North Western University, Khulna

Report

Course Code: CSE -2104

Course Title: Data structure Laboratory

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Introduction

A simple implementation of a data structure project that involves array and linkedlist operations using the Tkinter module for creating a graphical user interface(GUI).

 An array is a finite set of the same type of data items. In other words, it is a collection of homogeneous data items. The elements of an array are stored in successive memory locations.

 Linked list is a list or collection of data items that can be stored in scattered locations in computer's memory. To store in scattered locations in memory we have to make the link between one data item and another.

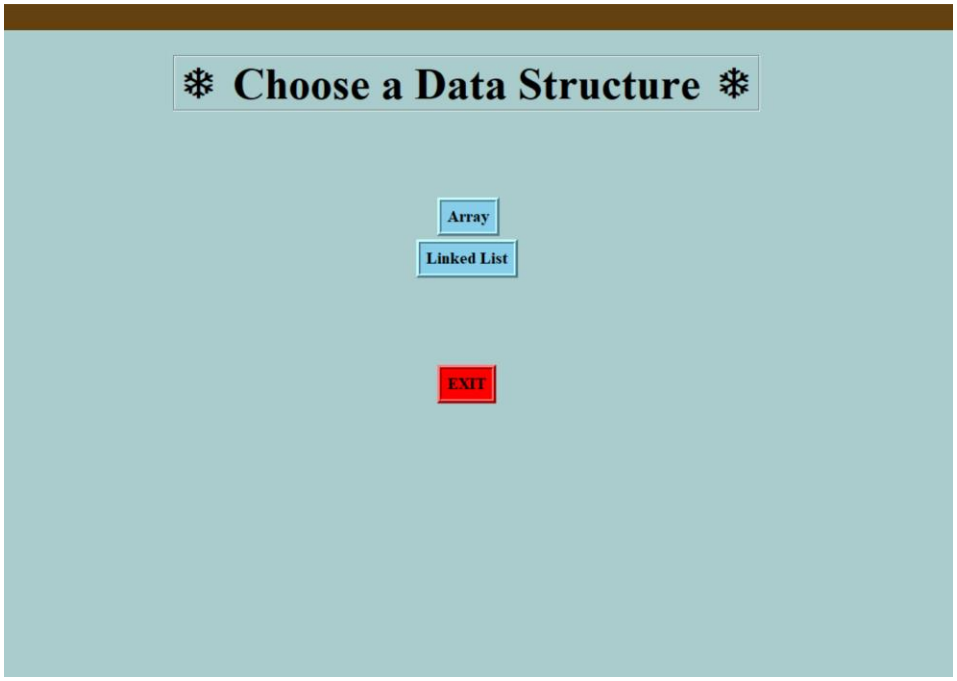
Objectives

The project aims to demonstrate basic data structure operations such as insertion, deletion, searching, and updating elements in both arrays and linked lists.

Description

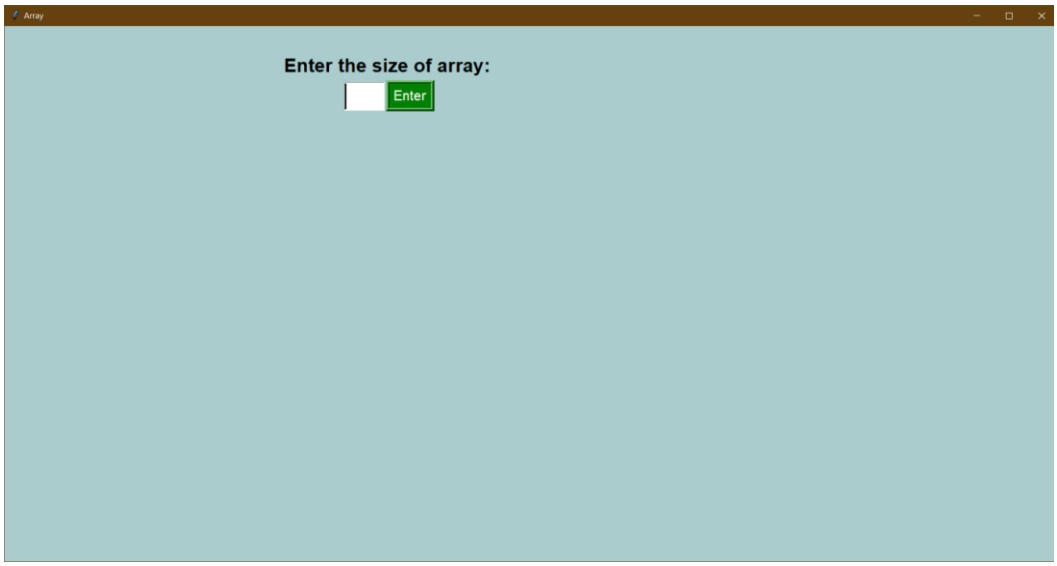
Home page:

This is the home page of the data structure project. There is two buttons. To perform array operation press "Array" button and, press the "Linked list" button to perform the linked list operation. And "Exit" button perform to exit this page.

