North Western University

User Manual

Course Code: CSE-2104
Course Title : Data Structure – Laboratory

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Introduction

Array: An array is a sequenced collection of data items that share a common name. It is also called the Linear Derived Data Type**.** We can use an array number ***num*** to represents a set of ***numbers*** of a group of employees in an organization. We can refer to the individual numbers by writing a number called ***index*** or ***subscript*** in brackets after the array name. Arrays in data structures help solve some high-level problems like the "longest consecutive subsequence" program or some easy tasks like arranging the same things in ascending order.

Linked List: A Linked List is a dynamic process data type. A completely different way to represent a list is to make each item in the list part of a structure that also contains a ***link*** to the structure containing the next item of list is called a linked list. Because it is a list whose order is given by links from one item to the next. Each structure of the list is called a node and consists of two fields, one containing the ***item***, and the other containing the ***address*** of the ***next*** item (a pointer to the next item) in the list.
A linked list is therefore a collection of structures ordered not by their physical placement in memory (like an array) but by logical links that are stored as part of the data in the structure itself. The link is in the form of a pointer to another structure of the same type.

Objectives

This is an array and linked list project of Data Structure Lab. This is a software base project. This project is built by Java language. It is a Java GUI attached program. GUI means Graphics User Interface. This GUI makes the project visually experienced. This java project has to some operation such as: Search, Insert, Update, Delete.

Search: To search an element according to the number or index/position.
Insert: To insert an element according to the number or position.
Update: To update an element according to the number or position for the replace.
Delete: To delete an element according to the number or position.

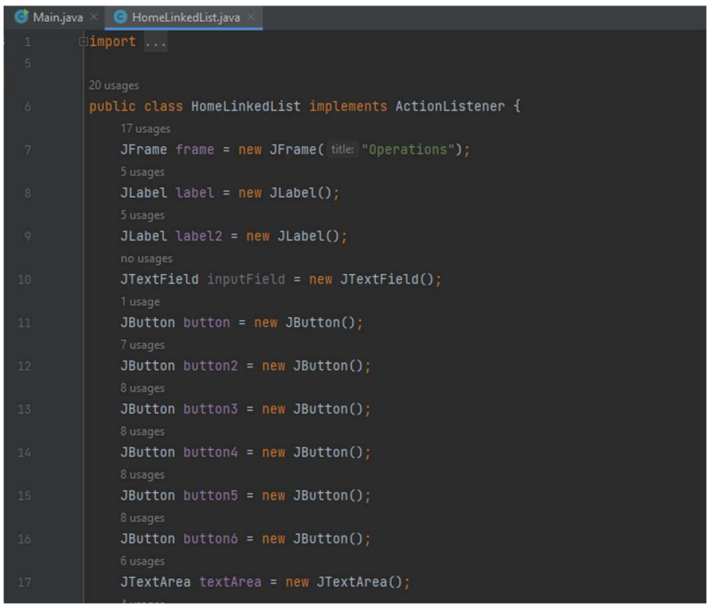
The operations of the project will be valid for both array and linked list elements. There are also two other options for the operations:

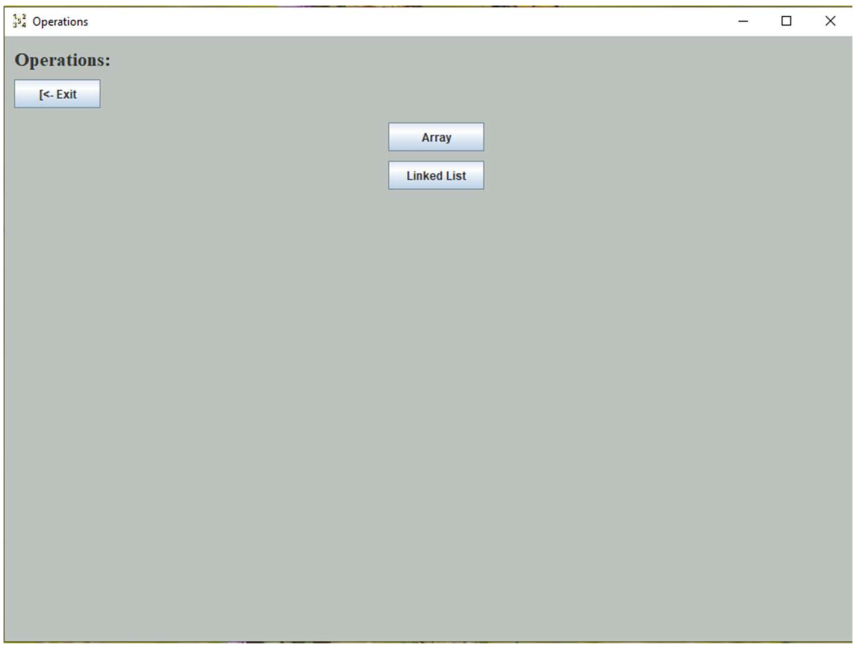
i. Position: It defines the index or sequential position of the set of array and linked list.
ii. Number: It defines the elements or number or value of the set of number and the linked list.

For more help:
YouTube Video Link: *https://youtu.be/rrx7lVv0tPc*

Descriptions

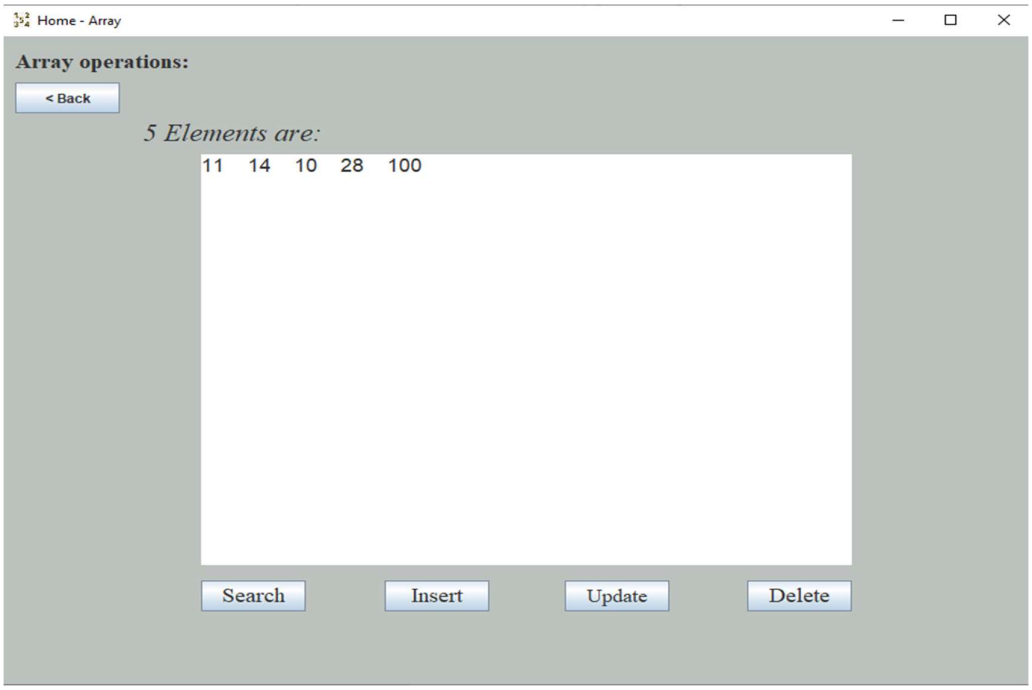
1. **GUI**: a GUI forms of the project is very important for this. It makes awesome and easier to visible and understand the process for the users. The users input data to the operator functions easily.





The Java GUI program used by “JFrame” function for first interface.

2. **Array**: An array operation is produced. Users select ‘Array’ option then ‘Create’ and then Enter ‘Size of Array’. At last, they input the ‘Elements’ (numbers) and click ‘Finish’ to go to the ‘Home’ page for the array operation.

