Script for SPL mid presentation

Good afternoon, everyone. I'm Habibur Rahman Mahin, and I'm excited to share my project with you, developed under the guidance of Dr. Ahmedul Kabir.

Last semester when I was learning about data structures and algorithms I found it very confusing and intimidating . It was hard for me to gather all the resources on different data structures and get visually adapted to how these data structures/algorithms actually work . And it's not only me but it's quite hard for beginners and students to learn about data structures as they are often unable to visualize how these algorithms work. Based on these necessities I worked on this project -"Data Structure Simulator" which is an interactive learning tool.

So what is it actually?

The data structure simulator a tool that proves visual and interactive learning experience for the users. This simulator aims to help users gasp the underlying concepts of fundamental data structures like arrays, stacks, queues, trees, graphs and different sorting algorithms like bubble sort, insertion sort, merge sort etc.

What are the goals of this system?

There's a saying that "Visualization is the key to understanding " So that's exactly what this project is all about. It helps data structures easier to understand to the users by visualizing how various algorithms work with the help of different simulations.

Project features:

1.Interactive interface.

2.Step-by-step process.

3.Dynamic data input.

4.Interactive manipulation.

Interactive interface lets us select any data structure or sorting algorithms that we want to simulate. We can interact through this user-friendly interface.

The DSS provides a step wise demonstration of how the algorithms work . Users can follow along with the simulation to understand the data flow and changes at each state.

Users have the option to input their data elements and see how different data structures handle different data sets and how sorting algorithm arranges them real time.

This software allows users to interact with the simulations directly . They can manipulate it however they want. They can add, remove or modify the data elements and see how their actions affect the overall structure.

Here are some code snippets of the program. We can see an interface from where we can chose any data structures to simulate. Currently The green ones are available for simulation .

Here we can see two different data structures , how they look . A user can get visually adapted to these data structures by interacting with them.

We are given outputs based on our inputs. We can do all sorts of operations that are possible to do on a data structure.

As this project is not complete yet there are much work left to do. I am yet to visualize the graphs and trees. Other data structures like queues and linked list have sub classes (circular queue, priority queue, doubly linked list , circular linked list ,other insertion and deletion operations) that are not yet implemented. And the array sortings are also to be added later on.

So this was my project .

Thank you 😊