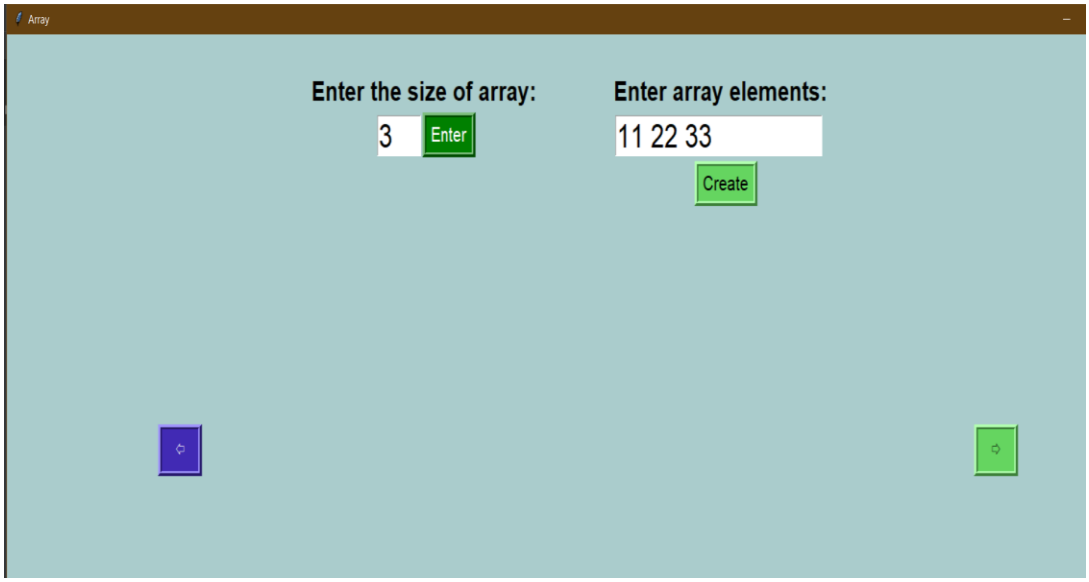


Array

By clicking the “array” button, go to the array page.

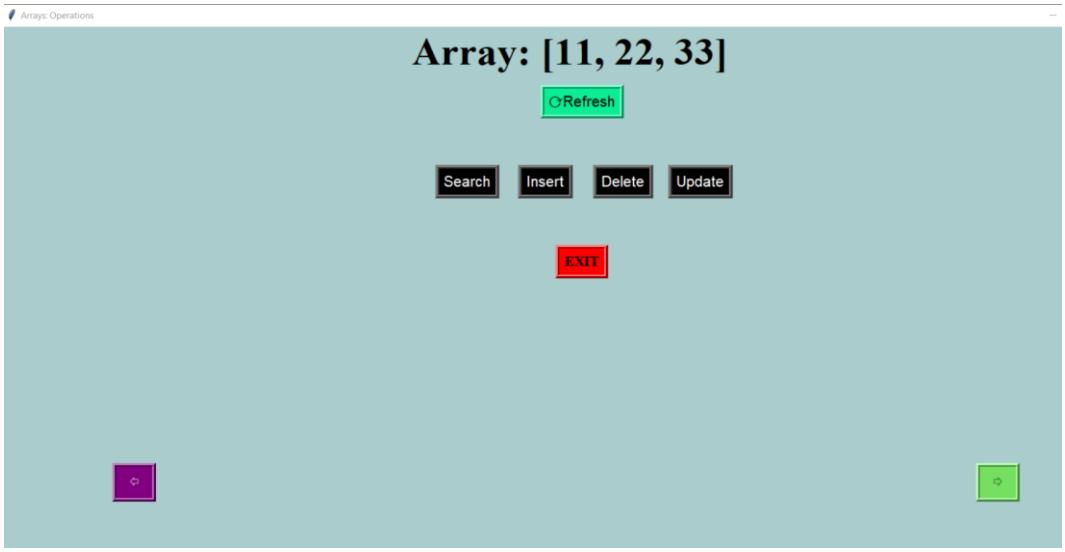


Create an Array: To create an array we should input the array size and then hit "Enter" button .Now we can see entry box for input the array elements. So enter the elements in the array. Then click "Create" button to create the array. If you want to go to the home page click "Back" button.



Array Operation:

After creating an array, you will see the array operation page. You can perform the search, insertion, deletion and update operations whichever you want. To do so, just press the desired button.

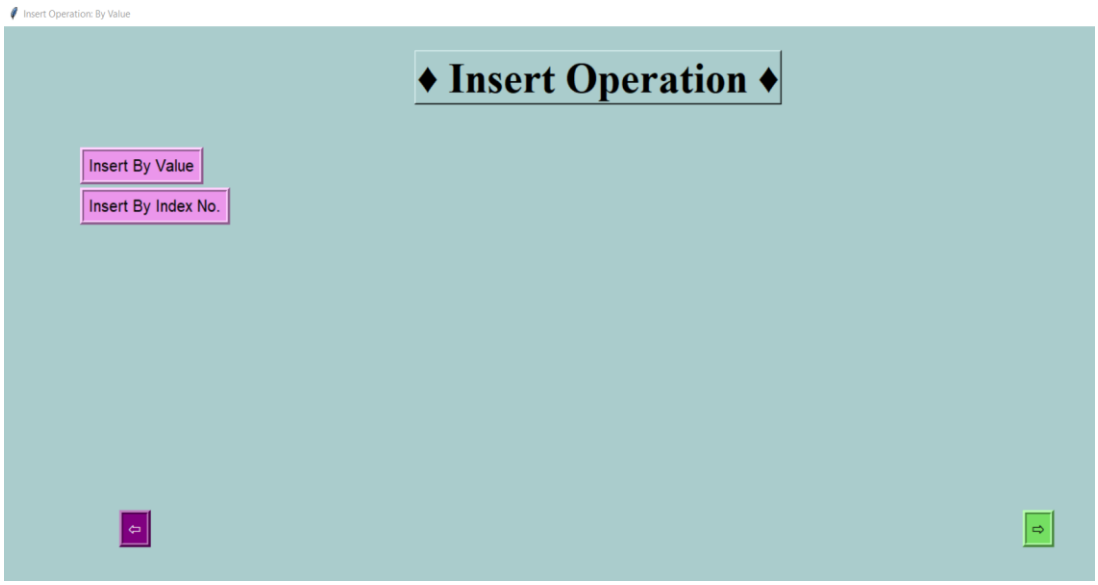


Search Element:

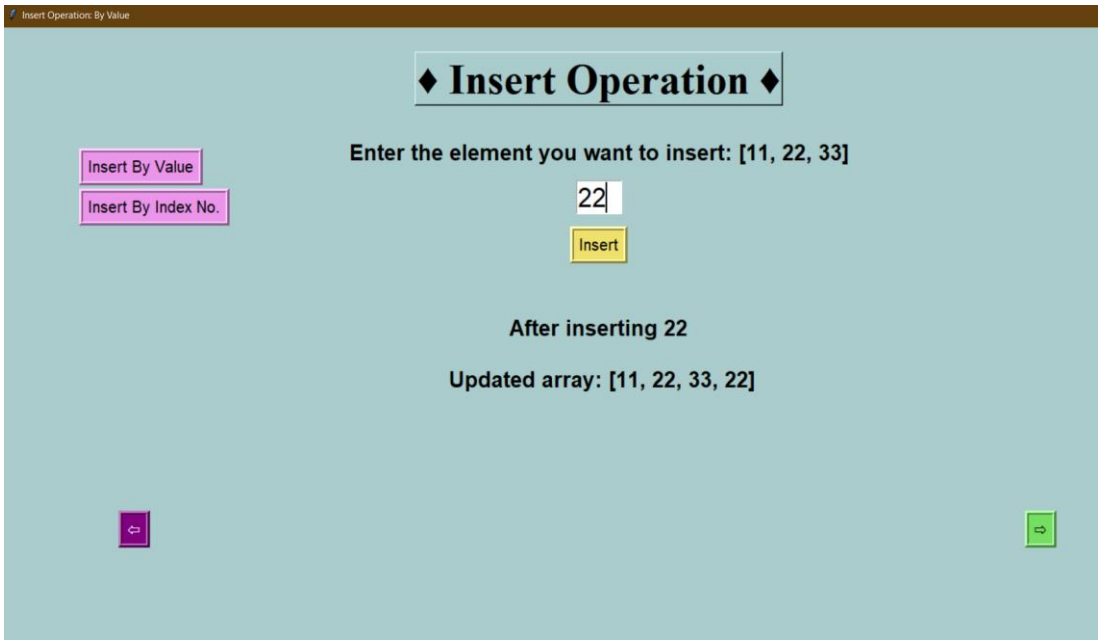
Enter the element you want to search in the array and hit “Search” button.

Insertion:

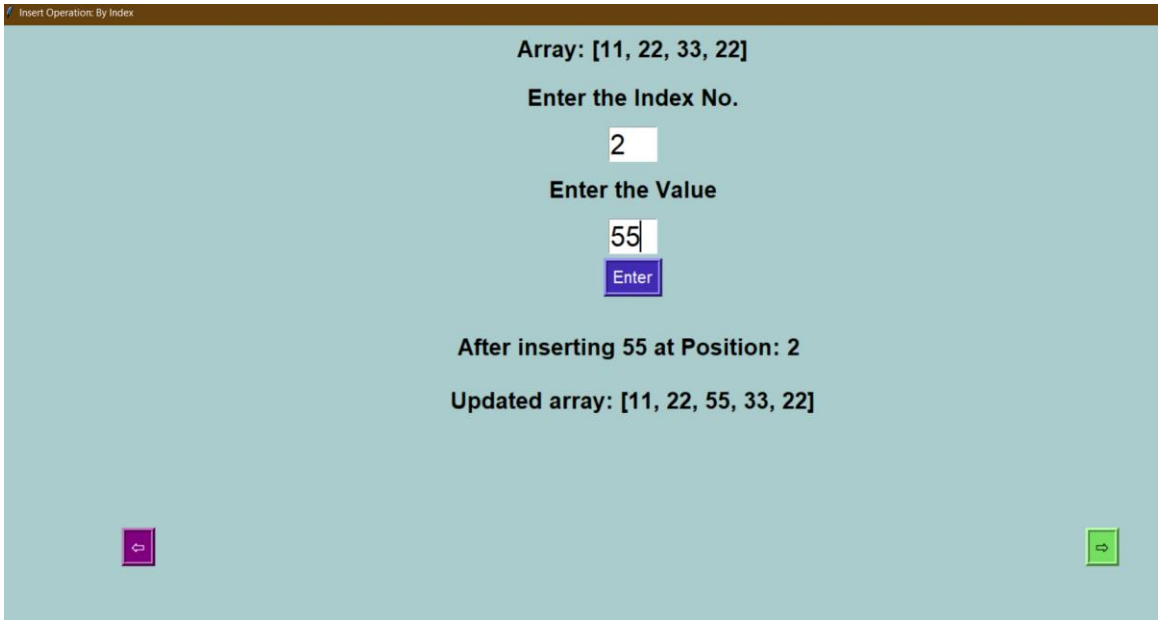
In the insert operation, you can insert a value in two ways, Insert by value & Insert by index no.



