Wednesday, February 5, 2025

DATA STRUCTURE

EXPERIMENT NO. 1

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24/SCA/BCA/087

SUBMITTED TO- MISS STUTI TANDON

Q1. WRITE A PROGRAM IN C TO IMPLEMENT INSERTION IN 1-D ARRAYS.

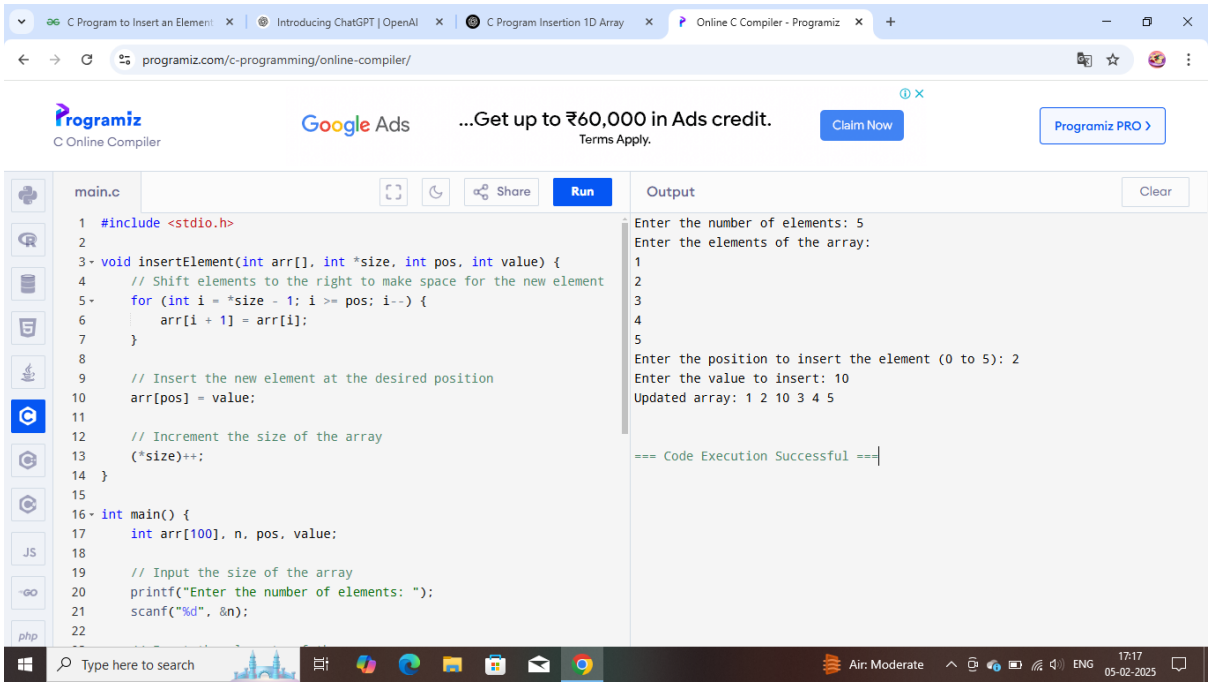
SOL-#include <stdio.h>

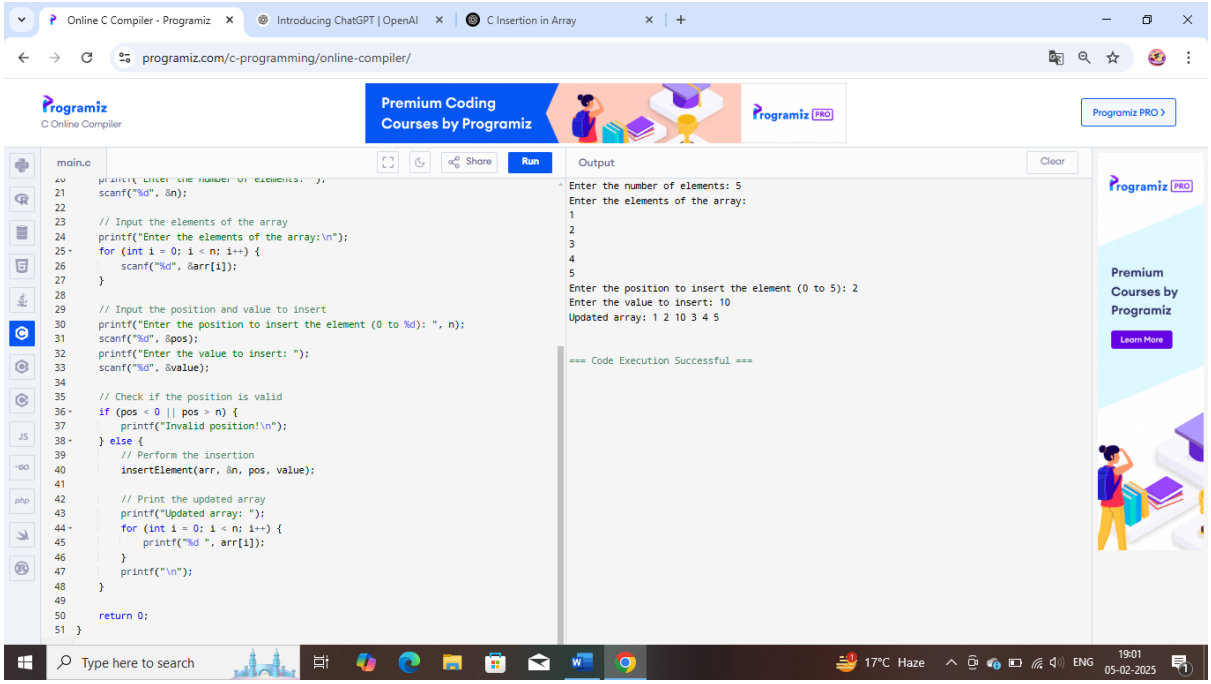
```
void insertElement(int arr[], int *size, int pos, int value) {
   // Shift elements to the right to make space for the new element
   for (int i = *size - 1; i >= pos; i--) {
    arr[i + 1] = arr[i];
```

```
    }

    // Insert the new element at the desired position
    arr[pos] = value;

    // Increment the size of the array
    (*size)++;
}

int main() {
    int arr[100], n, pos, value;

    // Input the size of the array
    printf("Enter the number of elements: ");
    scanf("%d", &n);

    // Input the elements of the array
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
```

```
    }

    // Input the position and value to insert
    printf("Enter the position to insert the element (0 to %d): ", n);
    scanf("%d", &pos);
    printf("Enter the value to insert: ");
    scanf("%d", &value);

    // Check if the position is valid
    if (pos < 0 || pos > n) {
        printf("Invalid position!\n");
    } else {
        // Perform the insertion
        insertElement(arr, &n, pos, value);

        // Print the updated array
        printf("Updated array: ");
        for (int i = 0; i < n; i++) {
            printf("%d ", arr[i]);
```

```
        }
        printf("\n");
    }

    return 0;
}
```





Q2. WRITE A PROGRAM IN C TO IMPLEMENT DELETION IN 1-D ARRAYS.

