ENHANCED APP BASED SORTING ALGORITHM VISUALIZER

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Abstraction: Computer Science is a field of not just generating solutions to day-to-day activities but also to enhance is to the fullest. Algorithms are the basic practical unit for improving any activity that offer work with specific productivity, and to obtain increase the productivity of a task. Sorting is the key component of Data structures and Algorithms. However, it is complicated and we couldn't able to recognize the whole algorithm and code for the first time. So the use of this application has many superior understanding on education. The key element of this project is to help beginners to be able to visualize the sorting algorithms so our brain can understand faster and remember better. And also get better understanding of underlying operations.

Keywords: Visualizer, Data Structure, Algorithm, Sorting

I.INTRODUCTION

Computer Science is a field entirely builds of building more efficient tools and logics. Software is a set of programs which were written with logics. These programs and logics are written with defined measures and used various techniques to achieve final output which is highly efficient are known as algorithms. Algorithm means set of rules to be followed in calculations and problem-solving operations. Algorithms must be highly optimized to achieve the better time and space complexity. Hence, we implement this project to obtain understandability of various sorting algorithm and searching.. We have learnt various sorting algorithm. However, often we fail to understand the core idea of particular sorting however may be we unable to visualize the working of it. So the most important thing to understand about the working of algorithms is "Visualization". By this application students freely obtain deep understanding of various sorting and searching algorithm by getting the data and algorithm related to particular sorting and searching of their choice. Users will obtain effective, efficient and theoretical knowledge of data structure and algorithms.

II.AIM AND OBJECTIVE

Aim
❖ To make a clear understandability of various sorting algorithms using an application this will simulates the sorting like bubble ,quick ,merge ,selection any other algorithm.
Objective
❖ To study how the values are compared in a sorting algorithm and swapped.
❖ Total Number of comparison and exchanges performed in a sorting algorithm.

III.LITERATURE REVIEW

In the existing system of Sorting Algorithm Visualizer, array comparison is existing and step explanation is done in written form. We can learn how to swap the array of any of the sorting and searching only through array comparison method. Visualization is not available in the existing system if we desire to know sorting or searching through visualization we have to access different websites to see visualization of sorting as well as searching. Logic of various sorting and searching is also not accessible and everything available in different sources thus for accessing things related to sorting and searching we have to search different websites and it is tedious. Students can able to understand the algorithm of their choice however unable to save the understood data of chosen algorithm in their own words by writing or speaking. Searching is not accessible previously. We can't specify the size for particular

array. Previously some sorting algorithms are unlocked and some sorting algorithms are lock for performing the lock sorting we have to buy the sorting.

PROPOSED SYSTEM

App based sorting algorithm visualizer is an application in which we have shown the information (like Definition, Algorithm, Program) of sorting as well as searching technics. There is a search bar in the application to search the technic which one want to learn instead of scrolling down to search the technic and also we have added the feature of voice note to save the notes in own language instead of using pen and paper to note the thing . The most interesting part of this application is the user can see the sorting/searching of the array in the visual form which means we are presenting the visualization of the sorting and searching technics (like how the technics works) and there is an option of generate new array through which user can generate their own array (if they wants to) to perform the sorting and see visualization on their own generated array.

IV.IMPLEMENTATION

The HTML5 (Hypertext markup language), PHP (Hypertext preprocessor), JS(JavaScript) libraries and CSS (Cascading Style Sheets) is used for building the project. Code contain in one Html file i.e. preprocessed by PHP language. We have used Speech Recognition library of js(Speech Recognition) for storing data/note in the form of audio i.e. by speaking. However, we modified, user not only store information in speech-to-text form but also user can store information in written form. For visualization we have used Standard Recognition library. We have used four object:
Represent information and algorithm related to sorting as well as searching.
❖ Visualization.
❖ We can size the array according to our choice.
❖ How much time is required to sort the particular array we able to know that also (time required).
We have used waterfall methodology to work more efficiently through all the phases of our project. We have merge both the modules i.e. visualization and all algorithms. In this we integrated both and created the final result by generating array automatically of particular sorting and then press on the sorting button, start to sort numbers one by one and also we have built time requirement module to understand how much time is required to sort the particular array.

