USER GUIDE

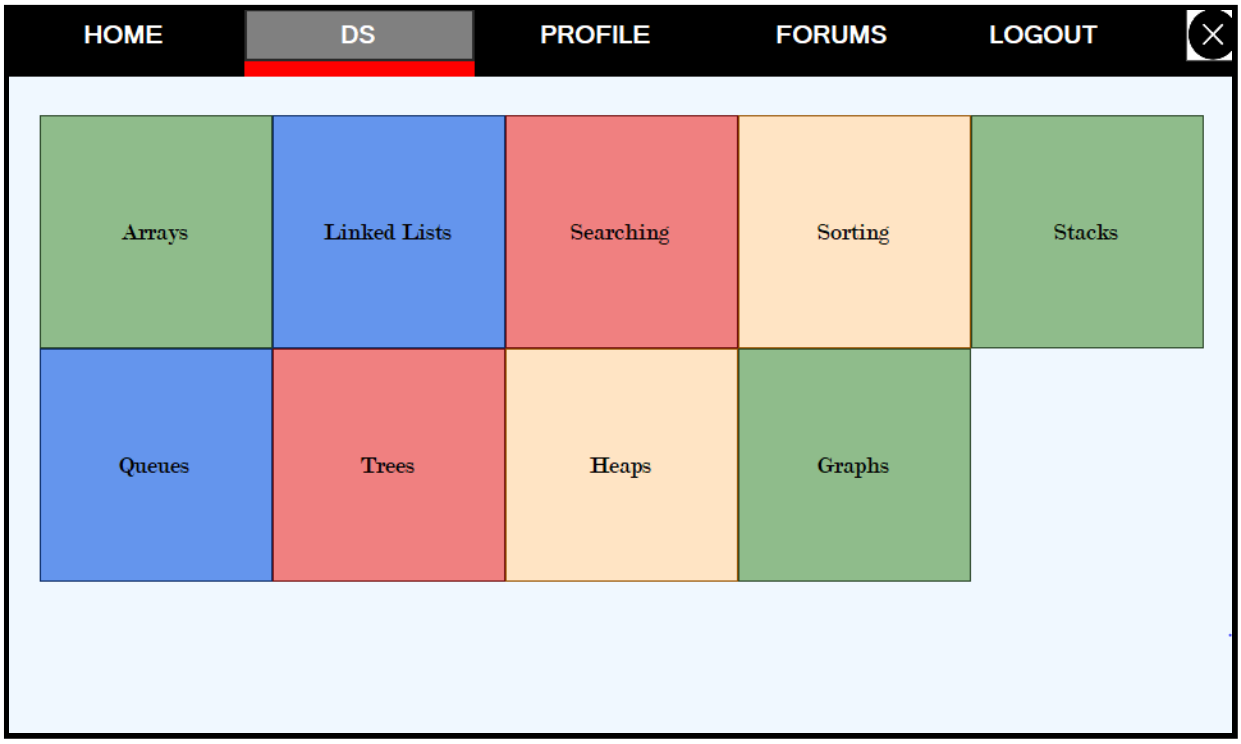
Data Structure Learning Software

Contents

1. INTRODUCTION

The software is created with an objective to aid the users to understand data structures from their basics. It includes a number of animations, visuals and question to further elevate their understanding and check on their progress.

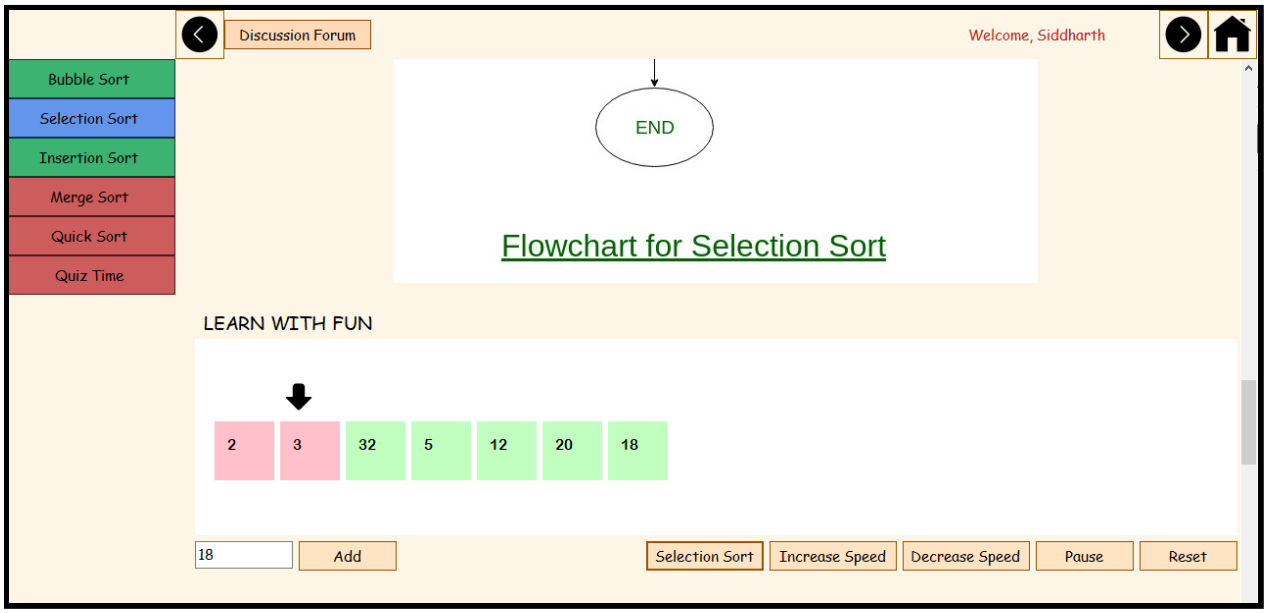
The software is built assuming that the user has a little or no knowledge regarding data structures. If that isn't the case the user can simply answer some module-wise questions and reach to the desired data structures. Searching, sorting and data structures, namely Array, Linked List, Stack, Queue, Tree, Heap, and Graph, are been covered.