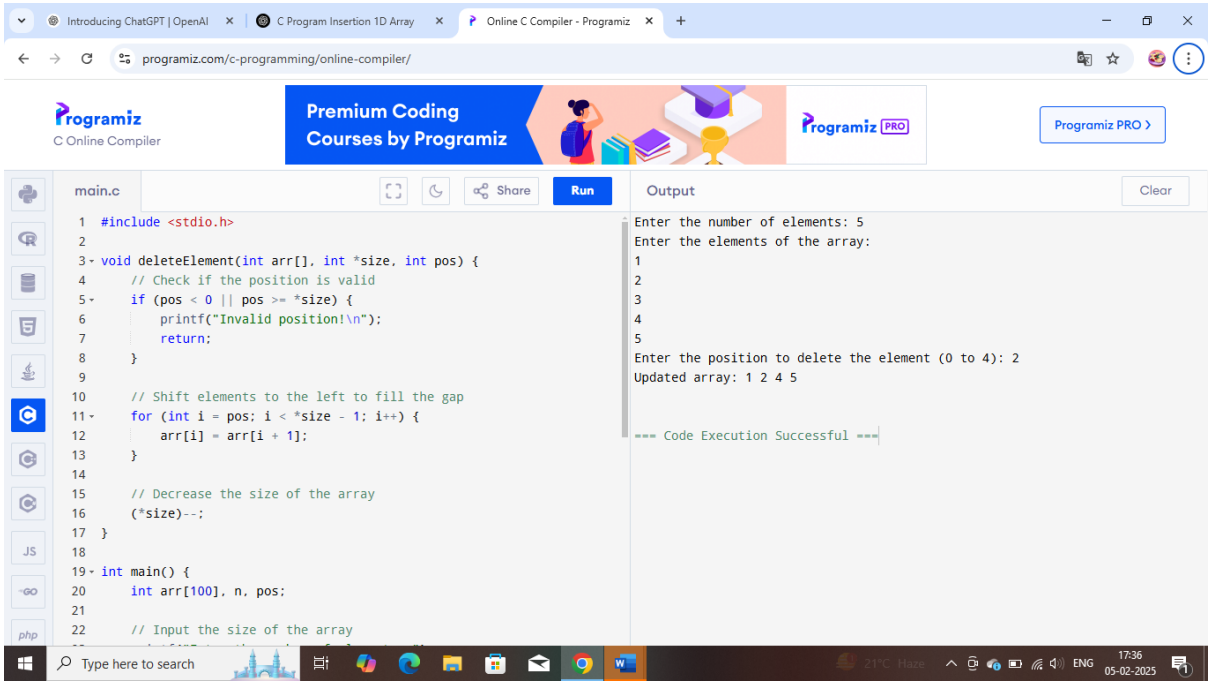
SOL- #include <stdio.h >

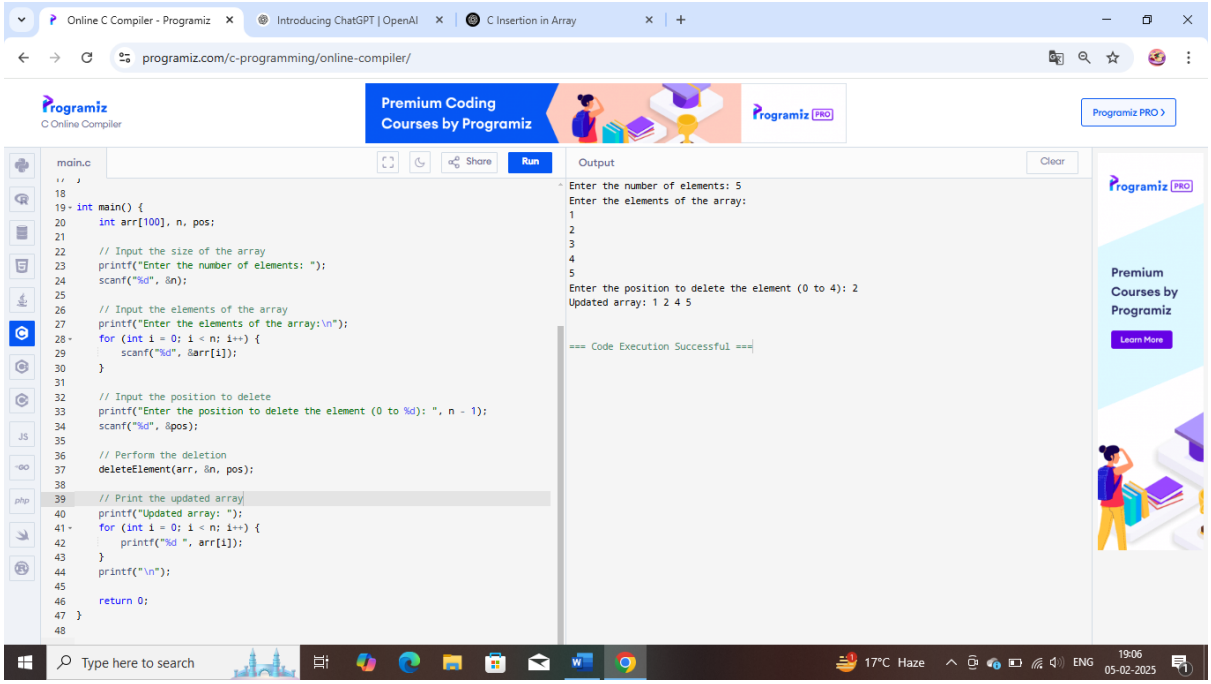
```
void deleteElement(int arr[], int *size, int pos) {
    // Check if the position is valid
```

```
    if (pos < 0 || pos >= *size) {
        printf("Invalid position!\n");
        return;
    }

    // Shift elements to the left to fill the gap
    for (int i = pos; i < *size - 1; i++) {
        arr[i] = arr[i + 1];
    }

    // Decrease the size of the array
    (*size)--;
}

int main() {
    int arr[100], n, pos;

    // Input the size of the array
    printf("Enter the number of elements: ");
    scanf("%d", &n);
```

```
    // Input the elements of the array
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    // Input the position to delete
    printf("Enter the position to delete the element (0
to %d): ", n - 1);
    scanf("%d", &pos);

    // Perform the deletion
    deleteElement(arr, &n, pos);

    // Print the updated array
    printf("Updated array: ");
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
```

```
    printf("\n");


    return 0;

}
```





