https://Arrayoperations\frontpage

PES UNIVERSITY

WELCOME TO ARRAY OPERATION PROJECT

IIII0

GET STARTED

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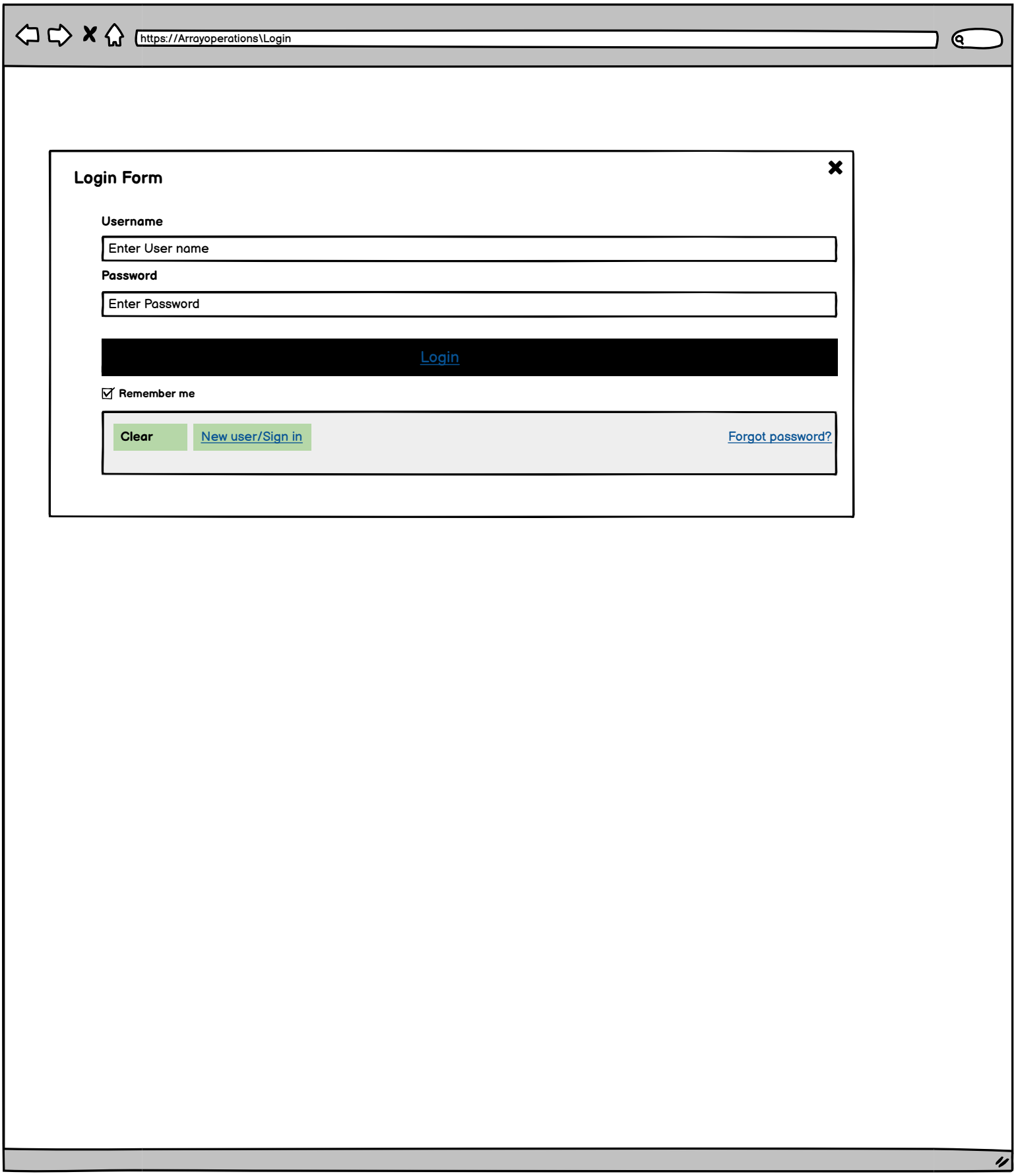
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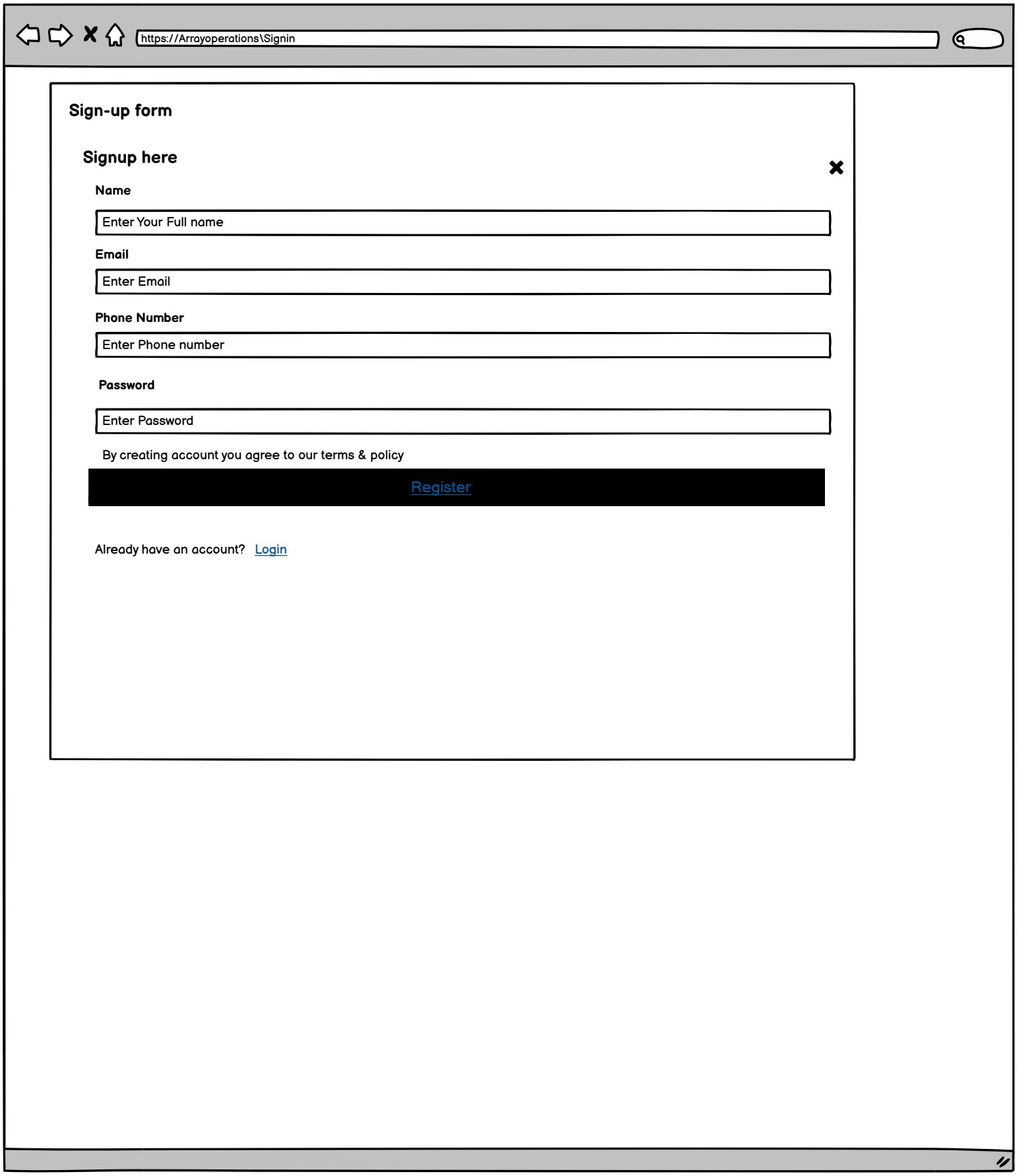
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