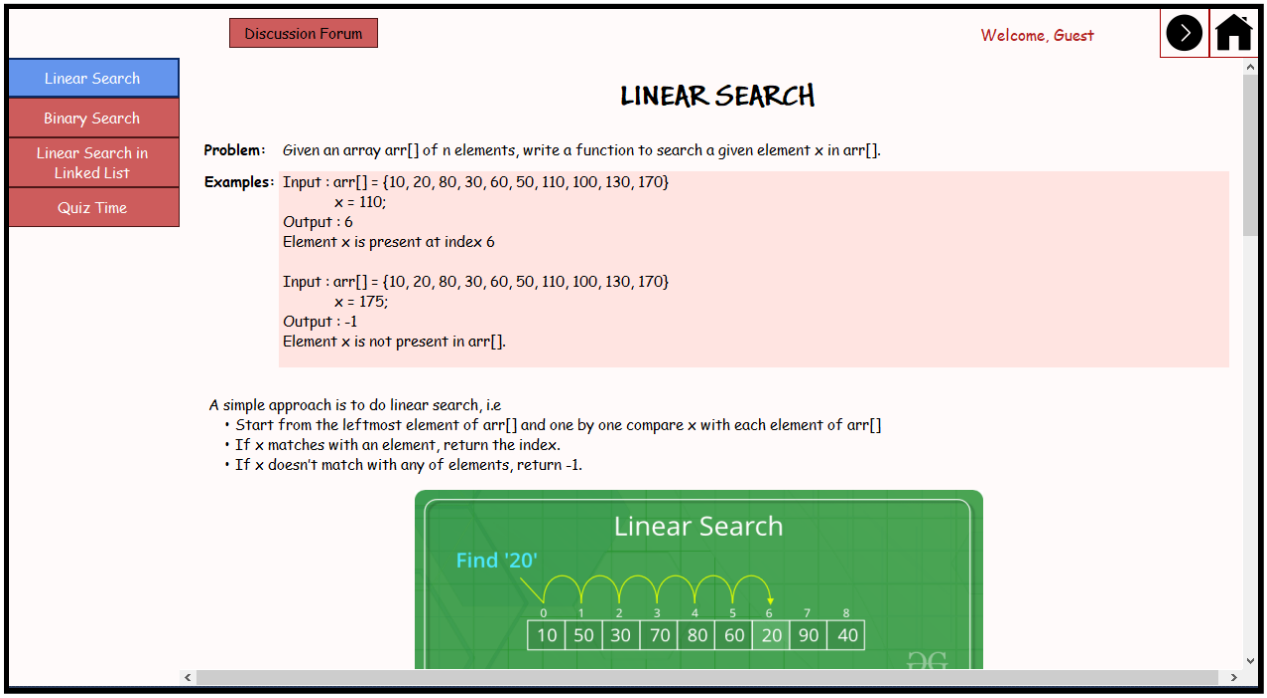
2. BASIC FEATURES

The highlighting features of this software application are:-

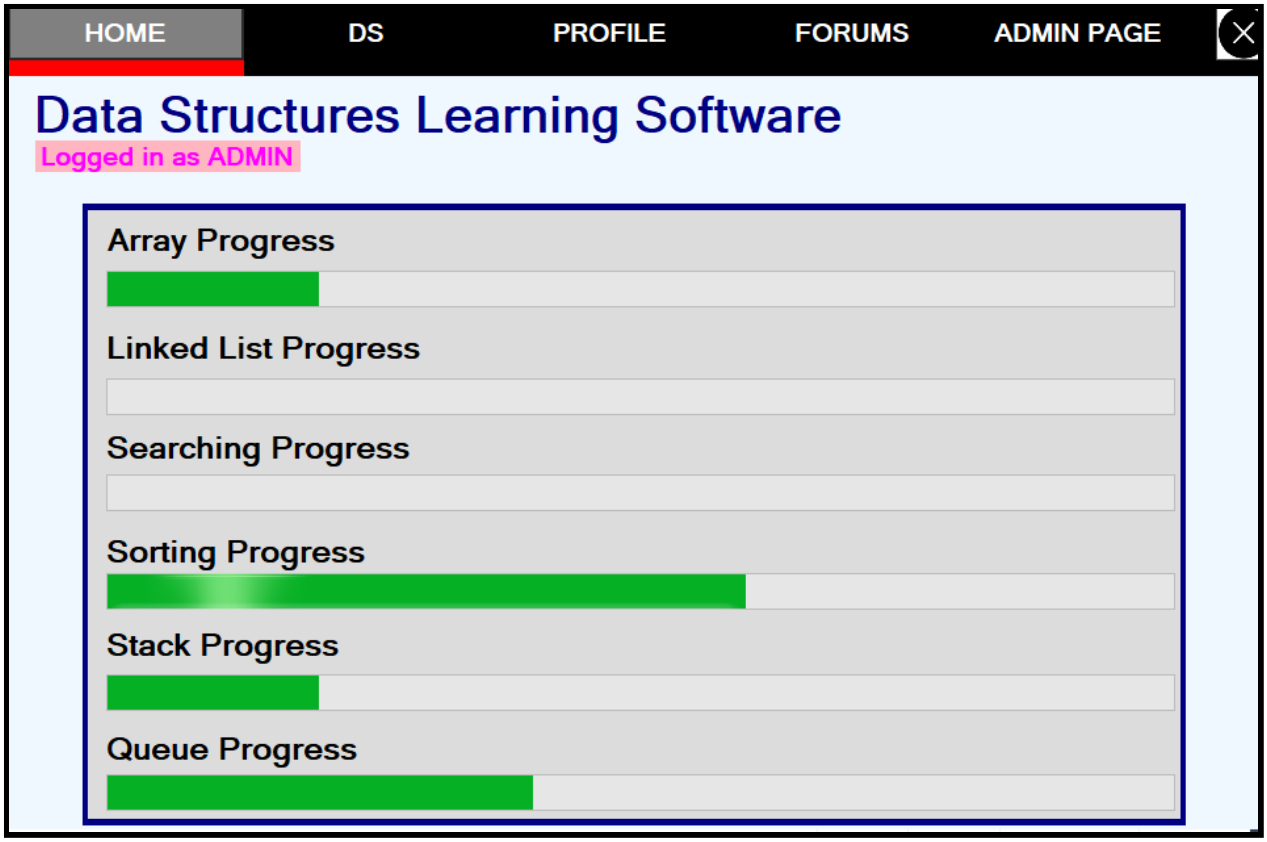
