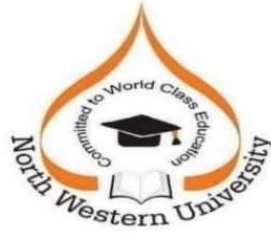


NORTH WESTERN UNIVERSITY



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 linked list operations using the Tkinter library for creating a graphical user interface (GUI).

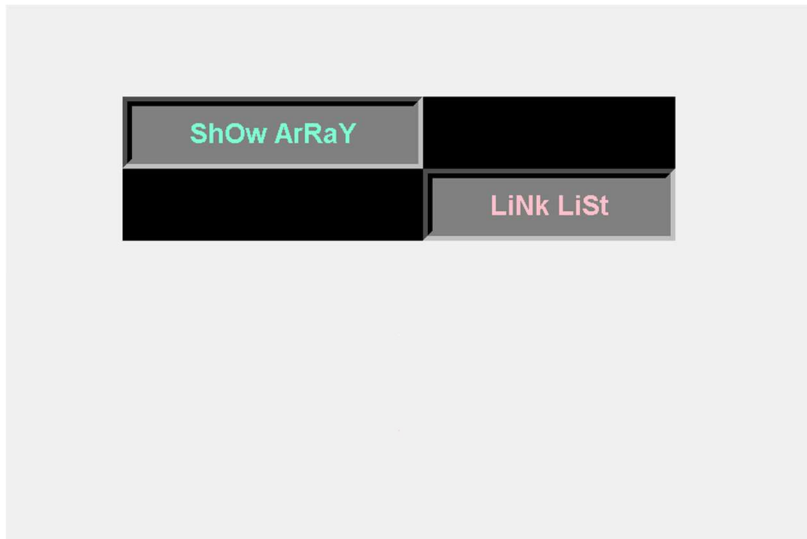
- An **array** is a data structure that stores a fixed-size sequence of elements of the same data type in contiguous memory locations.
- A **singly linked** list is a data structure consisting of a sequence of nodes, each containing a value and a reference (or link) to the next node in the sequence. It forms a linear collection of elements, where the order is determined by the links between nodes.

Objectives

Graphical User Interface or GUI is an interface that makes the interaction of humans with machines possible through graphical icons and audio indicators. The graphical elements are directly manipulated to make the interaction possible. MP3 players, portable media players, gaming devices, smartphones, and smaller households are some of the devices that use GUI. GUI uses a combination of multiple technologies of great significance and provides various advantages. Although many languages can be used for developing GUI, C# or Java is preferred the most.

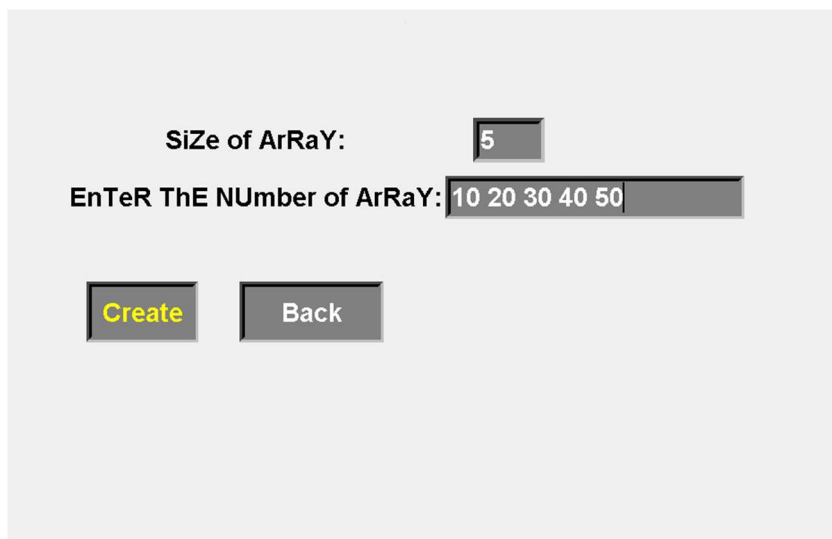
Home page:

This is the home page of the data structure project. There are two buttons. To perform an array operation press the Show Array button.



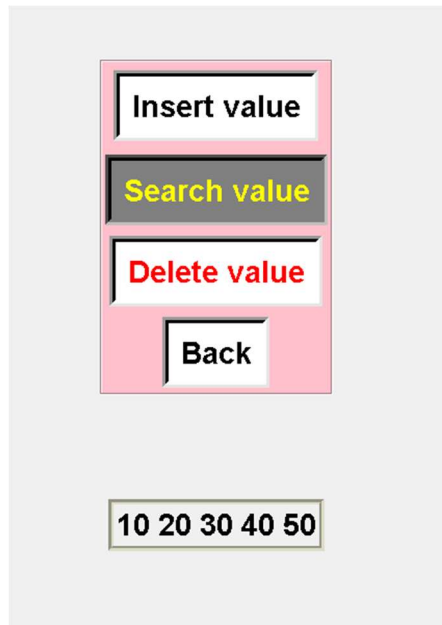
Show Array:

By clicking the show array button, you go to the array page.