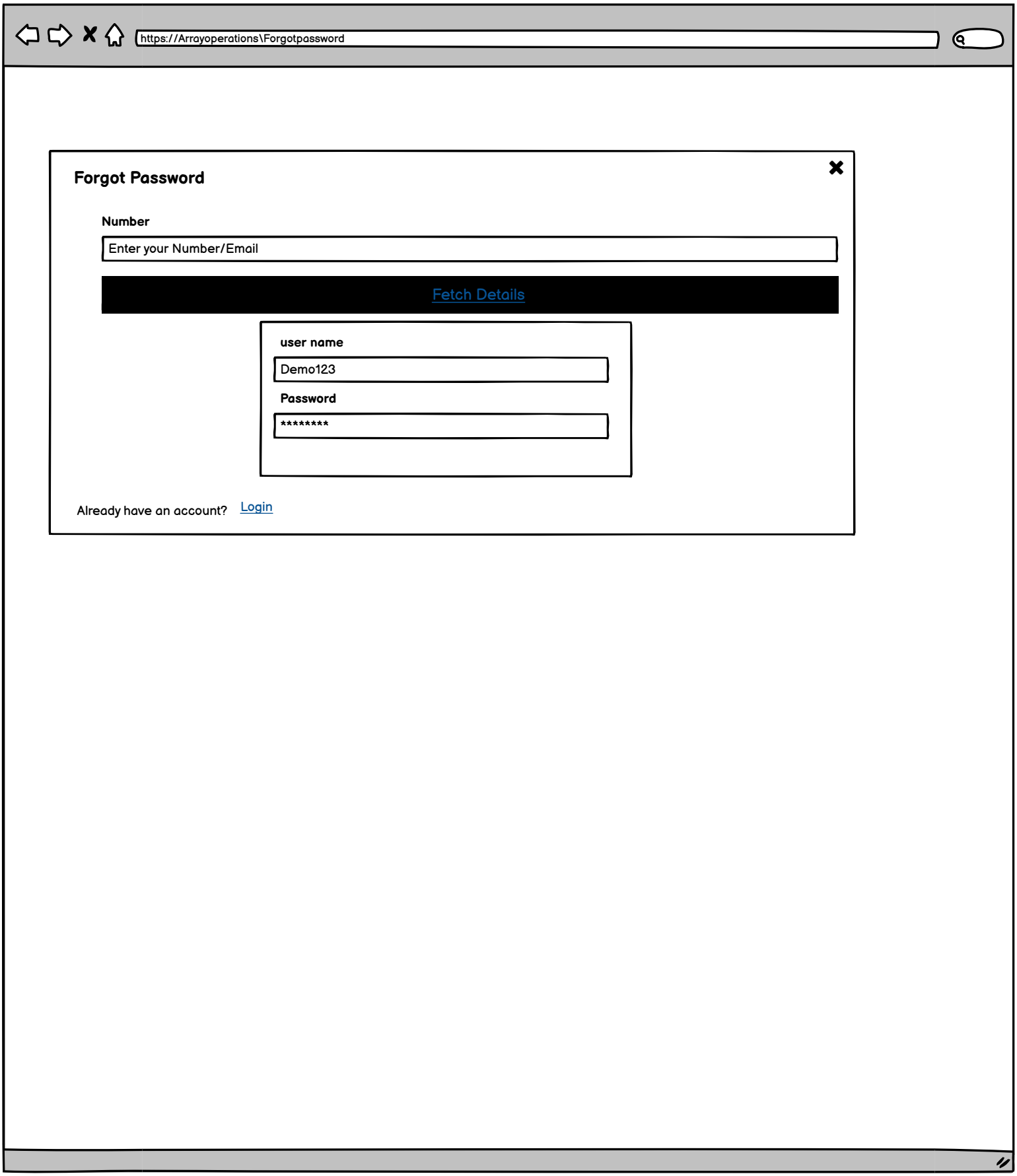
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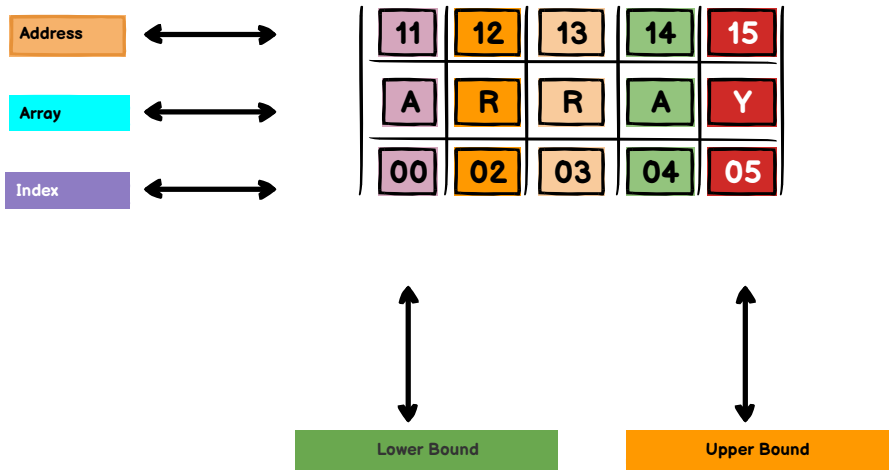
ARRAYS