Insert by Value: Enter the value you want to insert and hit “Insert” button



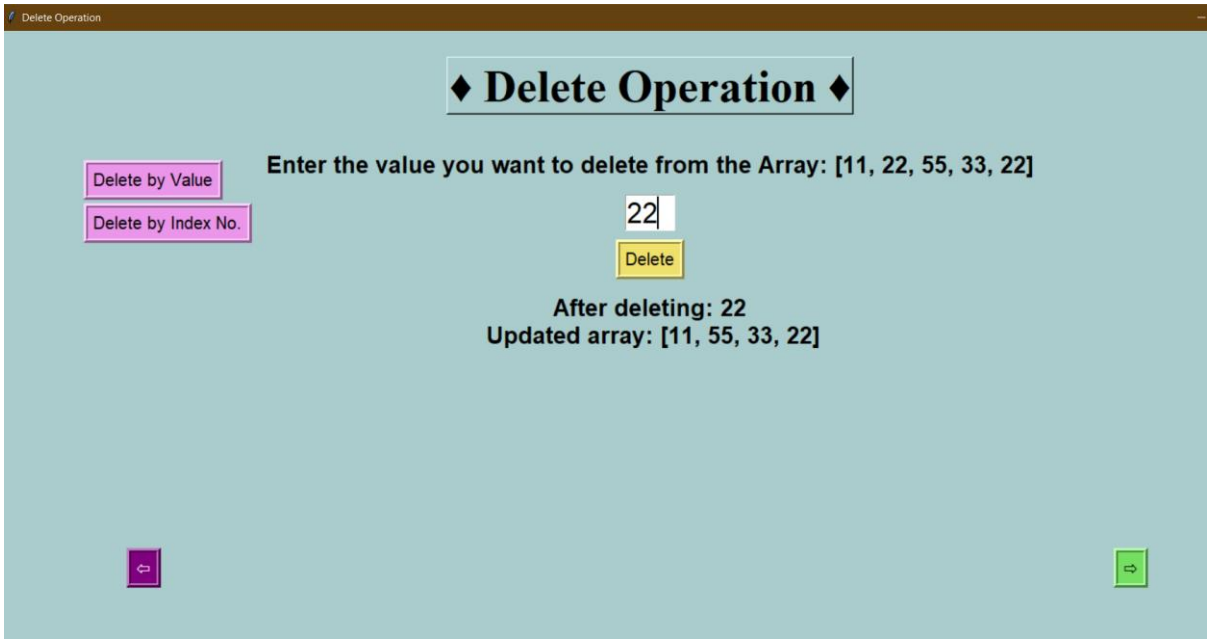
Insert by Index No: Enter the index number & value you want to insert and hit “Enter” button.



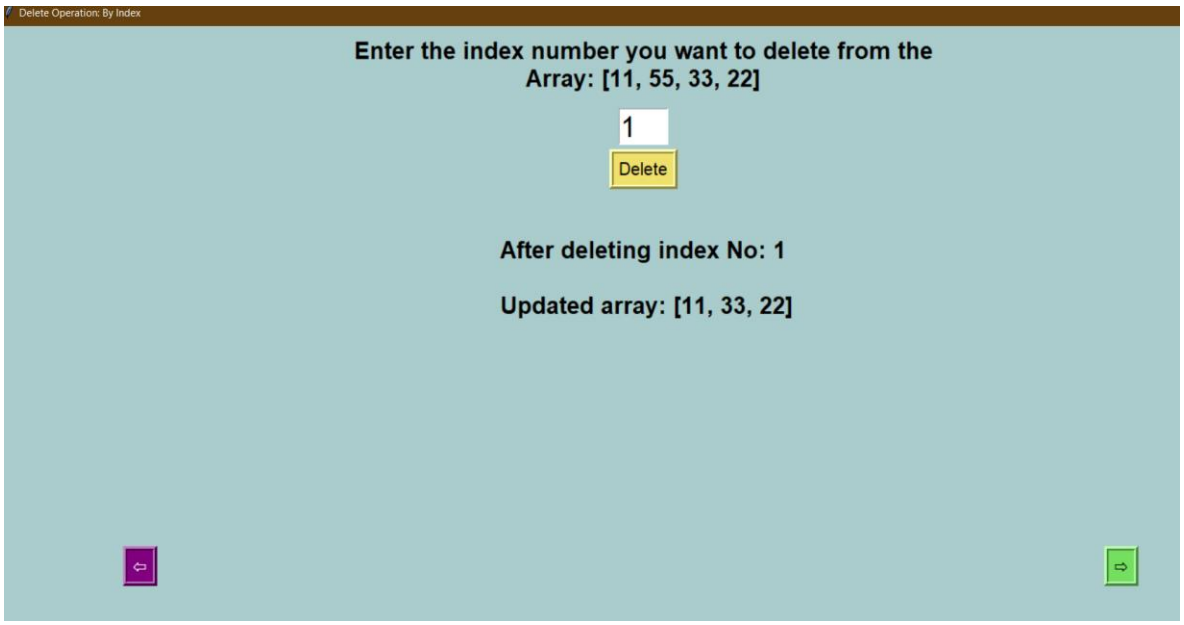
Deletion:

In the deletion operation, you can delete elements by indexing and by value.

Delete by Value: Enter the value you want to delete and hit "Delete" button.

