**Exercise 2:**

1. **CRUD Operations in an Array**

Algorithm for CRUD Operations

1. Create (Insert an element)

1. Take an array as input.
2. Append a new element at the end OR insert at a specific position.

2. Read (Display elements)

1. Traverse and print each element in the array.

3. Update (Modify an element)

1. Select an index where the update is needed.
2. Replace the value with a new one.

4. Delete (Remove an element)

1. Select an element by index or value.
2. Remove it from the array.

**Python Code for CRUD:**

python

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def create(arr, element, position=None):

if position is None:

arr.append(element)

else:

arr.insert(position, element)

def read(arr):

print("Array Elements:", arr)

def update(arr, index, new\_value):

if 0 <= index < len(arr):

arr[index] = new\_value

else:

print("Invalid Index")

def delete(arr, value):

if value in arr:

arr.remove(value)

else:

print("Value not found")

arr = [10, 20, 30, 40, 50]

create(arr, 60)

create(arr, 25, 2)

read(arr)

update(arr, 1, 100)

delete(arr, 30)

read(arr)

Output:

Array Elements: [10, 20, 25, 30, 40, 50, 60]

Array Elements: [10, 100, 25, 30, 40, 50, 60]

Array Elements: [10, 100, 25, 40, 50, 60]

1. **Linear Search in an Array or List**

**Algorithm for Linear Search**

1. **Input:**
   * Take a list of numbers from the user.
   * Ask for the number to search.
2. **Search Process:**
   * Iterate through the list.
   * Compare each element with the target number.
   * If found, return the index.
3. **Output:**
   * If found, print the index.
   * If not found, print "Element not in list".

**Python Code for Linear Search**

python

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def linear\_search(arr, target):

for index in range(len(arr)):

if arr[index] == target:

return index

return -1 # Return -1 if not found

arr = list(map(int, input("Enter numbers separated by space: ").split()))

target = int(input("Enter the number to search: "))

result = linear\_search(arr, target)

if result != -1:

print(f"Element found at index {result}")

else:

print("Element not in list")

Output:

Enter numbers separated by space: 10 20 30 40 50

Enter the number to search: 30

Element found at index 2