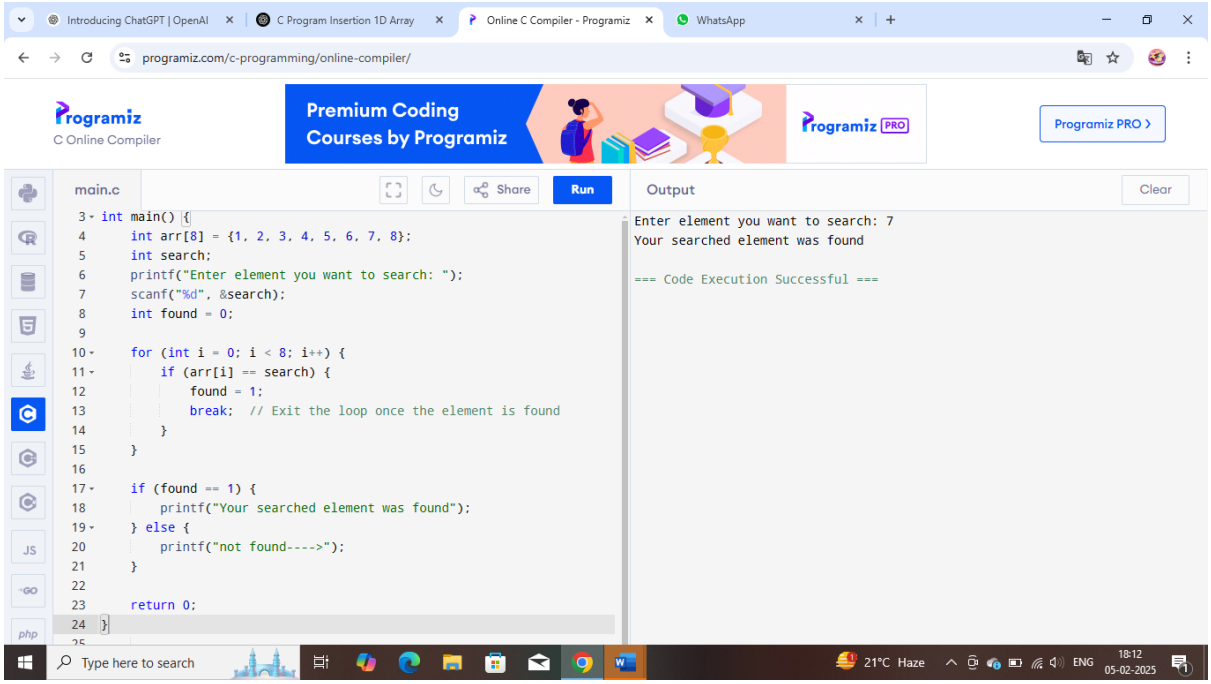
Q3. WRITE A PROGRAM IN C TO IMPLEMENT LINEAR SEARCHING IN 1-D ARRAYS.

SOL-

```
#include <stdio.h>


int main() {
    int arr[8] = {1, 2, 3, 4, 5, 6, 7, 8};
```

```
int search;
printf("Enter element you want to search: ");
scanf("%d", &search);
int found = 0;


for (int i = 0; i < 8; i++) {
    if (arr[i] == search) {
        found = 1;
        break;  // Exit the loop once the element is
found
    }
}


 if (found == 1) {
    printf("Your searched element was found");
} else {
    printf("not found---->");
}

return 0;
```

}



Q4. WRITE A PROGRAM TO IMPLEMENT SORTING IN 1-D ARRAYS.