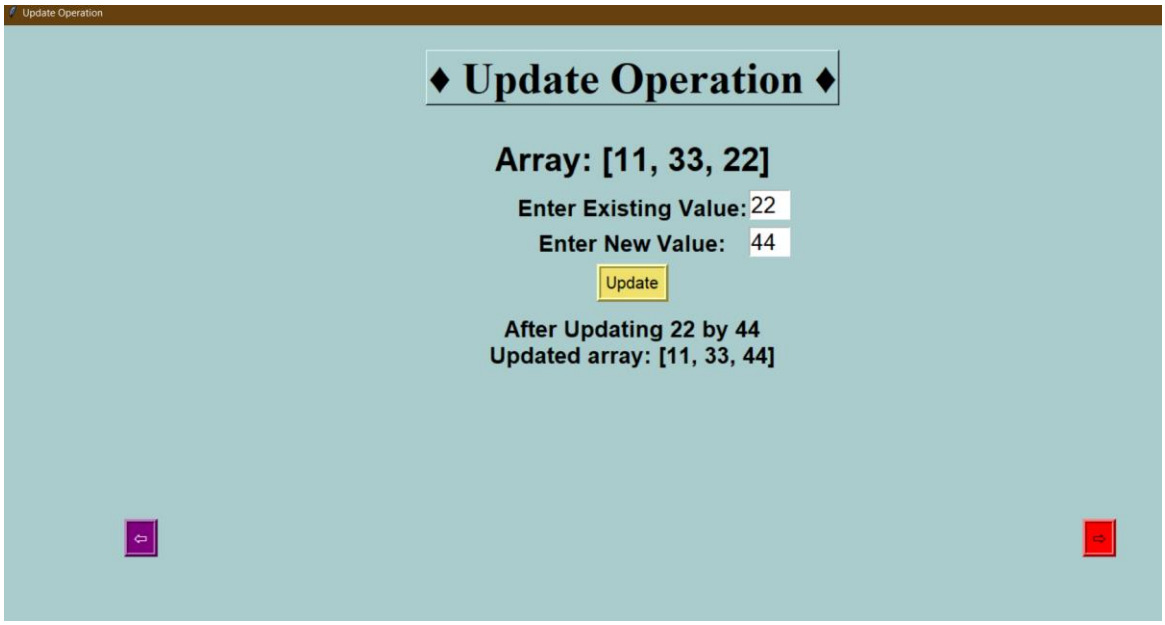


Delete by Index: Enter the index number you want to delete and hit "Delete" button.



Update:

In the first entry box input the old value that you want to update and in the second entry box enter the updated value and then hit "Update" button.

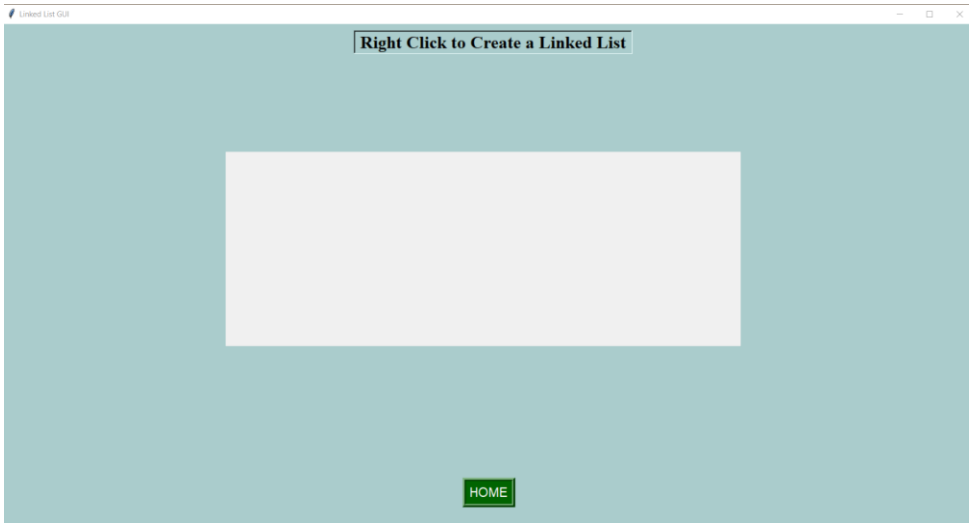


And, the array operation is finished here.

Linked list operation started on the next page…….

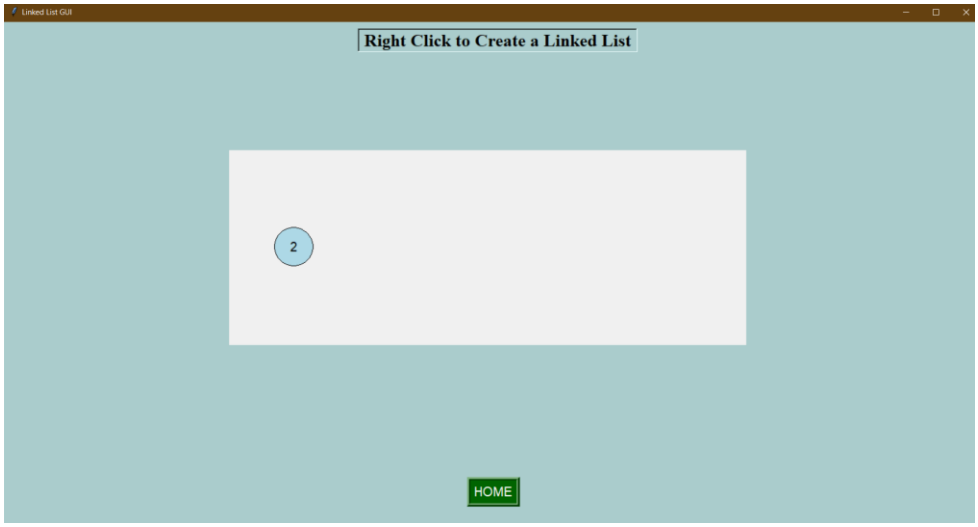
Linked list

By clicking the “Linked list” button, you go to the linked list page. At first, it is an empty page.



Create Linked list: To create a linked list you need to right click the mouse. Input as many values as you want and press the “OK” button.