Array is a container which can hold a fix number of items and these items should be of the same type. Most of the data structures make use of arrays to implement their algorithms. Following are the important terms to understand the concept of Array.

Element – Each item stored in an array is called an element.
Index – Each location of an element in an array has a numerical index, which is used to identify the element.

Array Representation

Now that we know the basic idea behind an array, let us now look at the various operations that can be performed on arrays.

What is an array?

An array is a data structure that stores homogeneous/same data type values in it, and the data is stored in contiguous memory locations.
We can perform the different operations on Arrays like

Insertion
Replacement/Updation
Deletion
Traversal
Searching
Sorting

Let's look at each of the above operations one by one:

https://Arrayoperations\Insertion

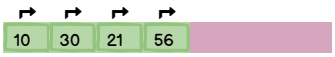
8:30AM

Array Insertion

Insertion in Linear Array-an element at the 1st position(0th Index) of the array:

In this case we have to move all the elements one position backwards to make a hole at the beginning of array. Though the insertion process is not difficult but freeing the first location for new element involves movement of all the existing elements. This is the worst case scenario in insertion in a linear array.

Initially



After movement of element backwords

After insertion

Insertion in Linear Array- at the location after the last element of the array:

In this case we don't have to move any elements since the action here will be just to append the element at the location after the last element. This is the best case scenario.

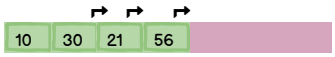
Initially

After insertion

Insertion in Linear Array- at the give position i:

Let i be any location in the array of one element already existing. We have to add the new element at i position. To do this, starting from i, every element is moved one place backwards so that a hole is created at i and new element can be inserted here. This is the average case scenario.

Initially



After movement of element backwords

After insertion


```
Algorithm to Insert an element in an Array:
Step 01: Start
Step 02: [Reset size of the array. ] set size = size + 1
Step 03: [Initialize counter variable. ] Set i = size - 1
Step 04: Repeat Step 05 and 06 for i = size -1 to i >= pos -1
Step 05: [Move ith element forward. ] set arr[i+1] = arr[i]
Step 06: [Decrease counter. ] Set i = i - 1
Step 07: [End of step 04 loop. ]
Step 08: [Insert element. ] Set arr[pos-1] = x
Step 09: Stop
```

ARRAY INSERTION

Enter the Number of elements : (Max 10)

4

Enter-Element

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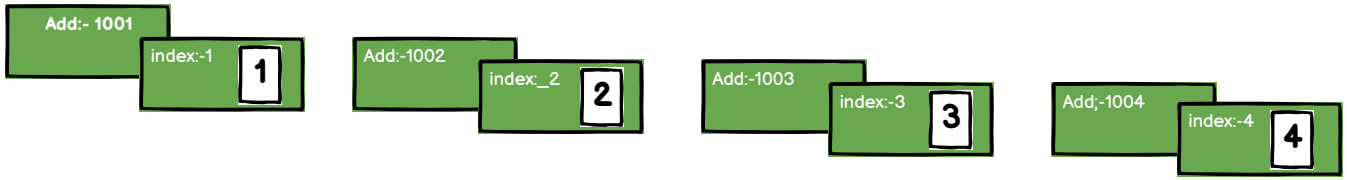
Array Applications

