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Test Series

Introduction to 'C' Language

Arrays and Strings in C Language

Module 02 - Searching, Insertion and Deletion in One dimensional Array in C Language

Searching in an Array

Searching is the process of finding the position of a particular element in an array. There are two common techniques:

Linear Search Program

This program searches for a specific value in an array using linear search.

```
c Copy code
#include <stdio.h>

int main() {
    int arr[5] = {10, 20, 30, 40, 50};
    int n = 5, searchValue, i, found = 0;

    printf("Enter the value to search: ");
    scanf("%d", &searchValue);

    for (i = 0; i < n; i++) {
        if (arr[i] == searchValue) {
            printf("Value %d found at position %d.\n", searchValue, i + 1);
            found = 1;
            break;
        }
    }

    if (!found) {
        printf("Value %d not found in the array.\n", searchValue);
    }

    return 0;
}
```

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### Insertion in an Array

Insertion involves adding a new element to an array at a specific position.

Steps:

1. Shift elements to the right to make space.
2. Insert the new value at the desired position.

Example:

For the array [10, 20, 30, 40], to insert 25 at position 2:

- Before: [10, 20, 30, 40]
- After: [10, 20, 25, 30, 40]

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```
c Copy code

#include <stdio.h>

int main() {
    int arr[10] = {10, 20, 30, 40, 50};
    int n = 5, i, pos, value;

    printf("Enter the position to insert (1-6): ");
    scanf("%d", &pos);
    printf("Enter the value to insert: ");
    scanf("%d", &value);

    if (pos < 1 || pos > n + 1) {
        printf("Invalid position!\n");
    } else {
        for (i = n - 1; i >= pos - 1; i--) {
            arr[i + 1] = arr[i]; // Corrected shift logic
        }
        arr[pos - 1] = value; // Insert value
        n++;

        printf("Array after insertion: ");
        for (i = 0; i < n; i++) {
            printf("%d ", arr[i]);
        }
        printf("\n");
    }

    return 0;
}
```

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### Deletion in an Array

Deletion removes an element from the array.

Steps:

1. Identify the position of the element to delete.
2. Shift elements to the left to fill the gap.
3. Adjust the size of the array.

Example:

For the array [10, 20, 30, 40], deleting the element 20:

- Before: [10, 20, 30, 40]
- After: [10, 30, 40]



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```
c Copy code
#include <stdio.h>

int main() {
    int arr[10] = {10, 20, 30, 40, 50};
    int n = 5, i, pos;

    printf("Enter the position to delete (1-5): ");
    scanf("%d", &pos);

    if (pos < 1 || pos > n) {
        printf("Invalid position!\n");
    } else {
        for (i = pos - 1; i < n - 1; i++) {
            arr[i] = arr[i + 1];
        }
        n--;

        printf("Array after deletion: ");
        for (i = 0; i < n; i++) {
            printf("%d ", arr[i]);
        }
        printf("\n");
    }

    return 0;
}
```