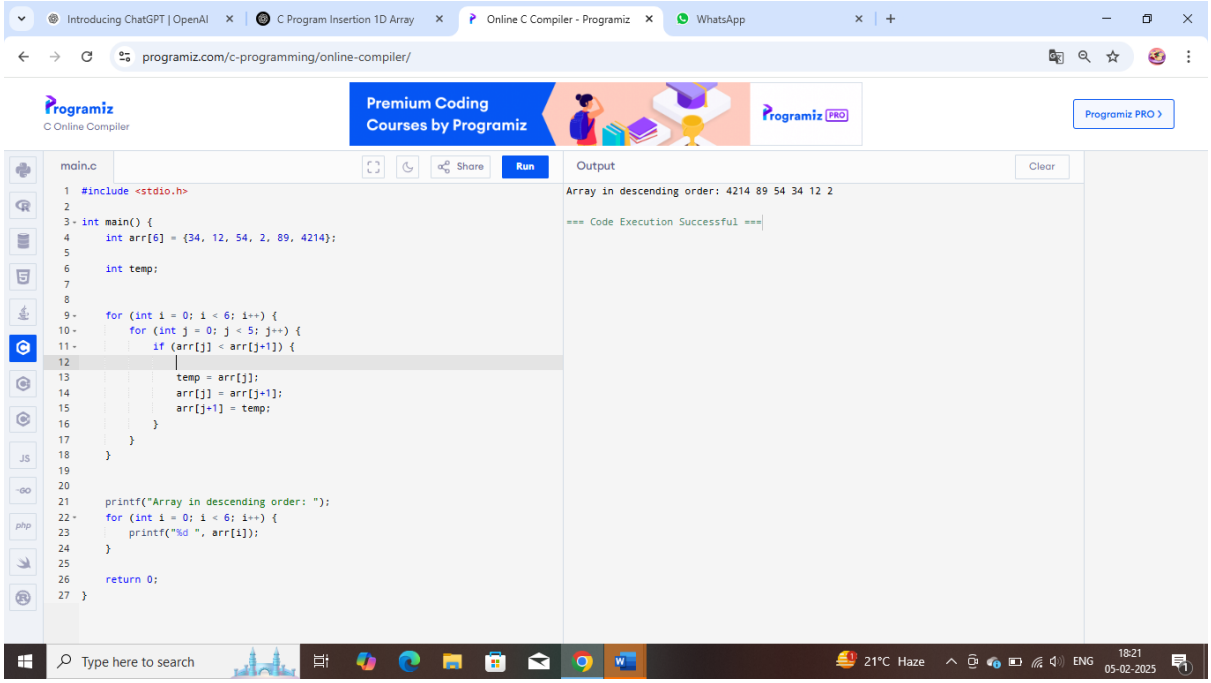
SOL- #include <stdio.h>

int main() {

int arr[6] = {34, 12, 54, 2, 89, 4214};

```
 int temp;



for (int i = 0; i < 6; i++) {
   for (int j = 0; j < 5; j++) {
      if (arr[j] < arr[j+1]) {

         temp = arr[j];
         arr[j] = arr[j+1];
         arr[j+1] = temp;
      }
   }
}



 printf("Array in descending order: ");
for (int i = 0; i < 6; i++) {
   printf("%d ", arr[i]);
}
```

```
    return 0;
}
```



Q5. WRITE A PROGRAM IN C TO IMPLEMENT UPDATION IN 1-D ARRAYS.