Animations for better understanding of the concepts.



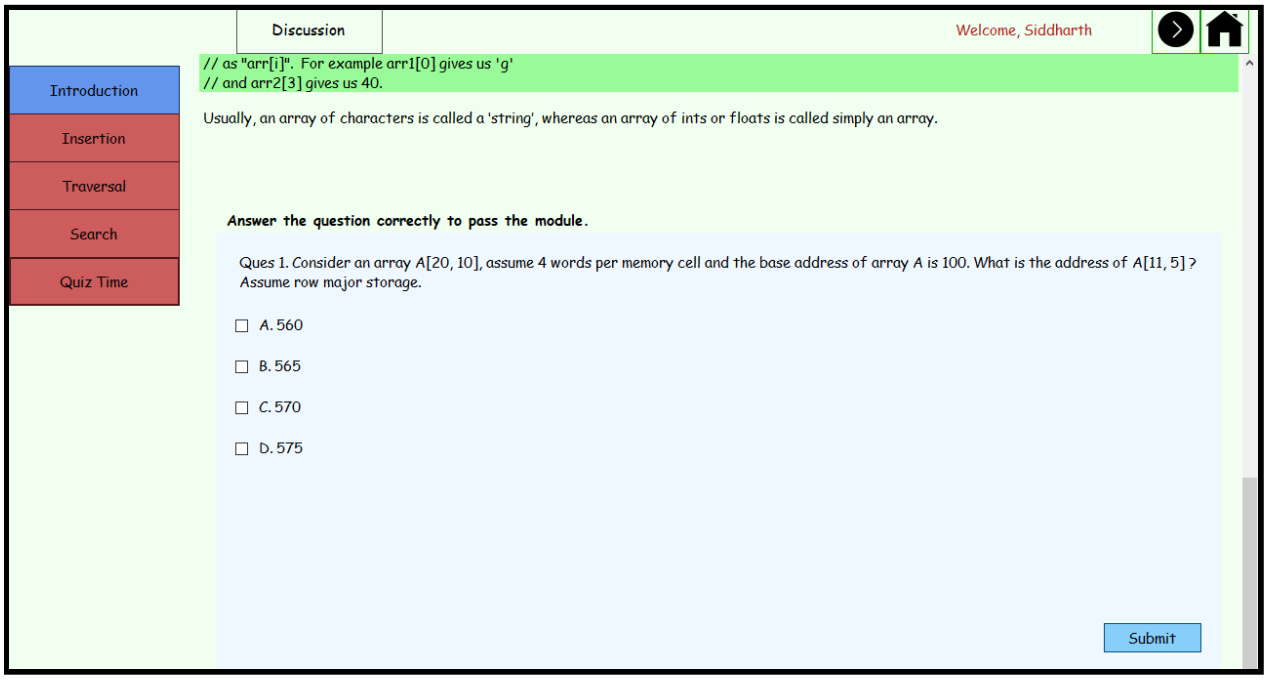
Modular division of the materials to ensure a structured learning.



