MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

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CPP Synopsis on

Sorting Visualizer

Submitted by

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Sorting Visualizer

❖ **Abstract:** This paper discusses a study performed on animating sorting algorithms as a learning aid for classroom instruction. A web-based animation tool was created to visualize some common sorting algorithms like Selection Sort, Bubble Sort, Insertion Sort, and Merge Sort, etc. The animation tool would represent data as a bar-graph and after selecting a data-ordering and algorithm, the user can run an automated animation or step through it at their own pace. The study consisted of a demonstration and survey that asked the students questions that may show improvement when understanding algorithms. The results and responses are recorded and analyzed in this paper with respect to previous studies. At the end of this module you will have a platform where anyone can visualize how sorting algorithms works and you also can showcase your HTML, CSS, Bootstrap, JavaScript Skills.

❖ **Aim**: This project sorting visualizer is a very simple UI and it allows the users to select the sort algorithm, select the array size, and speed of the visualization.

❖ **Scope:** Sorting Visualizer is a web app for visualizing a bunch of different sorting algorithms Like Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Heap Sort With the functionality of (Speed Control) and (Array Size Control).

❖ Software Requirement:

Sr. No	Resource	Quantity
1	VS Code (Editor)	1
2	Brower (e. g. Chrome, Mozilla Firefox, etc)	1
3	Important Plugins	1

❖ Hardware Requirement:

Sr. No	Resource	Specification	Quantity
1	Computer or Laptop	1, I3 or above processor 2. 4 GB or above Ram	1

❖ Existing System:

1. We cannot provide custom array in existing system.
2. In some existing web applications, animation is not understandable to coder community people.
3. Conceptual functionality of the sorting visualization is not clear.

❖ Proposed System:

1. Improvement in animation and custom array.
2. Theoretical background along with logic of sorting algorithm's is injected.

❖ Methodology:

1. Creating the website's User Interface (UI) using HTML, CSS and enhancing it further using Bootstrap; without actually implementing any of the app's core features.

2. Implementation of animations, effects using HTML5, CSS3 and JavaScript (ES7) of sorting algorithms.

3.Implemetation of core functionalities of sorting algorithms using JavaScript.

❖ Testing Methodology:

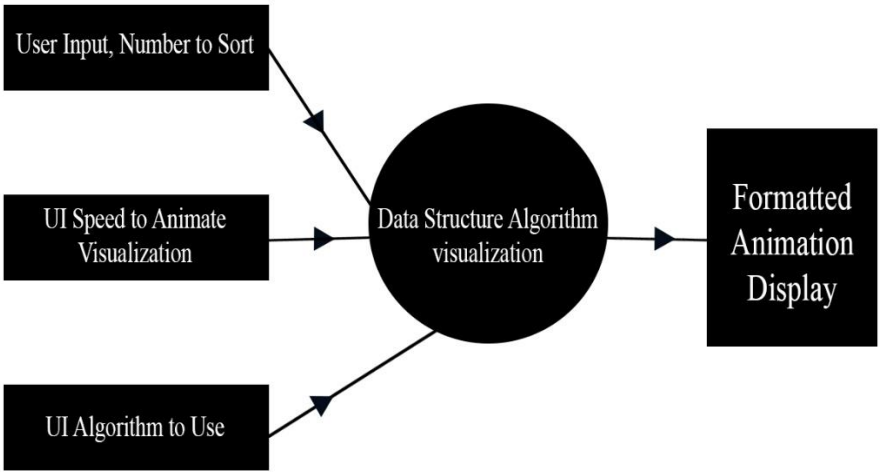
Unit Testing: Unit testing is the first level of testing and it is the process of ensuring individual components of a piece of software at the code level are functional and work as they were designed to.

Integration Testing: After each unit is thoroughly tested, it is integrated with other units to create modules or components that are designed to perform specific tasks or activities. These are then tested as group through integration testing to ensure whole segments of an application behave as expected.

Usability Testing: Usability testing is a testing method that measures an application's ease-of-use from the end-user perspective and is often performed during the system or acceptance testing stages.

Compatibility Testing: Compatibility testing is used to gauge how an application or piece of software will work in different environments. It is used to check that your product is compatible with multiple operating systems, platforms, browsers, or resolution configurations.

❖ **Data Flow Diagram:**



❖ **Application**: Algorithm analysis and design is a great challenge for both computer science and information technology students. From earlier classes itself, we were studying about the data structures and algorithms. Some of us are just by hearting the code.ie, we don't know how the working is going on there. And also, we didn't get an idea about these things i.e., functionality of code both logically and conceptually. So, we are going to implement visualizer web site to understand sorting algorithms more effectively and easily for non-coder community students also.