Sample insertion animation

Home Insertion Extraction Application About Us Take quiz

Array Elements are



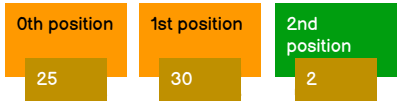
https://Arrayoperations\Insertion\Getoutput

Insertion

Inserting 25 at 0th position of array[0]

Inserting 30 at 1st position of array[1]

Inserting 2 at 2nd position of array[2]



Inserting 29 at 3rd position of array[3]

back

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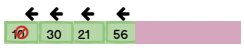
Deletion in Array- an element at the 1st position(0th Index) of the array:

In this case we have to move all the elements one position forward to fill the position of the element at the beginning of array. Though the deletion process is not difficult but moving all elements one position forward involve movement of all the existing elements except the one being deleted. This is the worst case scenario in deletion in a linear array.

Initially

Deletion



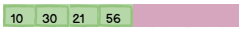
After deletion

Deletion in Array – removing the last element of the array:

In this case we don't have to move any elements since the action here will be just removing the last element. This is done by redefining the index of last element of linear array = N-1. This is the best case scenario in deletion in a linear array.

Take quiz

Initially



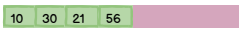
Deletion

After deletion

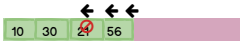
Insertion in Linear Array- at the give position i:

Let i be any location in the array for one existing element. We have to delete the element at i position. To do this starting from i every element is moved one place forward so that the element after index i comes to position of ith element. This is the average case scenario in deletion in linear array.

Initially



Deletion



After Deletion

To view the algorithm of extraction place your mouse over the text below

Algorithm of extraction

```
Algorithm to Delete an element from an Array:
Step 01: Start
Step 02: [Initialize counter variable. ] Set i = pos - 1
Step 03: Repeat Step 04 and 05 for i = pos - 1 to i < size
Step 04: [Move ith element backward (left). ] set a[i] = a[i+1]
Step 05: [Increase counter. ] Set i = i + 1
Step 06: [End of step 03 loop. ]
Step 07: [Reset size of the array. ] set size = size - 1
Step 08: Stop
```

ARRAY EXTRACTION

To display the elements inserted previously in the insertion page

DISPLAY-ARRAY | REFRESH PAGE

DELETE FIRST ELEMENT OF AN ARRAY | DELETE LAST ELEMENT OF AN ARRAY | DISPLAY-ARRAY

15 25 35

if input not entered Then by default index number *0-th element will be deleted

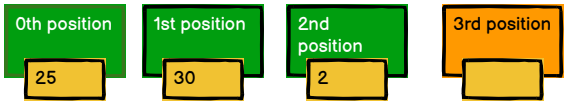
DELETE ARRAY ELEMENT USING ARRAY INDEX... | DISPLAY-ARRAY

DELETE ARRAY ELEMENT USING ARRAY ELEMENT DATA | DISPLAY-ARRAY

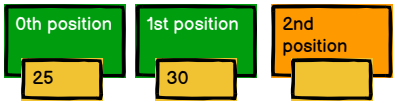
https://Arrayoperations\Extraction\Getoutput2

Extraction

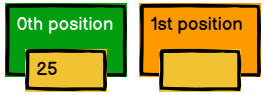
deleting 29 from 3rd position of array[3]



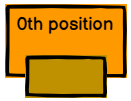
Inserting 30 from 1st position of array[1]



Inserting 2 from 2nd position of array[2]



Inserting 29 from 3rd position of array[3]



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Array Applications

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Array Applications :-

1) Arrangement of the leader-board of a game can be done simply through arrays to store the score and arrange them in descending order to clearly make out the rank of each player in the game.
2)D arrays, commonly known as, matrices, are used in image processing.
3) Arrays can be used for sorting data elements. Different sorting techniques like Bubble sort, Insertion sort, Selection sort etc use arrays to store and sort elements easily.

4)Your viewing screen is also a multidimensional array of pixels.