V.RESULT

App based sorting Algorithm Visualizer, is the app based application to access the user need to login to application for which user need to register first.
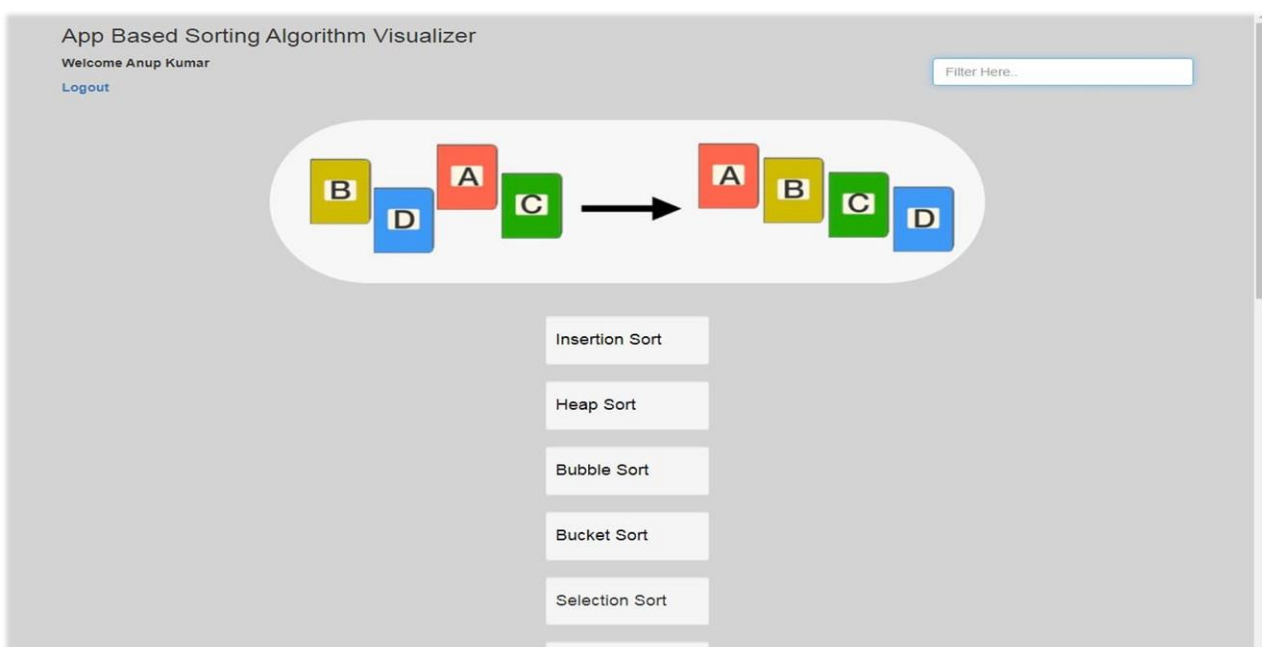After login successfully home page as shown the fig below

Fig:1 Home page of sorting Algorithm Visualizer

In home page at the left-hand side there is a search box (as shown in fig) through which the user can search the searching or sorting technique which the user wants to see or learn.

After select particular sorting or searching technique user visit information page of their selected technique (there is the information like definition, algorithm, program or code is available for the user)

After visiting information page user need to click go to algorithm and user reach the visualization module, there is the option to generate a new array or to see visualization or sorting on the existing one (as shown in the fig below)
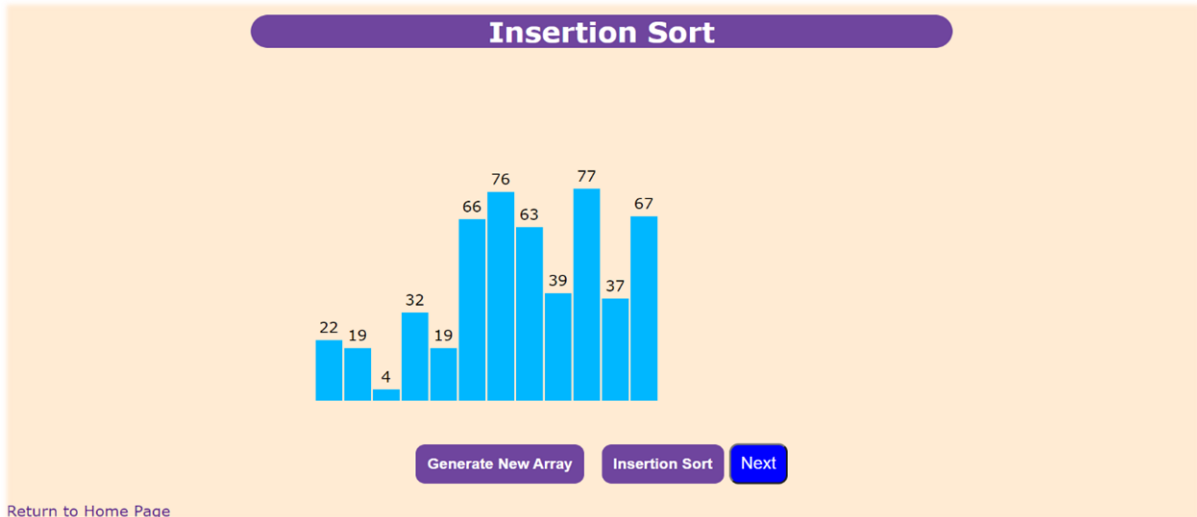