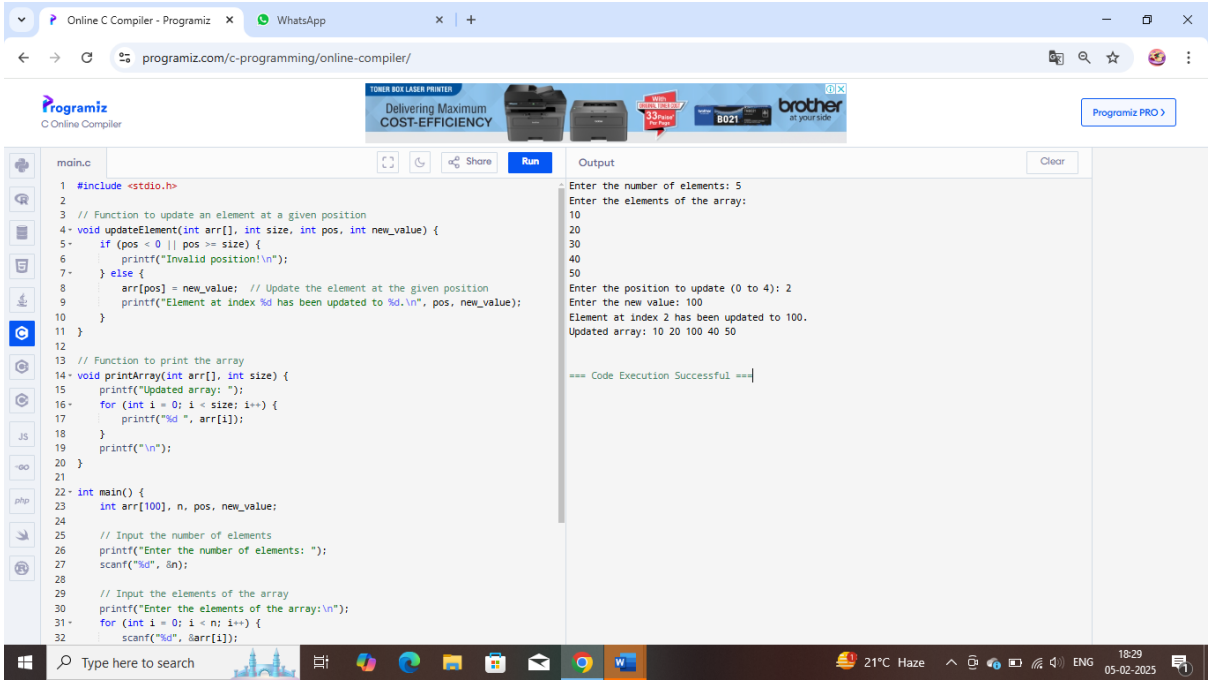
SOL- #include <stdio.h>

// Function to update an element at a given position

```
void updateElement(int arr[], int size, int pos, int
new_value) {
   if (pos < 0 || pos >= size) {
      printf("Invalid position!\n");
   } else {
      arr[pos] = new_value;  // Update the element at
the given position
      printf("Element at index %d has been updated to
%d.\n", pos, new_value);
   }
}

// Function to print the array
void printArray(int arr[], int size) {
   printf("Updated array: ");
   for (int i = 0; i < size; i++) {
      printf("%d ", arr[i]);
   }
   printf("\n");
}
```

```
int main() {
    int arr[100], n, pos, new_value;

    // Input the number of elements
    printf("Enter the number of elements: ");
    scanf("%d", &n);

    // Input the elements of the array
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    // Ask for the position and new value to update
    printf("Enter the position to update (0 to %d): ", n -
1);
    scanf("%d", &pos);
    printf("Enter the new value: ");
    scanf("%d", &new_value);
```

```
    // Update the element at the specified position
    updateElement(arr, n, pos, new_value);

    // Print the updated array
    printArray(arr, n);

    return 0;
}
```



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main.c

```c
    printf("\n");
}

int main() {
    int arr[100], n, pos, new_value;

    // Input the number of elements
    printf("Enter the number of elements: ");
    scanf("%d", &n);

    // Input the elements of the array
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    // Ask for the position and new value to update
    printf("Enter the position to update (0 to %d): ", n - 1);
    scanf("%d", &pos);
    printf("Enter the new value: ");
    scanf("%d", &new_value);

    // Update the element at the specified position
    updateElement(arr, n, pos, new_value);

    // Print the updated array
    printArray(arr, n);

    return 0;
}
```

Share Run

Output Clear

```
Enter the number of elements: 5
Enter the elements of the array:
10
20
30
40
50
Enter the position to update (0 to 4): 2
Enter the new value: 100
Element at index 2 has been updated to 100.
Updated array: 10 20 100 40 50


=== Code Execution Successful ===
```

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