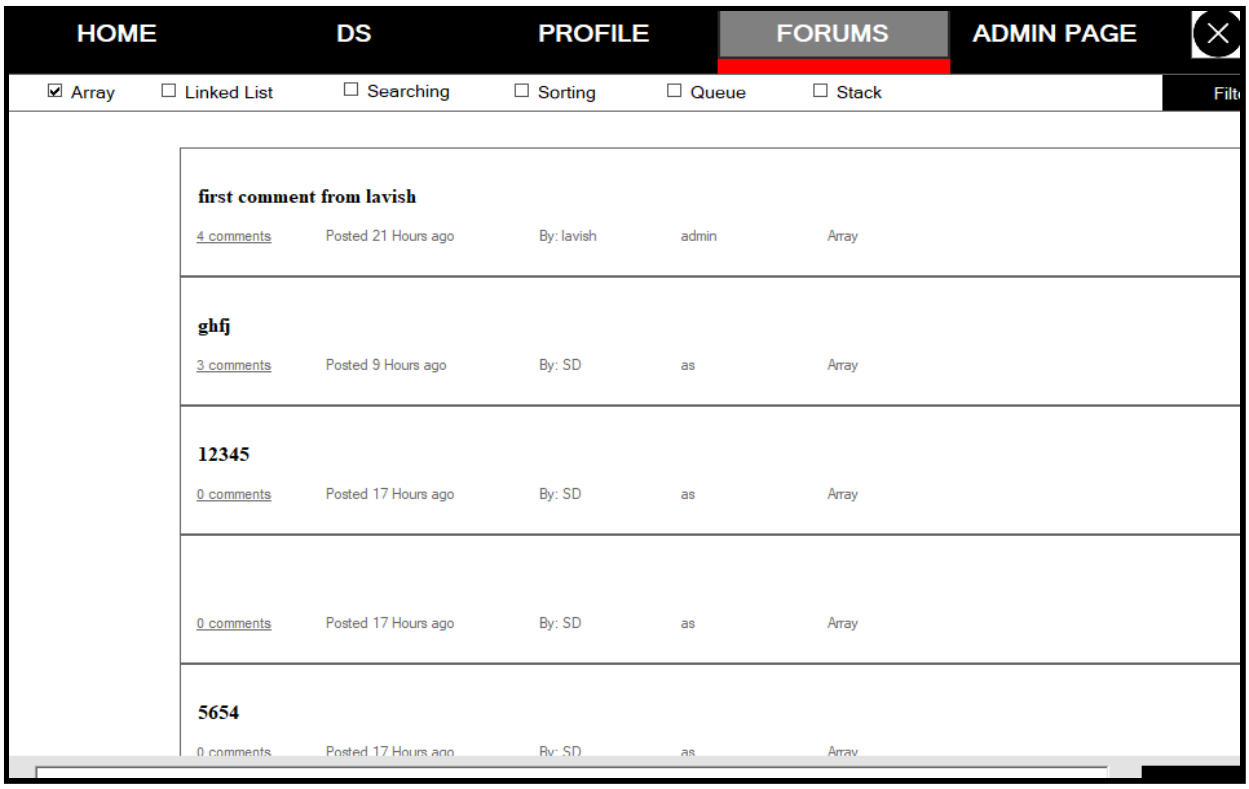
Tracking the user's progress to let them start from where they left.