Fig:2 Visualization module

Then click on the sort button, the sorting of array get started and the user can see the entire process of the sorting/searching of the particular technique (which the user chooses) in the visual form hence we had given the name to this application as Visualizer.

After completion of the process (sorting the unsorted array) the time complexity or the amount of the time required by particular technique to complete the process (sort the array) is displayed with the sorted array.
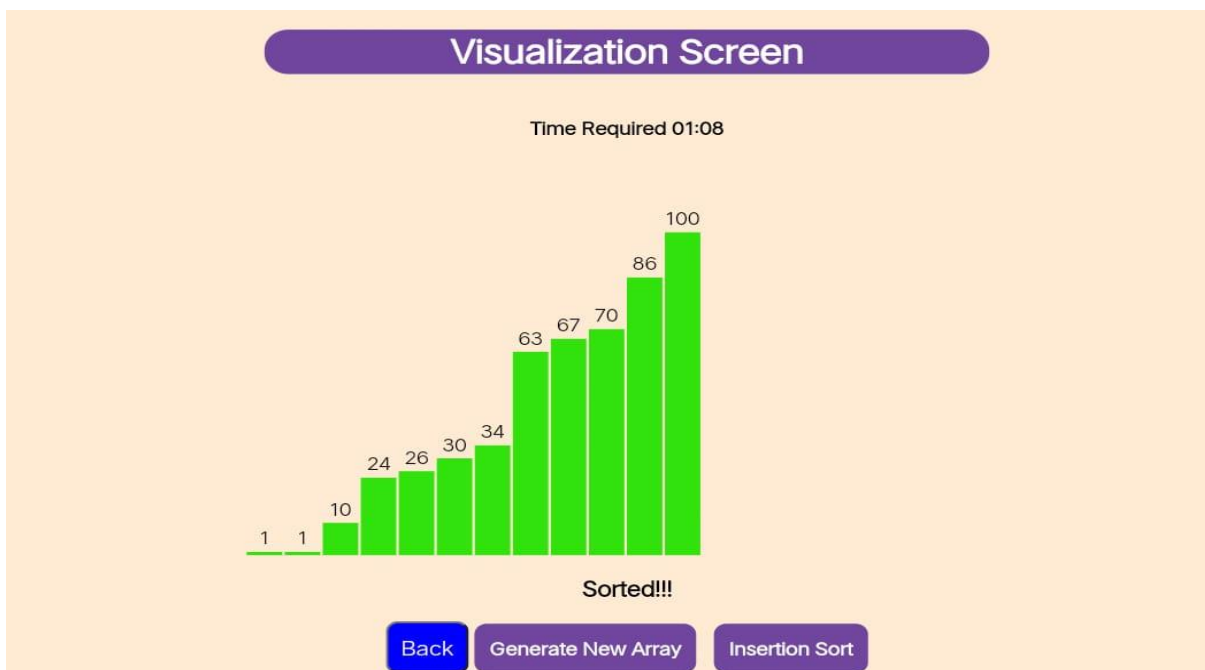

Fig:4 Sorted array with time complexity

VI. CONCLUSION

The project titled "App based sorting algorithm visualizer", has been completed. The system has been designed with great care and error-free, while still being effective and time-saving.

This platform as well as practical experiences with system we believe it helps to improve the education quality in the stream and contribute to the solution for some of the problems in higher education.

However, strong mindset help us to research and generate animation to improve learning in the classroom. Hence, from this project we can easily understand the working of sorting and searching through their geometric graphical visualization or representation and their explanation. It is easy to know all sort and search and also effectively beneficial and efficient.

Our intentions here include development of new plug-in modules from the area of sorting algorithms and more complex data structure. In present the data which we have store in database in the form of audio and written in future we will see the stored data on the side of information page. Need to give more thought on how to optimize the code so that it can work with multiple people using it. User can split the screen in which half of the screen will show the visualization of sorting and other half will show the code of particular sorting and as well as searching.

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