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REVIEW ON SORTING TECHNIQUES VISUALIZER

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ABSTRACT

The purpose behind this project is to study how to perform different operations of sorting algorithm of data structure so student can easily learn various types of algorithm through an graphical view it will make a data structure learning more interesting. Data Structure design and analysis of the algorithm is big challenge for both computer and Science Students. Implementation of this project to make clear understanding of various algorithm of data structure such as an Bubble sort, Insertion sort, Selection Sort and so on .The various tools is used for the study are case analysis of sorting algorithm such as best case average case.

Keywords *- Analysis of Sorting Algorithm, Selection Sorting Algorithm Visualization, Sorting Visualizer, Visualization of Sorting Technique, Visualizing Sorting Algorithm.*

I. INTRODUCTION

Data structure and algorithms (DSA) is important field of Computer Science and Engineering. Data structure related concepts are complicated to understand for learners so this project performs visualization of algorithms. It helpful for students to understand that how actually sorting methods work. Methods are like Bubble sort, Selection sort, Insertion sort, Merge sort and so on. In visualization data can be represented by Bar graph. Animation tool shows sorted data and unsorted data with different colors. Colors change after sorting techniques. This platform helps to improve theoretical concept regarding Data structure and algorithm.

LITERATURE SURVEY

Sr. No.	Paper	Year	Author	Review

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1.	A system for algorithms' animation	1999	D. Merlini, S. Petruzzi, R. Sprugnoli and M. C. Verri	Data structure related complicated concepts are difficult to understand for student. So, visualization technique helps teacher to teach them very easily Sorting algorithm show user input data through animation. This tool shows sorted data and unsorted data with different color. It helps student to understand, how data can be sorted dynamically.
2.	AVE: A Dynamic Algorithm Visualization Environment for Novice Learners	2008	E. Vrachnos and A. Jimoyiannis	Sorting algorithm represent sorted array through animation. This tool shows sorted data and unsorted data with different color. It helps student to see how sorting function actually work to sort data at backend
3.	Sorting Algorithm visualizer	2022	Thakkar, Kavita, S. Dashand S. K. Joshi	It is E-learning platform which helps to improve theoretical concept regarding Data structureand algorithm. Data can be represented by Bar graph, and then sorting algorithmmay be apply on that.In Sorting Visualizer, take input data from user and show that data as bar graph. Then choose animation tool and after that algorithm can be apply on it.
4.	Algorithm Visualizer: features and Its working	2021	Goswami, A. Dhar, A. Gupta and A. Gupta	Some learners can't understand theory with clarity. From this work student can visualize several algorithms and learn new concepts. This visualizer is easy to operate and implement. It contains stepwise representation of visualization of algorithm which makes it easy to understand.

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5.	Creating Engaging Online Learning Material with the JSAVJavaScript Algorithm Visualization Library	2016	V. Karavirta C.A.Shaffer and	DSA is complicated to learn for most of the students. Learners can improve their DSA topics with JavaScript Algorithm Visualization. In this contain JavaScript Algorithm Visualization library. This library helps to visualize data structures algorithms. Learners can see previous step of visualization with actual current step.
6.	Visualizing Sequence Of Algorithms For Searching and Sorting	2009	Bremananth R.,Radhika V.ThenmozhiS.	Visualizing sequence of algorithm for searching and sorting in this paper. It help to understand how perform the sorting method in easy way. The main pros of algorithm visualization is acquire the knowledge through performing with set of data, technique of manage time and use of memory. It shows nine type of sorting algorithm form this one of animation system is BALSA(Brown Algorithm andanimator).
7.	Interactive visualization of high dimensional marketing data	2015	Alfa Yohannis Yulius Prabowo	Interactive visualization, it is used to associate all types of variable and also describe visualization of huge amount of data for financial organization. We use matrix visualization as a selection tool, its simple for find the data. The clients select data of selected variable and start analysis by using 5 variable. Using this we give good customer behavior knowledge.