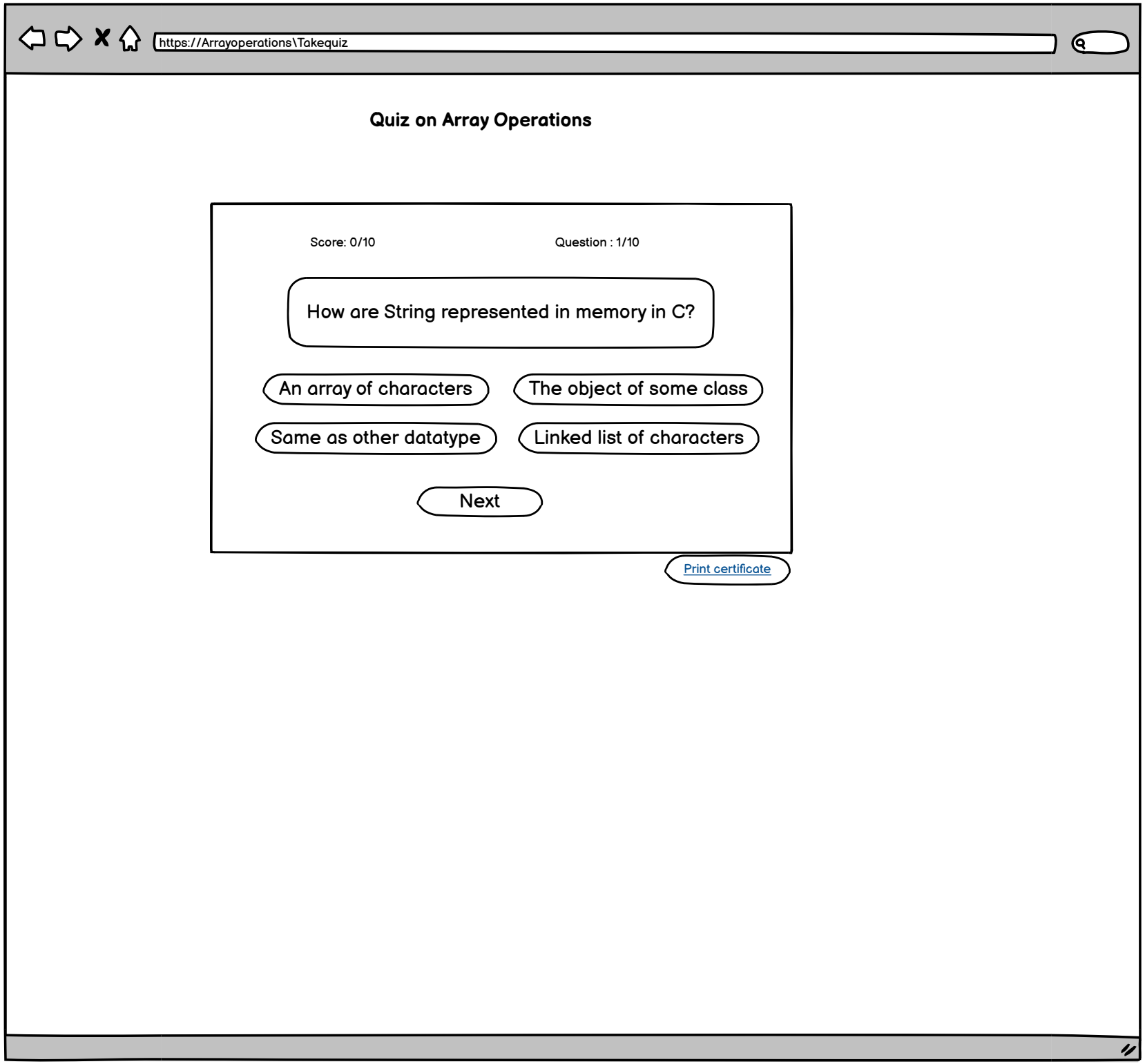
5) Arrays can be used for CPU scheduling.

6)Online ticket booking.

7)Contacts on a cell phone.

8) Lastly, arrays are also used to implement other data structures like Stacks, Queues, Heaps, Hash tables etc.