A wide range of questions for users to challenge themselves with

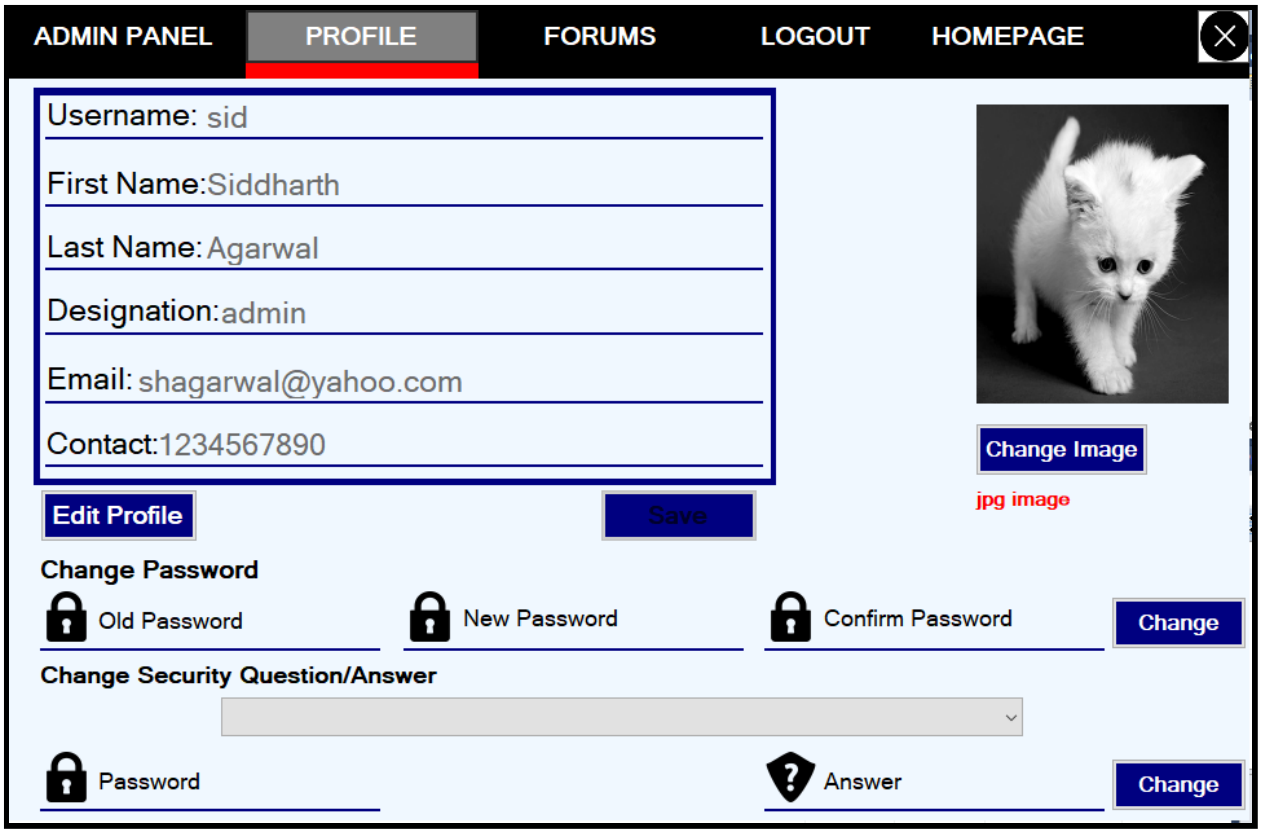


Discussion forum monitored by teachers for users' doubts.

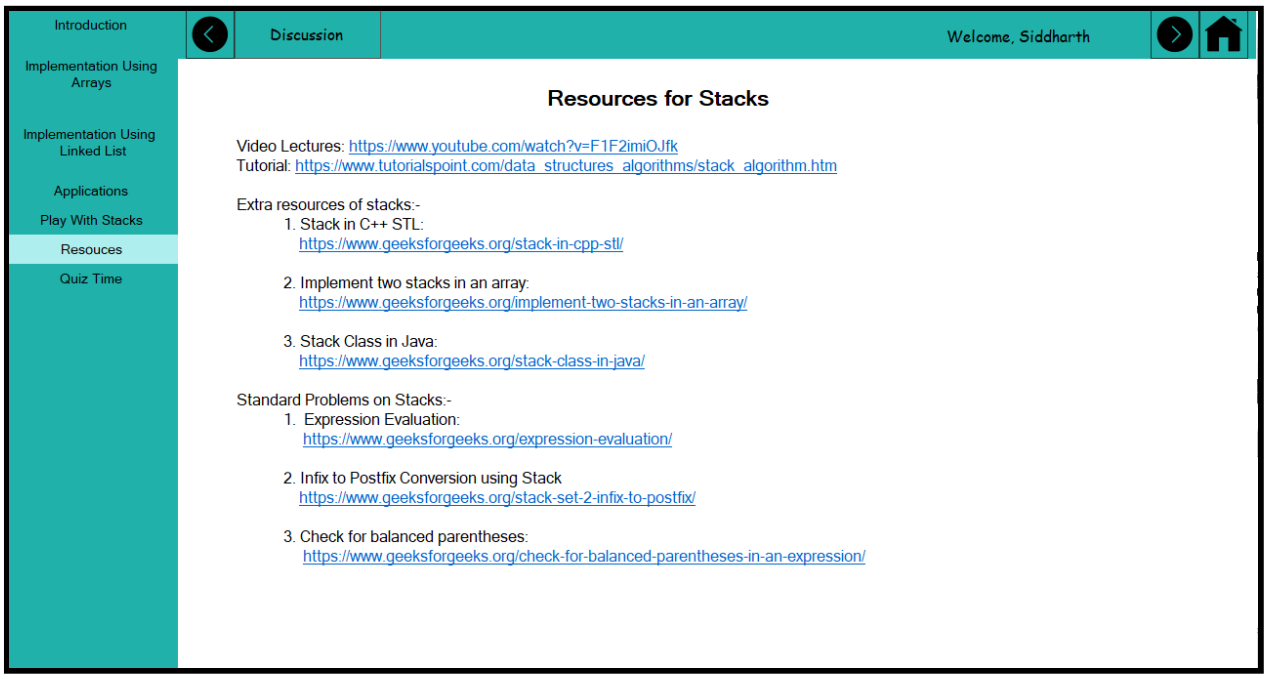


Pseudo codes and codes provided to aid the students to code.

Profile maintained of teachers and students.



Module-wise applications and resources for further information.



