



NUST

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Task no:

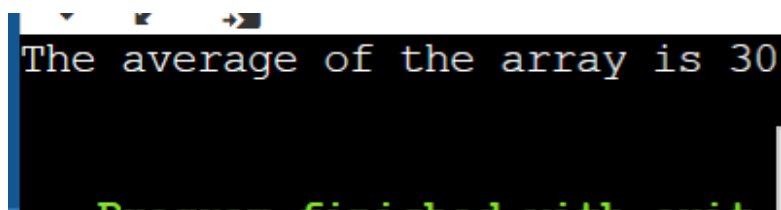
```
#include <iostream>

using namespace std;

double average(int arr[], int n) {
    int sum = 0;
    for (int i = 0; i < n; i++) {
        sum += arr[i];
    }
    return (double)sum / n;
}

int main() {
    int numbers[5] = {10, 20, 30, 40, 50};
    double avg = average(numbers, 5);
    cout << "The average of the array is " << avg << endl;
    return 0;
}
```

OUTPUT:

A screenshot of a terminal window with a black background. The text "The average of the array is 30" is displayed in a light blue/cyan monospaced font. Below this, the text "Program finished with exit" is visible in a green monospaced font. The terminal window has a blue title bar at the top with some icons.

Task no:2

```
#include <iostream>

using namespace std;
```

```
// A function to swap two elements
```

```
void swap(int *a, int *b)
```

```
{
```

```
    int temp = *a;
```

```
    *a = *b;
```

```
    *b = temp;
```

```
}
```

```
// A function to implement bubble sort
```

```
void bubbleSort(int arr[], int n)
```

```
{
```

```
    // Loop through all elements
```

```
    for (int i = 0; i < n - 1; i++)
```

```
    {
```

```
        // Loop through the remaining unsorted elements
```

```
        for (int j = 0; j < n - i - 1; j++)
```

```
        {
```

```
            // If the current element is greater than the next element, swap them
```

```
            if (arr[j] > arr[j + 1])
```

```
            {
```

```
                swap(&arr[j], &arr[j + 1]);
```

```
            }
```

```
        }
```

```
    }
```

```
}
```

```
// A function to print an array
```

```
void printArray(int arr[], int n)
```

```
{
```

```
    for (int i = 0; i < n; i++)
```

```
    {
```

```
        cout << arr[i] << " ";
```

```
    }
```

```
    cout << endl;
```

```
}
```

```
// The main function
```

```
int main()
```

```
{
```

```
    // Declare an array of 5 integers
```

```
    int arr[5];
```

```
    // Take input from the user
```

```
    cout << "Enter 5 integers: " << endl;
```

```
    for (int i = 0; i < 5; i++)
```

```
    {
```

```
        cin >> arr[i];
```

```
    }
```

```
    // Print the original array
```