Array Operation:

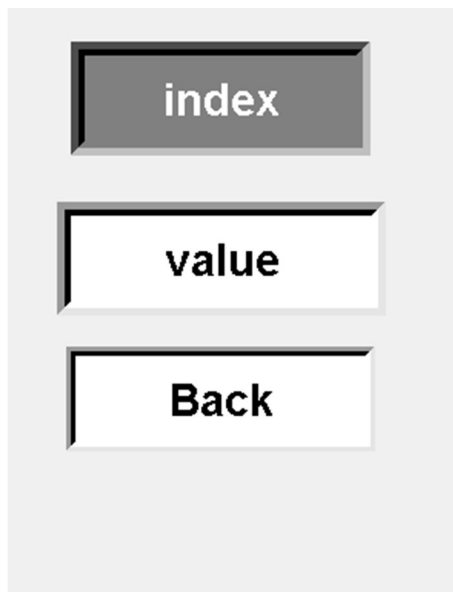
After creating Array, you will show the array operation page you can perform the Insert, Delete, and Search element operation you want to do just press the button.



A vertical stack of four buttons with a pink border, set against a light gray background. The buttons are labeled 'Insert value', 'Search value', 'Delete value', and 'Back'. Below this stack is a rectangular box containing the text '10 20 30 40 50'.

Insert Array :

In the insert operation, you can insert a value at any index. So you have select to Index.



A vertical stack of three buttons with a gray border, set against a light gray background. The buttons are labeled 'index', 'value', and 'Back'.

➤ So you have to input the value and the index number

Input Value:

Input Index No:

➤ After Insert the value and Index Number.

Search Array: Click on the Search Button.

Insert value

Search value

Delete value

Back


10 20 30 40 50 60

➤ Enter the element you want to search in the Array.



A search input form with a text box containing the number '50'. Below the text box are two buttons: 'Search' in blue text and 'Back' in yellow text.

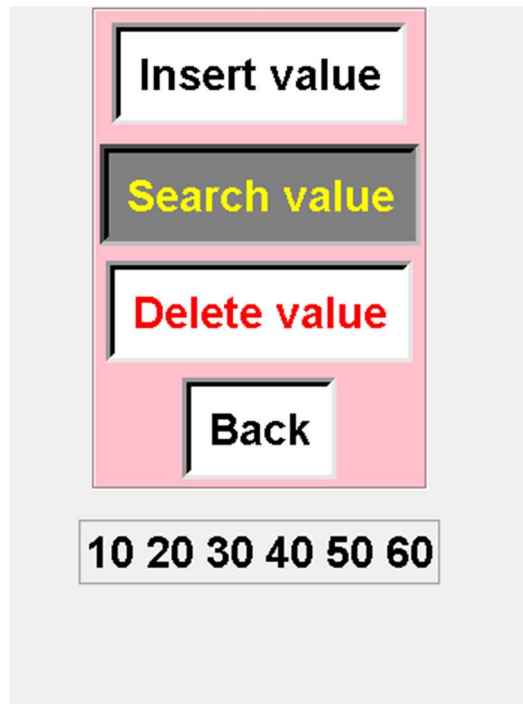
➤ Show The Array And Array Position.



A form displaying the result of a search. At the top, a message box says '50 Found On Position 5'. Below this is a pink-bordered container with four buttons: 'Insert value' (white), 'Search value' (yellow), 'Delete value' (red), and 'Back' (white).

Delete Array:

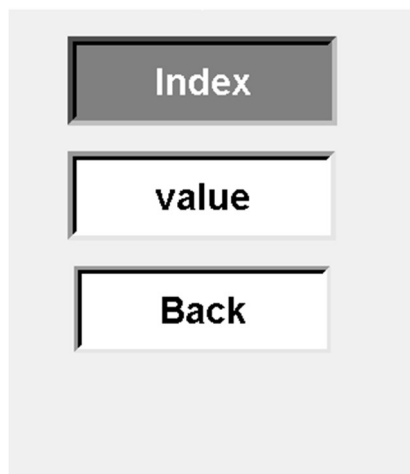
In the deletion operation, you can delete elements by indexing and delete by value.



A vertical interface for deleting array elements. It features a pink rectangular container with four buttons: 'Insert value' (white), 'Search value' (dark grey), 'Delete value' (white with red text), and 'Back' (white). Below the container is a white box containing the array elements '10 20 30 40 50 60'.

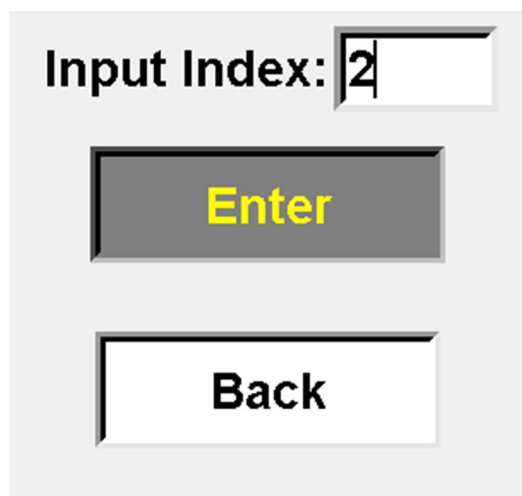
Delete by Index:

Click on the Index Button.