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8.	Sorting visualization using ViSA (visualization of sorting algorithm)	2012	Tihomir Orehovački	In this paper, ViSA (Visualization of sorting algorithm) it describe a tool and different type of technique for visualization of algorithm. The ViSA is simple and self operating visualization system, it explain and compare step by step every sorting algorithm which is more useful to every educational student for analyze the sorting algorithm also for faculty member for teaching.
9.	Sort Attack: Visualization and Gamification of Sorting Algorithm Learning	2015	Alfa Yohannis, Yulius Prabowo	Sorting algorithm is perform fundamental role in the field of computer science, which are not understandable to everyone to defeat this problem it has been moving toward the game visualization. The combining algorithm gaming tool and instructional or graphical design isan minor task, so it require attentive design, because of that it developed conceptual model for learning instruction and Improve visualization learning.
10.	Comparative of Advanced Sorting Algorithms Based on Time and Memory Usage	2021	MarcellinoMarcellino, Davin William Pratama Kristien Margi	In this paper, it compare different type of advance sorting algorithm such as Quick sort, Heap sort, Merge sort, insertion sort. A algorithm compare on the bases of time and memory require to perform data sorting. Applications write using VS code and satisfy using python language. In this it show introspective sort good at

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				time and heap sort is good for memory.
11.	Analysis of Algorithm Visualizer to Enhance Academic Learning	2022	G. Prabhakar, S. Gaur, L. Deshwal and P.Jain	This displays how algorithms work in graphical way. Analysis of algorithm used to improve qualityof education. It is better way for students to grasp the knowledge of data structure and algorithms. In this contain download visualizerbutton. After clicking this button we can perform it on offline in our personal computers (PCs).
12.	Visualize and Learn Sorting Algorithms in Data Structure Subjecting a Game- based Learning	2022	W. H. Lim, Y. Cai, D. Yao and Q. Cao	Game based learning is important role in sorting visualization. Teacher teach them student through experiment of game playing, to clear the concept of students very easily. Student can grasp the working of data structure and time complexity ofthat algorithm in experimental way.
13.	Algorithm Visualization Environments: Degree of interactivity as an influence on student-learning	2020	P.RozaliaOsztián, Z. Kátaiand E. Osztián	Sorting visualization is e-learning platform, to improve learning environment through visualization of sorting algorithm. It improve the additional feature of online learning such as notes, data structure related material etcthrough visualization

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14.	AlCoLab: Architecture Of Algorithm Visualization System	2008	C. Foutsitzisand S. Demetriadis	This system is related to education system. The purpose of this system is to enhance learning. This visualization increases better understanding of algorithms.
15.	A New Network Topology Visualization Algorithm	2011	Y. Guozheng, L. Yuliang and C. Huixian	In this paper contain network topology Visualization. It shows different network topology visualization algorithm. There are two policies. First layer contain network characters and second layer contain dynamic layout process.
16.	Experimental study on the five sort algorithms	2011	You Yang, Ping Yu and Yan Gan	In this there are five sorting algorithms used such bubble sort, select sort, insertion sort, merge and quick sort. Along with this time complexities summarized here. Five sort algorithms were selected to do the experiments. Because of that there were manyvariations of these algorithms, therefore the algorithms definedfirstly in the beginning section, then the performances of the algorithms given by experiments in the next section.
17.	A new modified sorting algorithm: A comparison with state of the art	2017	F. Idrizi, A. Rustemi and F.Dalipi	Here analysis and comparison between the state of sorting algorithm done, based on their analogical functionalities, as well here they give descriptions of modified algorithm and finally give conclusions about the performance.

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18.	Super Sort Sorting Algorithm	2018	Y. Gugale	The super sort sorting algorithm proposed in this paper is based onthe principle of selecting the sequence of already sorted elements in a given unsorted list. It is sequence of sorted elements in an array of random numbers soas to reduce the number of steps needed to sort.
19.	Design Patterns for Sorting Algorithms	2019	J. A. Rosiene and C. P. Rosiene	Here teaching of algorithms done by design patterns rather than only implementation here student can explore new realization.
20.	Mid–Point Sorting Algorithm: A NewWay to Sort	2022	A. Garg, V. Patel and D. Mishra	This paper presents a new sorting algorithm that takes into account the mid-point of the unsorted array and checks for its neighbors in every iteration

II. CONCLUSION

It is teaching support application which visualizes the most known sorting algorithms. User run sorting algorithm by giving custom array. We tried to create high-quality software with a user-friendly and easy-to-use interface, which could be used by lecturers, tutors, and students. Possible next improvement of the applications is extension it by other algorithms.

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