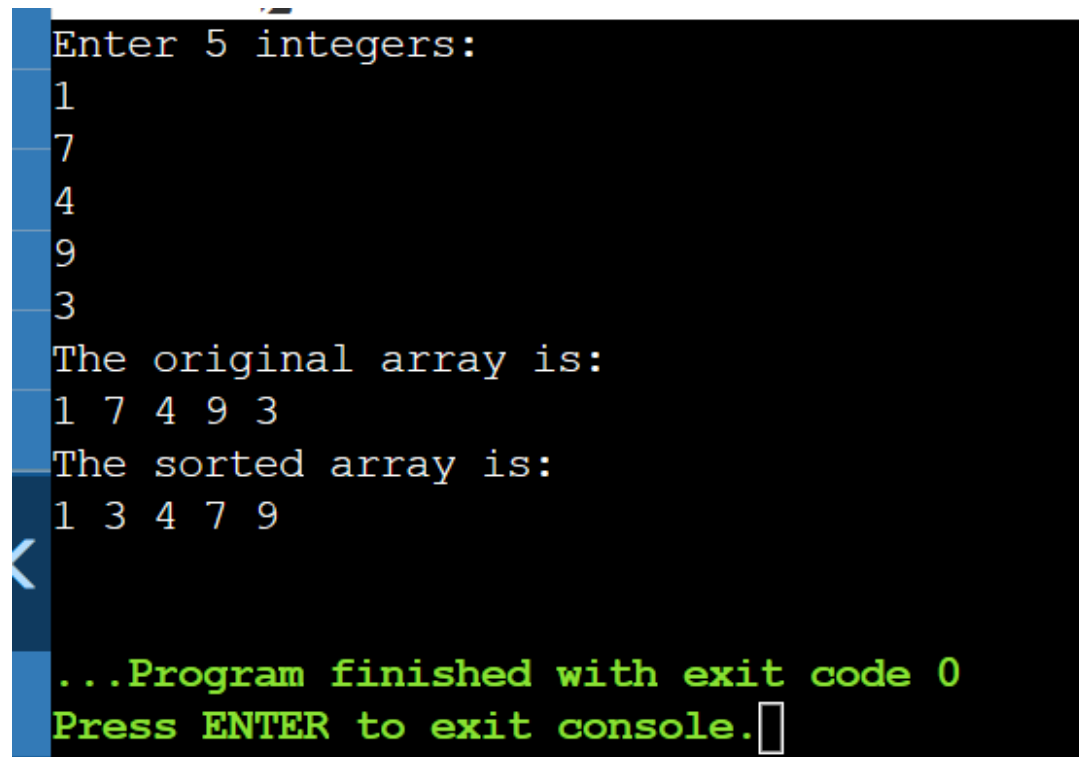
```
    cout << "The original array is: " << endl;
```

```
    printArray(arr, 5);
```

```
// Sort the array using bubble sort
bubbleSort(arr, 5);

// Print the sorted array
cout << "The sorted array is: " << endl;
printArray(arr, 5);

return 0;
}
```

A screenshot of a terminal window with a black background and white text. The text shows the execution of a C++ program. It starts with a prompt "Enter 5 integers:" followed by the input "1 7 4 9 3". Then it displays "The original array is:" followed by "1 7 4 9 3". Next, it shows "The sorted array is:" followed by "1 3 4 7 9". At the bottom, there is a green message: "...Program finished with exit code 0" and "Press ENTER to exit console." with a cursor. A blue vertical bar is on the left side of the terminal window.

```
Enter 5 integers:
1
7
4
9
3
The original array is:
1 7 4 9 3
The sorted array is:
1 3 4 7 9
...Program finished with exit code 0
Press ENTER to exit console.
```

Task no :3

```
#include <iostream>
```

```
using namespace std;
```

```
// A function to swap two elements
```

```
void swap(int *a, int *b) {
```

```
    int temp = *a;
```

```
    *a = *b;
```

```
    *b = temp;
```

```
}
```

```
// A function to perform selection sort on an array
```

```
void selectionSort(int arr[], int n) {
```

```
    // Loop through the array from 0 to n-1
```

```
    for (int i = 0; i < n-1; i++) {
```

```
        // Find the minimum element in the unsorted part of the array
```

```
        int min_index = i;
```

```
        for (int j = i+1; j < n; j++) {
```

```
            if (arr[j] < arr[min_index]) {
```

```
                min_index = j;
```

```
            }
```

```
        }
```

```
        // Swap the minimum element with the first element of the unsorted part
```

```
        swap(&arr[min_index], &arr[i]);
```

```
    }
```

```
}
```

```
// A function to print an array
```

```
void printArray(int arr[], int n) {
```

```
    for (int i = 0; i < n; i++) {
```

```
        cout << arr[i] << " ";
```

```
}
```

```
cout << endl;
```

```
}
```

```
// The main function
```

```
int main() {
```

```
    int arr[5];
```

```
    cout << "Enter 5 integers: " << endl;
```

```
    for (int i = 0; i < 5; i++) {
```

```
        cin >> arr[i];
```

```
    }
```

```
    cout << "The original array is: " << endl;
```

```
    printArray(arr, 5);
```

```
    cout << "The sorted array is: " << endl;
```

```
    printArray(arr, 5);
```

```
    return 0;
```

```
}
```

```
Enter 5 integers:
9
5
347
45
6
The original array is:
9 5 347 45 6
The sorted array is:
5 6 9 45 347
```