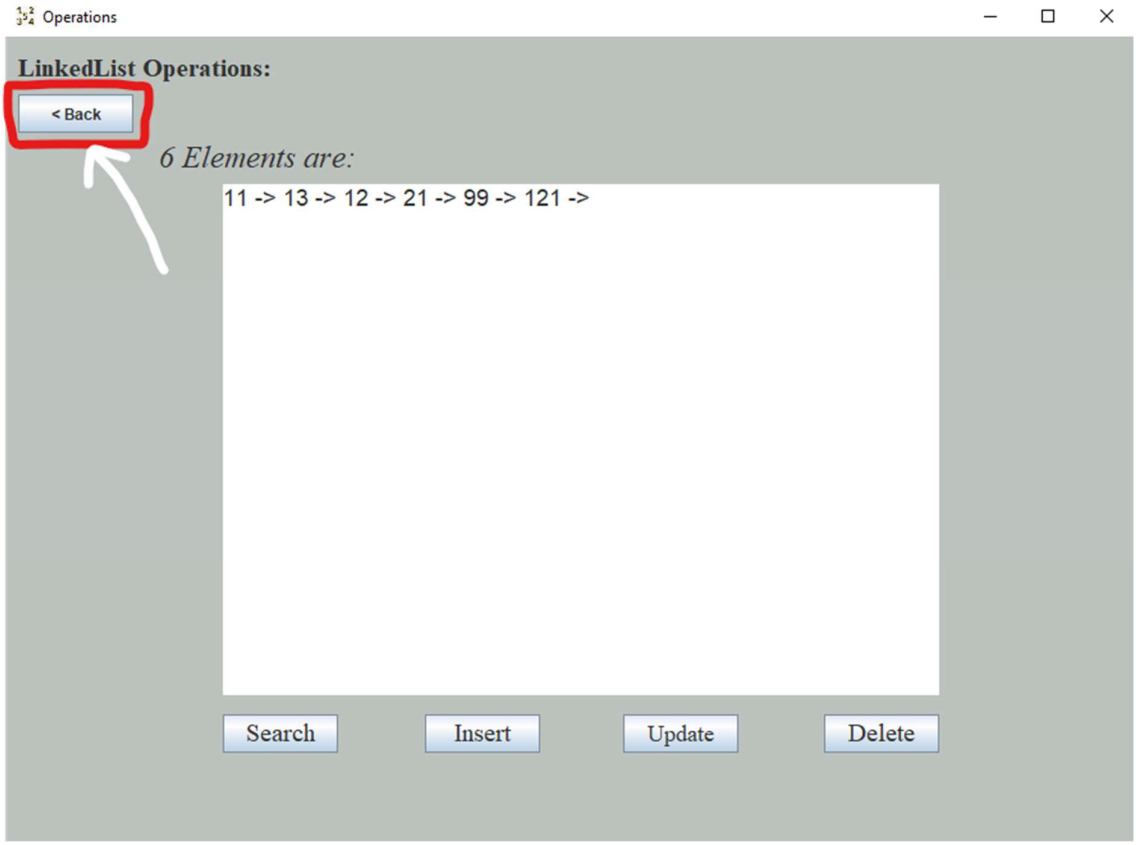


There are shown the button for Search, Insert, Update, Delete.

3. **Linked List**: A linked list operation is produced. Users select ‘Linked List’ option then ‘Create’. At last, they input the ‘Elements’ (numbers) as the size of list that user wants. After complete the input, click ‘Display’ to go to the ‘Home’ page for the Linked List operations.

This is the Home page. User can operate the numbers from here. Operate buttons are shown below of the page.

Note: There are also a ‘Back’ button to go to back position or page. If user make wrong or mistake to operate function, they can go to back by the click Back.



Dependencies

IntelliJ IDEA: This is an application software to built or design a Java GUI project. It makes easier to write the codes and design a GUI. It works and build project by “JDK-19” extension file.

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