3. TYPES OF USERS

In this software, the user can either work as a guest user or sign-up as either a teacher or a student. The features of these three users vary slightly, as follows:-

Guest User

Guest user uses the software without signing in and as a result has none of its details stored into the software. Also, progress of the guest users is not stored and they won't be allowed to post their doubts and reply to others' messages.

Students

Students are signed-in users and hence can exercise all rights and use all facilities of the software. Unlike guest users, they are allowed to allowed to post their doubts and reply to others.

Teachers

Teachers have all the facilities of user and hence can access the learning materials to study as well. Apart from this, teacher can add questions to the already existing question bank and add, reply and remove a conversation thread as well.

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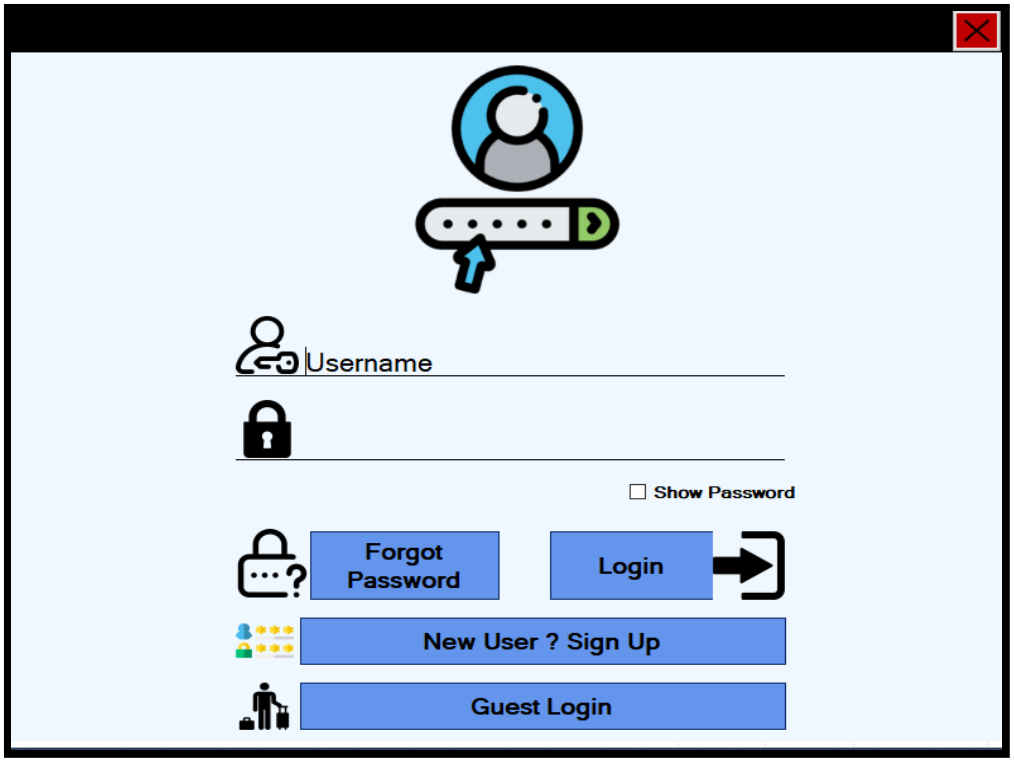
4. LOGIN AND SIGNUP

On opening the software the user has an option to login as a guest user, sign into software as an existing user or signing up.

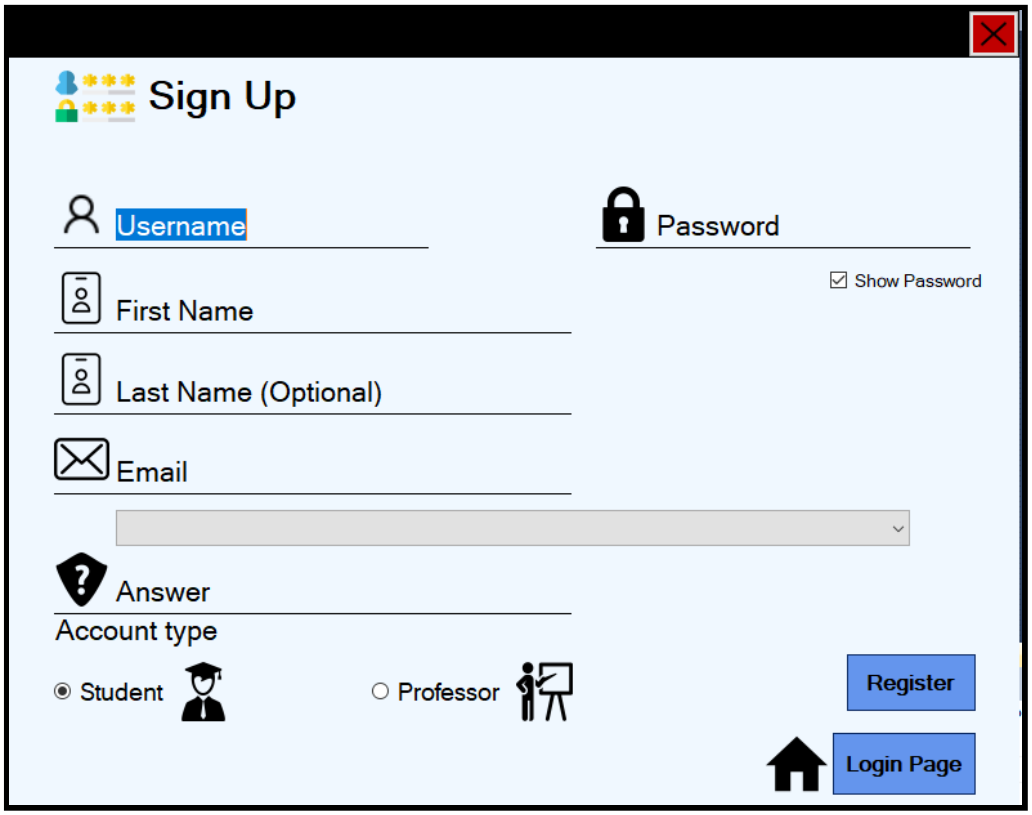
The user can enter his/her credentials to sign in, in which case he will be directed to the home page where his current progress will be shown.

