Simulation of Sorting Algorithms

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Abstract- Many students find Sorting Algorithms difficult because it requires abstract thinking. So, to ease up the hardships of students this idea of the project was formed. Our website Sim- ulation of Sorting Algorithms is both interactive and attractive to students. It is a web-based animation tool to visualise common sorting algorithms like Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort. It gives the students hands on experience of the algorithms' implementation. It feeds into their imagination to help them get a better understanding while also helping teachers to help make their students understandbetter. Through this project every student can learn at their own pace with their own speed. This interface is designed to make one feel fully engaged and concentrated. We have made use of HTML, CSS and JavaScript language for our project. The aimof this project is to make learning less of a burden and more ofan incredible experience which leaves students with the want to learn more.

I. INTRODUCTION

When we talk about complex subject topics like Algorithms, it becomes extremely necessary for students to have a strong grip over the topic as it would form the foundation of their computational thinking and programming skills. We had observed that through conventional methods of teaching, it becomes a little difficult for students to understand the concept and also for teachers to explain their thoughts.

a): So, we developed a method of learning through visualization and hand-on experience over different sorting algorithms which is bound to help the students and teachers. Good visualizations bring algorithms to life by graphically representing their various states and animating the transitions between those states. Visualization allows the human visual system to extend human intellect; we can use it to better understand these important conceptual processes, other things,too.

II. OBJECTIVES

To make learning of sorting algorithms and data structure much more easily. To develop a user friendly environment. To provide animation speed control for the user.

III. EASE OF USE

This website provides the college students or learner to vi- sualize sorting of arrays using different sorting algorithms. This web app extremely user friendly. It is very easy to use for any age.
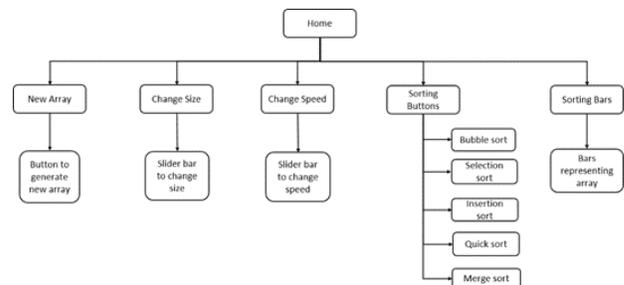
IV. FIGURES

Fig. 1. Block diagram for Simulation of Sorting Algorithms

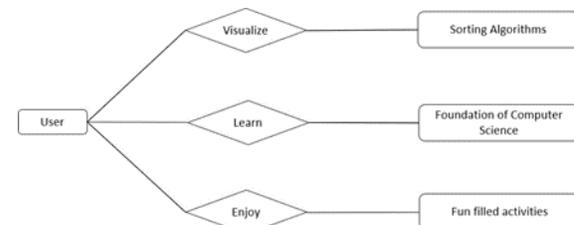This diagram shows the working of the project, like principal parts and functions.

Fig. 2. ER model for Simulation of Sorting Algorithms
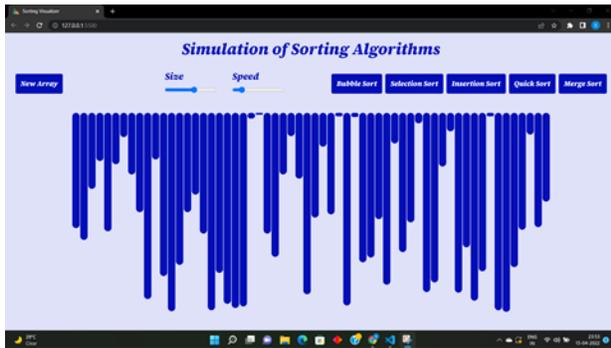
V.   RESULT

Fig. 3. New Array Generation

This 'New Array' button generates a new random arrayevery time.

Fig. 4. Change in Size of array

This slider of 'Size', changes the number of bars on screen.
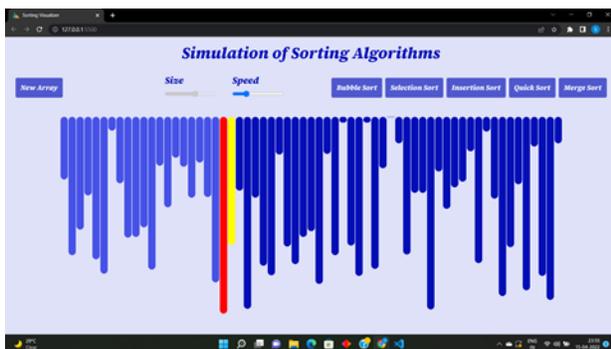

Fig. 5. Comparing two bars with different colours

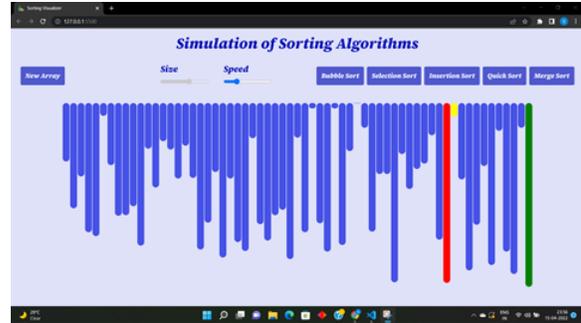This is a comparison of array elements using different colours.

Fig. 6. Sorted bar in green colour

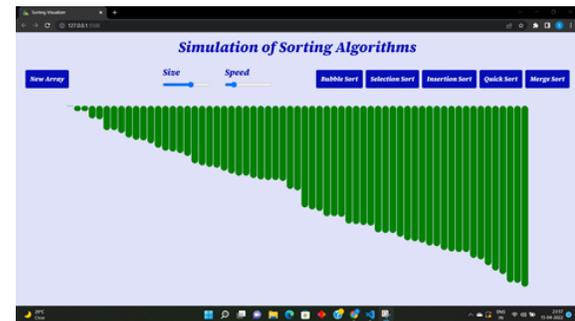This is a sorted array element in green colour.

Fig. 7. sorted array

This is a fully sorted array.

CONCLUSION

When we ourselves were learning the subject of algorithms in our curriculum, we found it a bit difficult to relate and understand the practical implementation of the algorithms owing to the difficulty in communication of the concepts fromthe teachers to the students. We found that there were noproper means that the teacher should adopt to portray their ideas in a better and easy manner in front of the students.So, we built an application which could help in the following ways: -

- It has been found that it becomes easier for humans to retain the concepts when learnt through visuals than just textual or speech explanations.
- Application is extremely user friendly so people of any age can engage and start learning new things right away.

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