THANK YOU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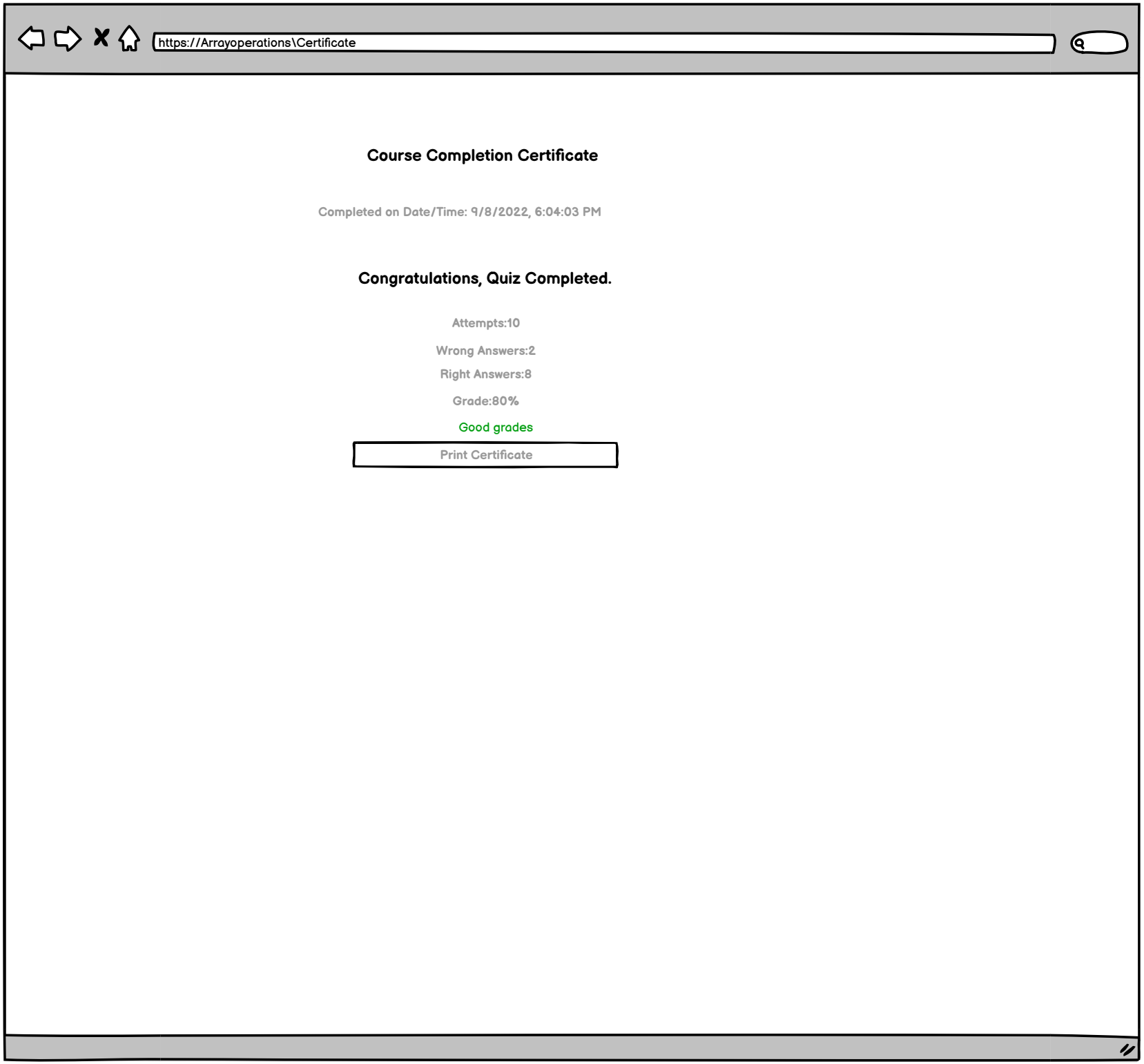
Quiz on Array Operations
Score: 0/10
Question : 1/10
How are String represented in memory in C?
An array of characters
The object of some class
Same as other datatype
Linked list of characters
Next
Print certificate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Congratulations, Quiz Completed.
Attempts:10
Wrong Answers:2
Right Answers:8
Grade:80%
Good grades
Print Certificate

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