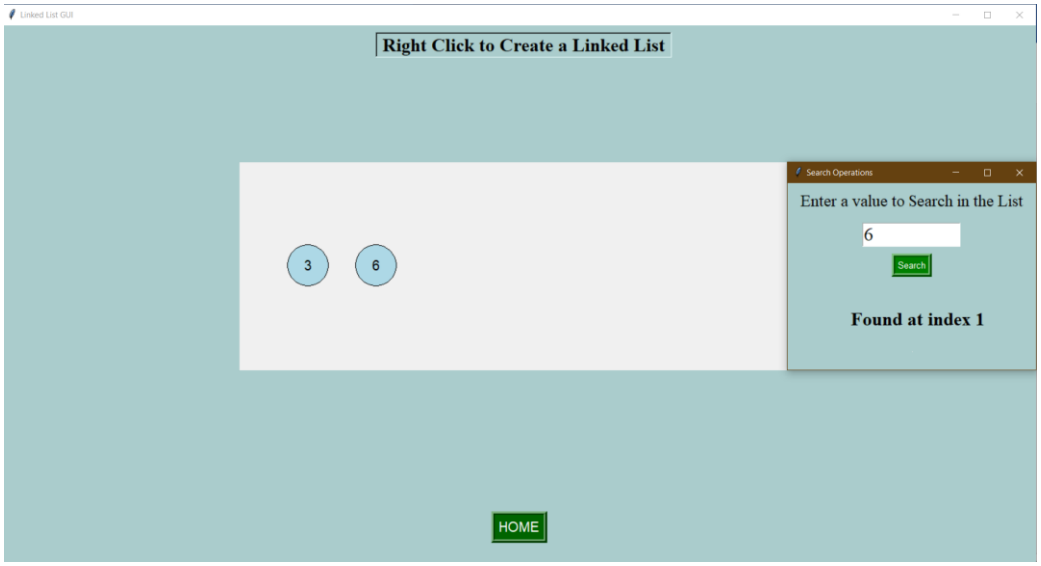
The list is shown in the next picture.



You can do any operation on the linked list .To do so, .you just need to click any node. After clicking on any node, you will see four buttons “Search”, “Insert”, “Delete”, “Update”. As shown below:

Search:

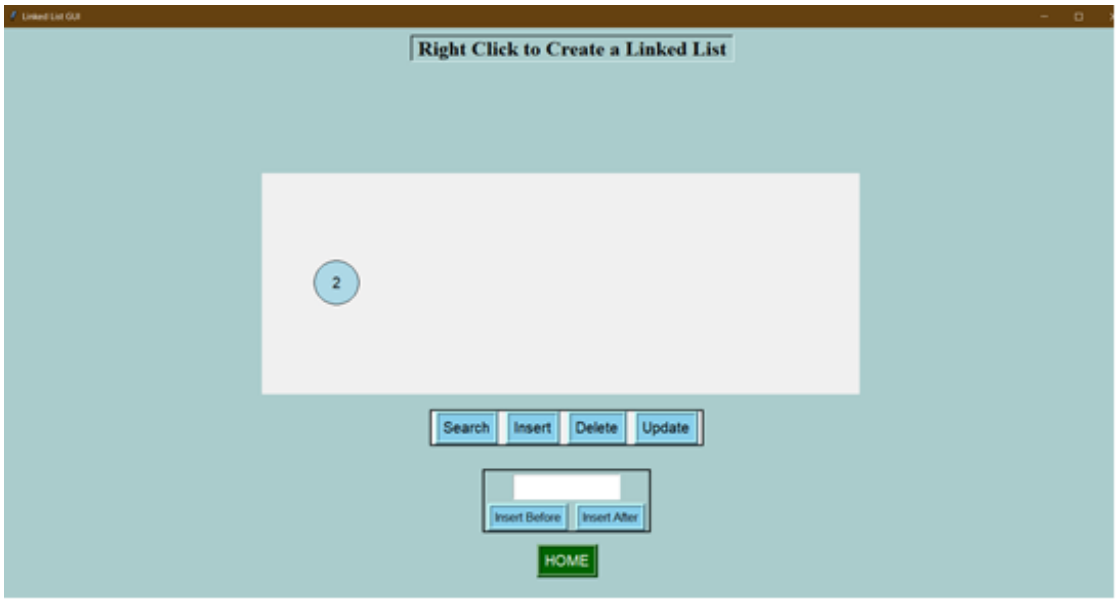
Search for a node in the linked list whether it is found or not. Enter the node element you want to search in the linked list then hit “Search” button.



Assume that you can searched “6” and “6” is found in the linked list.

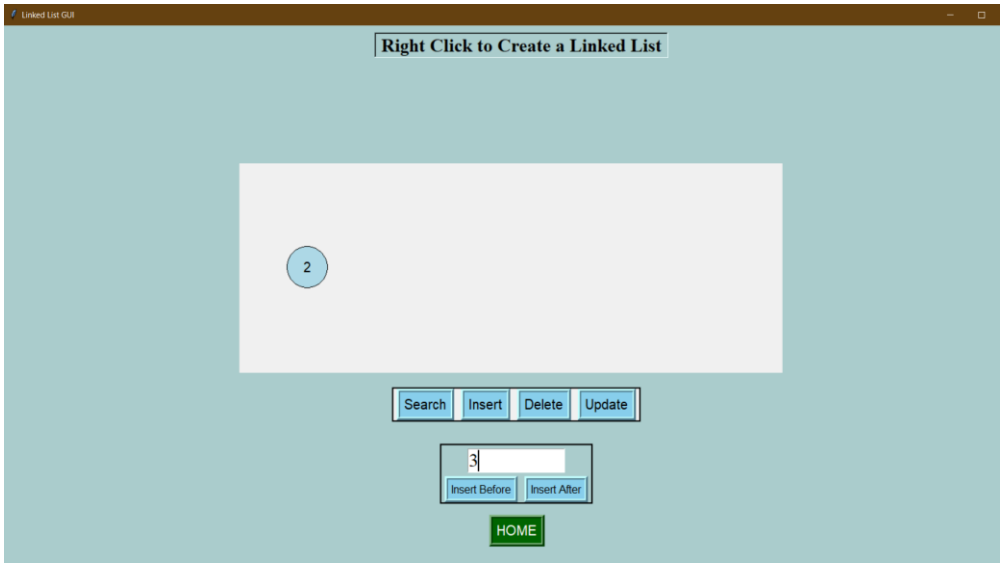
Insertion:

You can insert a node element in two ways. Insert before &Insert after.