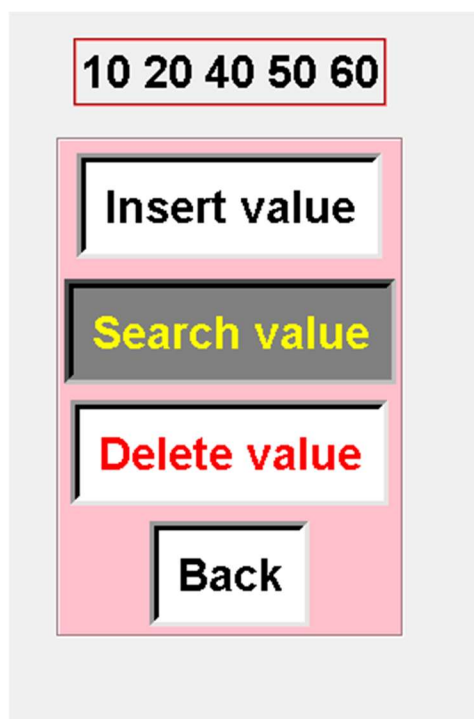
A vertical interface for deleting by index. It features three buttons: 'Index' (dark grey), 'value' (white), and 'Back' (white).

➤ Enter the index number you want to delete.



A screenshot of a web form with a light gray background. At the top, the text "Input Index:" is followed by a text input field containing the number "2". Below the input field are two buttons: a gray button with the text "Enter" in yellow, and a white button with the text "Back" in black.

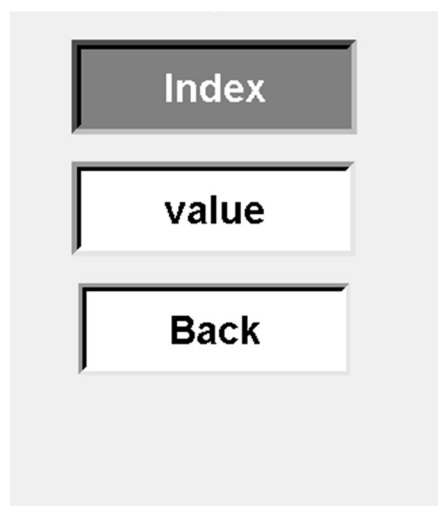
➤ Show the Array and we can see the Delete number of the Position Array.



A screenshot of a web form with a light gray background. At the top, a red-bordered box contains the array "10 20 40 50 60". Below this box is a pink-bordered container with four buttons: a white button with "Insert value", a gray button with "Search value" in yellow, a white button with "Delete value" in red, and a white button with "Back".

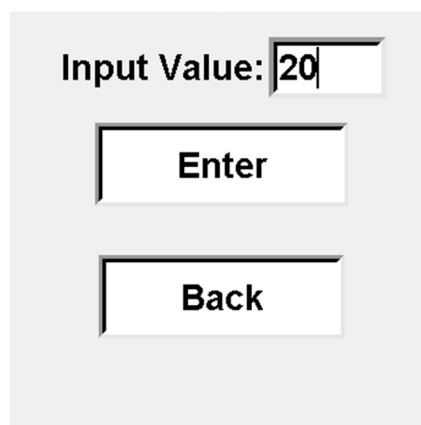
Delete by Value:

Click on the value button.



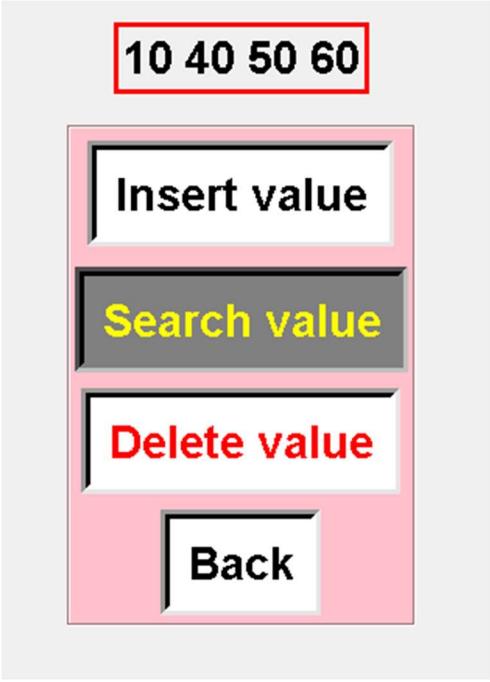
A dialog box with a light gray background. It contains three buttons stacked vertically. The top button is dark gray with the text "Index" in white. The middle button is white with the text "value" in black. The bottom button is white with the text "Back" in black.

➤ Enter the value you want to delete.



A dialog box with a light gray background. It contains an input field with the text "Input Value:" followed by a text box containing the number "20". Below the input field are two buttons stacked vertically: "Enter" and "Back", both in white boxes with black text.

➤ Show the Array and we can see the Delete number of the Array



10 40 50 60

Insert value

Search value

Delete value

Back