quick, Heap, Bucket, Radix, Merge, Counting and two other sorting algorithms from the Introduction to Algorithms by Rivest book has to be selected. The program sorts the data and displays its step by step visualization with two colors and run-time complexity.

Programming Design:

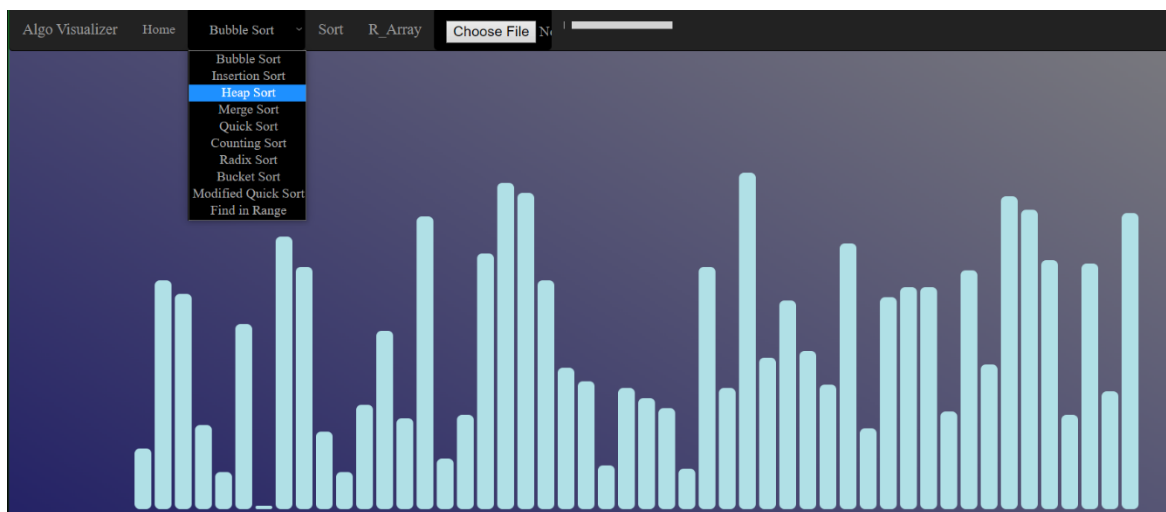
The programming languages used for running the program on the web are HTML, CSS and JavaScript. All three are used for client-side (front-end) while JavaScript is used for server-side (back-end).

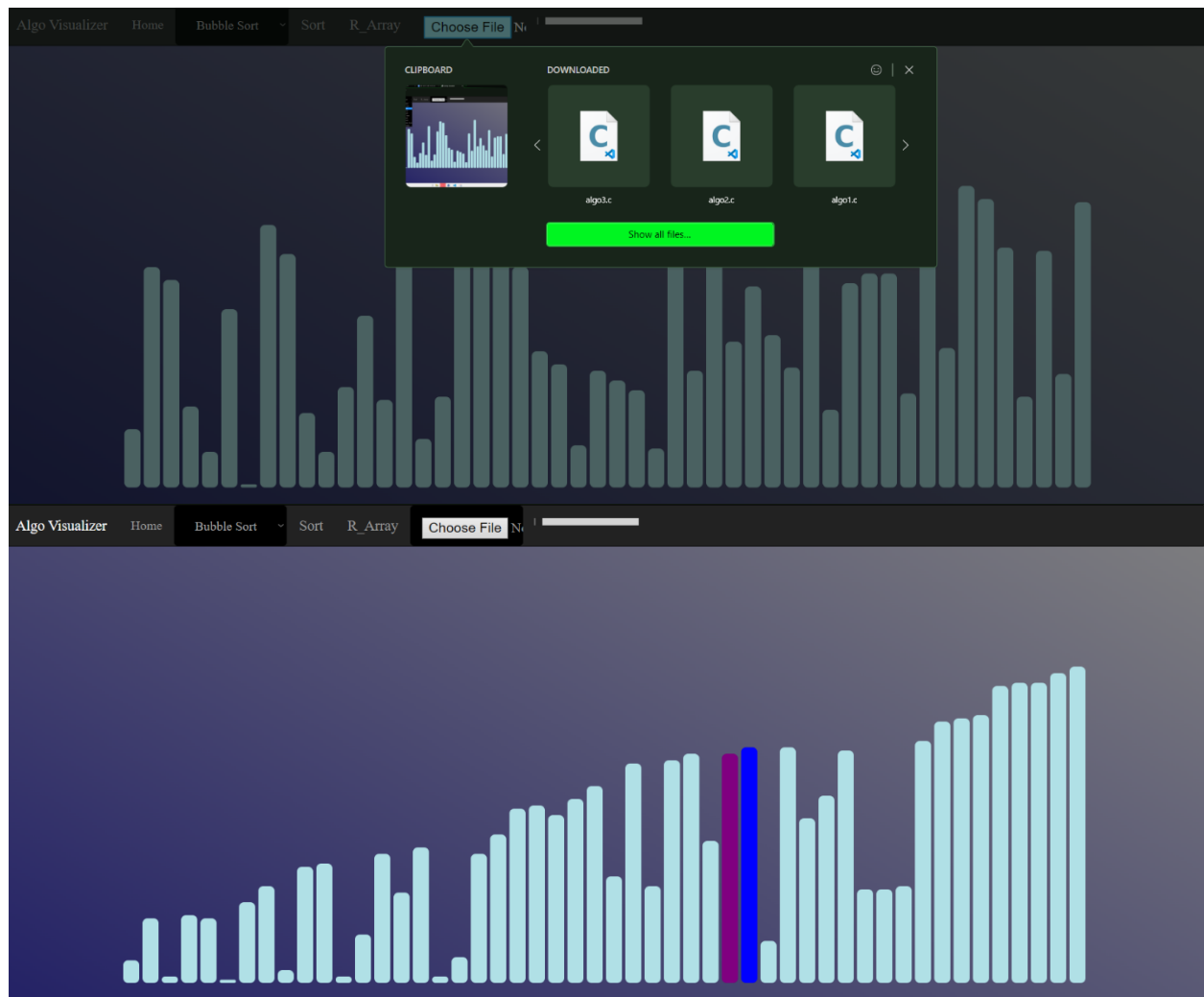


Experimental Setup:

The project requires an integrated development environment and a live server to run, for example Visual Studio Code with the Live Server Extension, for the version.

Results and Discussion:





Conclusion:

This software deepens the understanding of algorithms taught in the course through step by step visualization that is usually not perceived by mind by reading the code. The software also serves as a minimalist model of creating flexible step by step visualization software for advanced algorithms. This also serves as good starting point for those who want to learn machine learning software engineering.

References:

Wikipedia for Algorithms and Documentation for JavaScript.