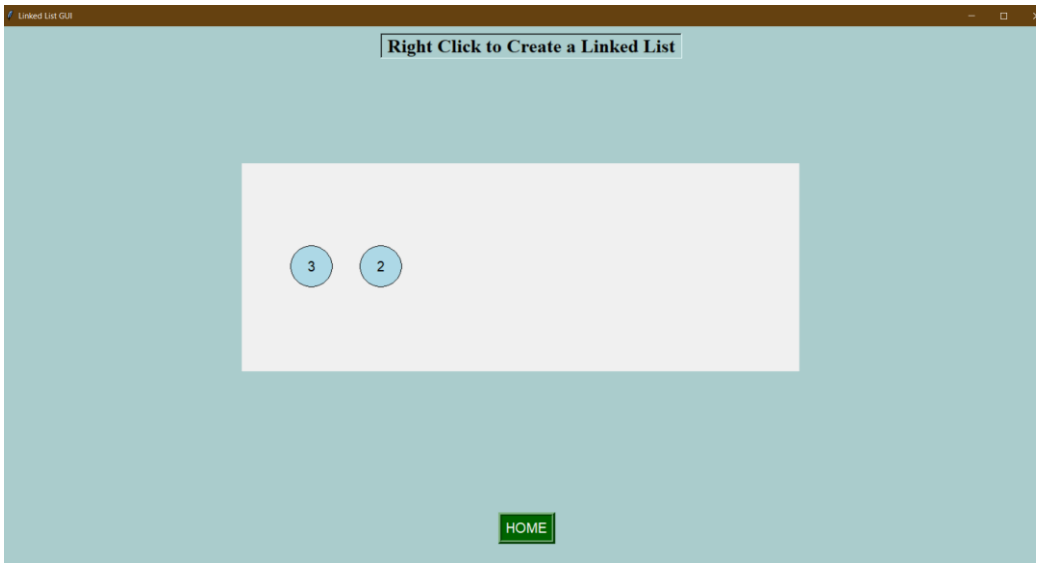


Insert Before:

To insert a node before current node, enter the node element in the entry box and press the “Insert Before” button.



Assume that you can insert “3” before the current node and then hit “Insert Before” button .you can see the result as the next picture.

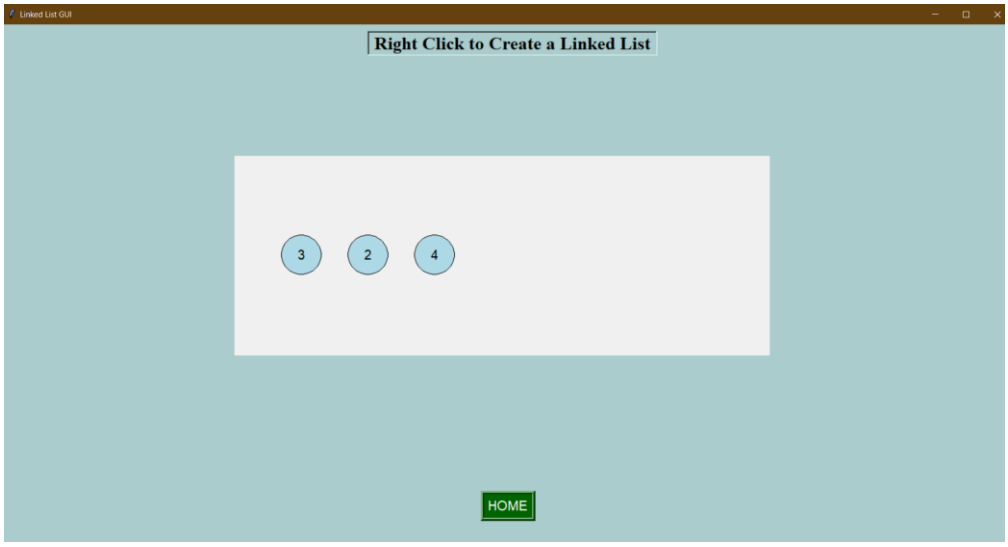


You can see the node element “3” is insert before the current node.

Insert After :

To insert a node after current node, enter the node element in the entry box andpress the “Insert After” button.

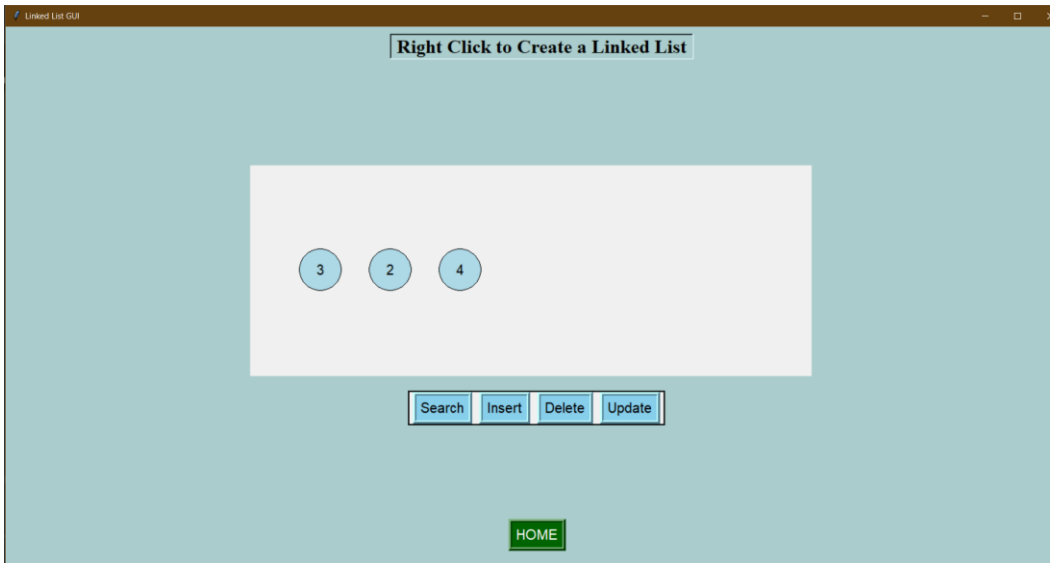
Assume that you can insert “4” after the current node and then hit “Insert After” button. you can see the result as the next picture.