If the user doesn't want to make an account permanently, he/she can login as guest to access the learning material.

Or else the user can make their new account by giving certain details.
(refer the images below)


Username
Show Password
Forgot Password
Login
New User ? Sign Up
Guest Login

SIGN UP PAGE


Sign Up
Username
Password
Show Password
First Name
Last Name (Optional)
Email
Answer
Account type
Student
Professor
Register
Login Page

5. MODULES COVERED

1. ARRAYS

One of the most basic concepts of coding, array is the first thing that is taught in this software. In this module, addition, searching and transversal of array is elaborately explained using animations. The animation allows the user to input numbers (maximum of 8) in the array and search or transverse the array.

2. LINKED LISTS

This module deals with introduction to structure and using it to create a linked list. In addition to this, addition, deletion and searching of linked list is also explained using animations. The user can insert numbers into the list and can delete it too!

3. STACKS

After the first two module, the third module deals with stacks and their implementation using the first two. Animations are added to show push and pop operations in both arrays and linked lists that are created by users' inputs..

4. QUEUES

This module is to teach queues and their implementation using both arrays and linked lists. It deals with enqueue, dequeue, front and rear operations in both linear and circular queues. Additionally, animations are added to show the working of above mentioned operations.

5. TREES

This module explains binary trees and operations on it. It deals with addition and deletion operations and explains preorder, inorder and postorder traversal in trees. Additionally, animations are added to show the working of above mentioned operations, users are allowed to give custom inputs for addition and can see the deletion process in the same.

6. HEAPS

This module is to teach heaps and their implementation using arrays. It deals with operations in min-heaps like addition, deletion, extract min etc. Additionally, animations are added to show the working of above mentioned operations.

7. GRAPHS

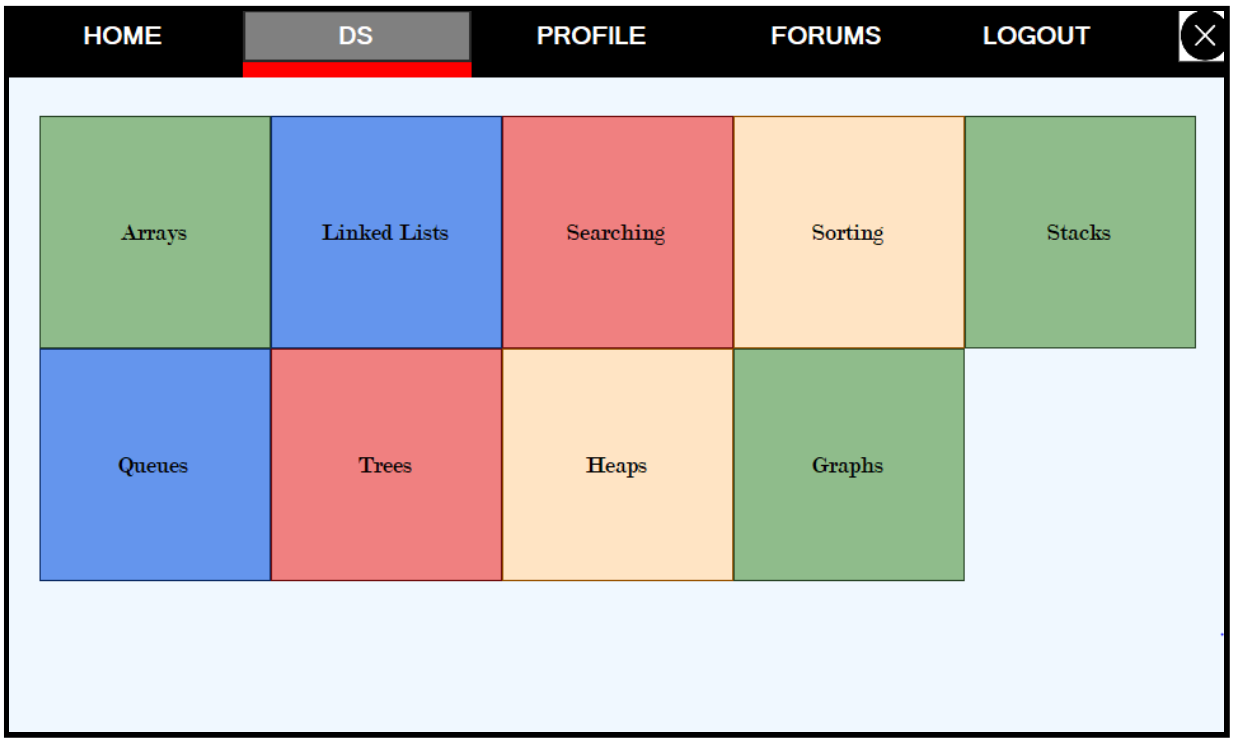
One of the most used data structures, Graphs, are discussed in this module. It explains the graphs, depth first search and breadth first search in the same. Additionally, animations are added to show the working of above mentioned operations.