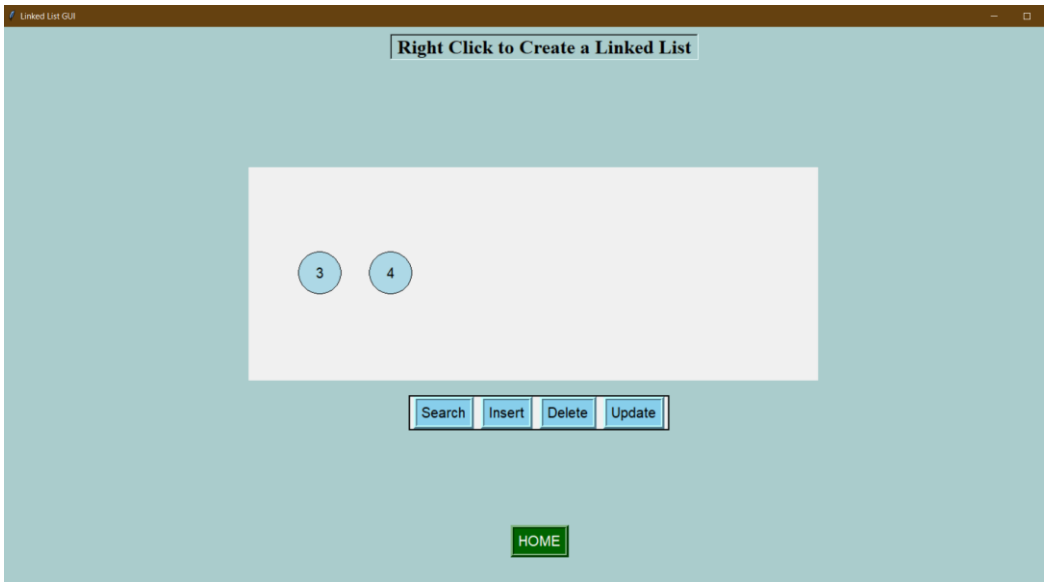
You can see the node element “4” is insert after the current node.

Deletion:

To delete a node ,click the node you want to delete and then hit “Delete” button.



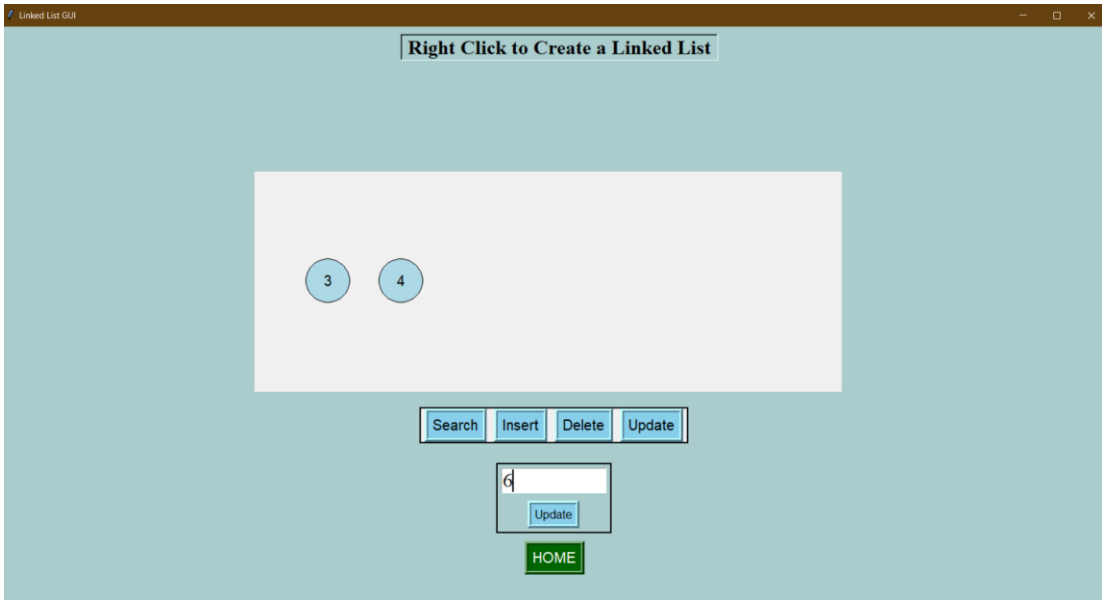
Assume that you can delete “2” and then hit “Delete” you can see the result as the next picture.



You can see the node “2” is deleted.

Update:

To update a node in the linked list, you have to enter the update node element at the entry box, and press the “Update” button.



You can see the update list as the next picture.

You can see the element “4” updated into “6”

Dependencies

Python 3.11.2: PyCharm lets you quickly and easily develop a Python project. For built this project we use Python language and Tkinter (Tk) built in library. After Installing all library the project will run successfully.

Python Language: We implement this data structure project in Python Language.

25 June, 2023

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