8. SEARCHING

The Searching module shows the measure to search for a particular value in either linked list or array. It explains both linear and binary search and shows animations for the following to explain the methods.

9. SORTING

This module elaborates various methods of sorting in increasing order. It explains sorting in both arrays and linked lists. The various methods covered are namely, bubble sort, selection sort, merge sort, bubble sort and quicksort. Moreover, animations are added to show these different methods.

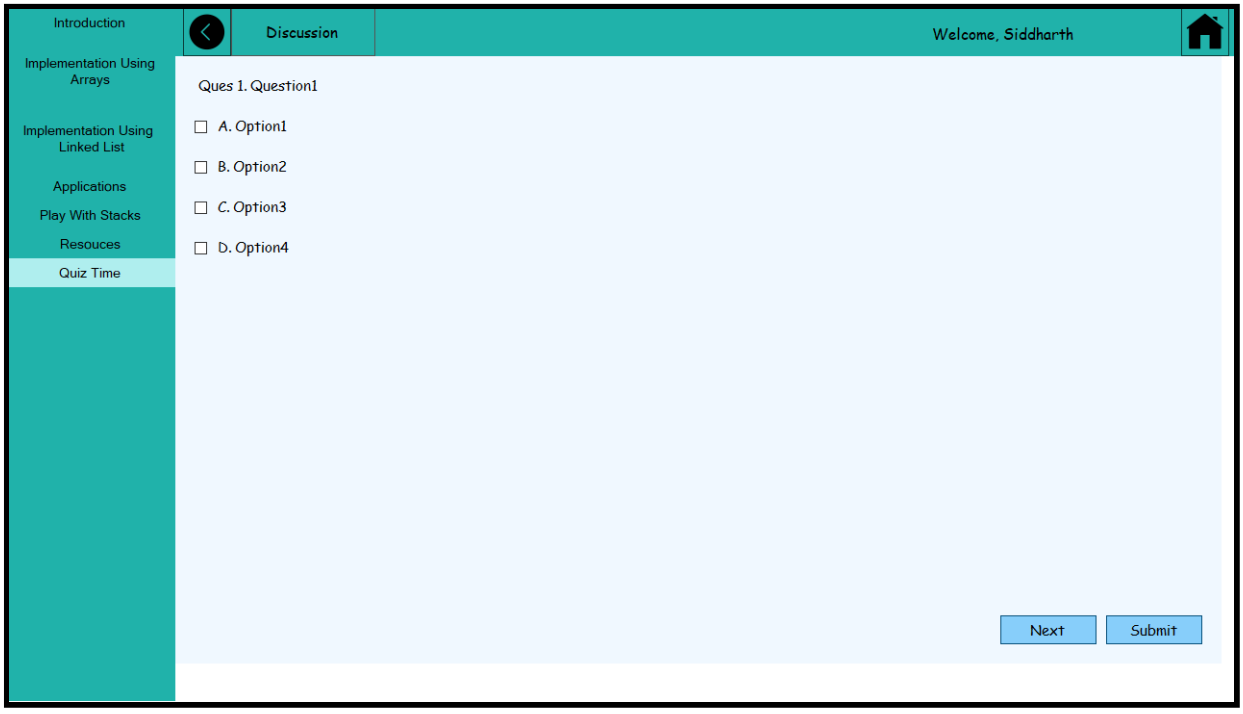


6. QUIZZES

Practice is essential for better grasping of a data structure, and hence the data structures learning software picks up random questions to apply the things user has learnt till then.

Every module has topic-wise questions which are to be solved to proceed to the next submodule. These questions are intended to check that user is thorough with the material provided.

Apart from this after completing the module, user can take a quiz to check their proficiency in the topic.



7. DISCUSSION FORUMS

The discussion forums are applied in the software to address to the doubts that the user gets during the learning.

The discussion will be sectioned according to the module it is related to, user can assign the same while posting up a message in discussion forum. User can go to discussion forum from their respective modules or from the homepage.

Apart from adding a message, both teachers and students can reply to existing messages, creating a conversation thread. Nesting of replies is not allowed.

In case of any offensive or unrelated message, there is a facility of reporting a message for the users.