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DAA.cpp

```cpp
#include <bits/stdc++.h>
using namespace std;
int main()
{
  int arr[5], num;
  cout << "Enter elements to store in array : ";

  for (int i = 0; i < 5; i++)
  {
    cin >> arr[i];
  }

  cout << "Enter an element to be found in array : ";
  cin >> num;

  int temp = -1;
  for (int j = 0; j < 5; j++)
  {
    if (arr[j] == num)
    {
      cout << "The element is found at the position " << j;
      temp = 0;
    }
  }
  if (temp == -1)
  {
    cout << "No element found please try again !";
  }
}
```

```
Enter elements to store in array : 5
4
2
3
1
Enter an element to be found in array : 4
The element is found at the position 1
--------------------------------
Process exited after 26.94 seconds with return value 0
Press any key to continue . . .
```

```cpp
// 2.Binary Search
#include <bits/stdc++.h>
using namespace std;
int binarySearch(int a[], int left, int right, int x)
{
  while (left <= right)
  {
    int mid = left + (right - left) / 2;
    if (a[mid] == x)
    {
      return mid;
    }
    else if (a[mid] < x) // 0 1 2 3 4 5 6 7 8 9
    {
      left = mid + 1;
    }
    else
    {
      right = mid - 1;
    }
  }
  return -1;
}

int main()
{
  int arraySize, a, num;
  int arr[7];
  int output;
```

```
30
31      cout << "Enter elments to store in array in ascending order -> ";
32      for (int i = 0; i < 7; i++)
33      {
34        cin >> arr[i];
35      }
36
37      cout << "Enter an element for binary search -> ";
38      cin >> num;
39
40      output = binarySearch(arr, 0, 6, num);
41
42      if (output == -1)
43      {
44        cout << "No element found !";
45      }
46      else
47      {
48        cout << "The element found at the position " << output;
49      }
50  }
51
52
```

```
Enter elements to store in array : 5
3
6
2
7
Enter an element to be found in array : 7
The element is found at the position 4
--------------------------------
Process exited after 11.67 seconds with return value 0
Press any key to continue . . .
```

```cpp
// 3.Jump Search

#include <bits/stdc++.h>
using namespace std;

int jumpSearch(int arr[], int x, int n)
{
    int step = sqrt(n);
    int prev = 0;
    while (arr[min(step, n)-1] < x)
    {
        prev = step;
        step += sqrt(n);
        if (prev >= n)
            return -1;
    }

    while (arr[prev] < x)
    {
        prev++;
        if (prev == min(step, n))
            return -1;
    }
    if (arr[prev] == x)
        return prev;

    return -1;
}

```

```
30  int main()
31  {
32      int arr[] = {1,3,5,7,9,2,4,14,8,10};
33      int x = 22;
34
35      int n = sizeof(arr) / sizeof(arr[0]);
36          int index = jumpSearch(arr, x, n);
37
38      cout << "Number " << x;
39      cout << " is at index " << index;
40      return 0;
41  }
42
```

```
Number 22 is at index -1
--------------------------------
Process exited after 0.08293 seconds with return value 0
Press any key to continue . . .
```

```cpp
// 1. Insertion Sort

#include <bits/stdc++.h>
using namespace std;
void insertionSort(int arr[])
{
    int j = 0;
    int key = 0;
    for (int i = 1; i < 5; i++) // 1 3 4 2
    {
        j = i - 1;
        key = arr[i];
        while (j >= 0 && arr[j] > key)
        {
            arr[j + 1] = arr[j];
            j = j - 1;
        }
        arr[j + 1] = key;
    }
}

int main()
{
    int myArray[5];

    cout << "Enter the elements in Random order : ";
    for (int i = 0; i < 5; i++)
    {
        cin >> myArray[i];
    }

```

```
32      cout << "BEFORE SORTING : ";
33      for (int i = 0; i < 5; i++)
34      {
35          cout << myArray[i] << "  ";
36      }
37      cout << endl;
38
39      insertionSort(myArray);
40
41      cout << "AFTER SORTING  : ";
42      for (int i = 0; i < 5; i++)
43      {
44          cout << myArray[i] << "  ";
45      }
46  }
47
```

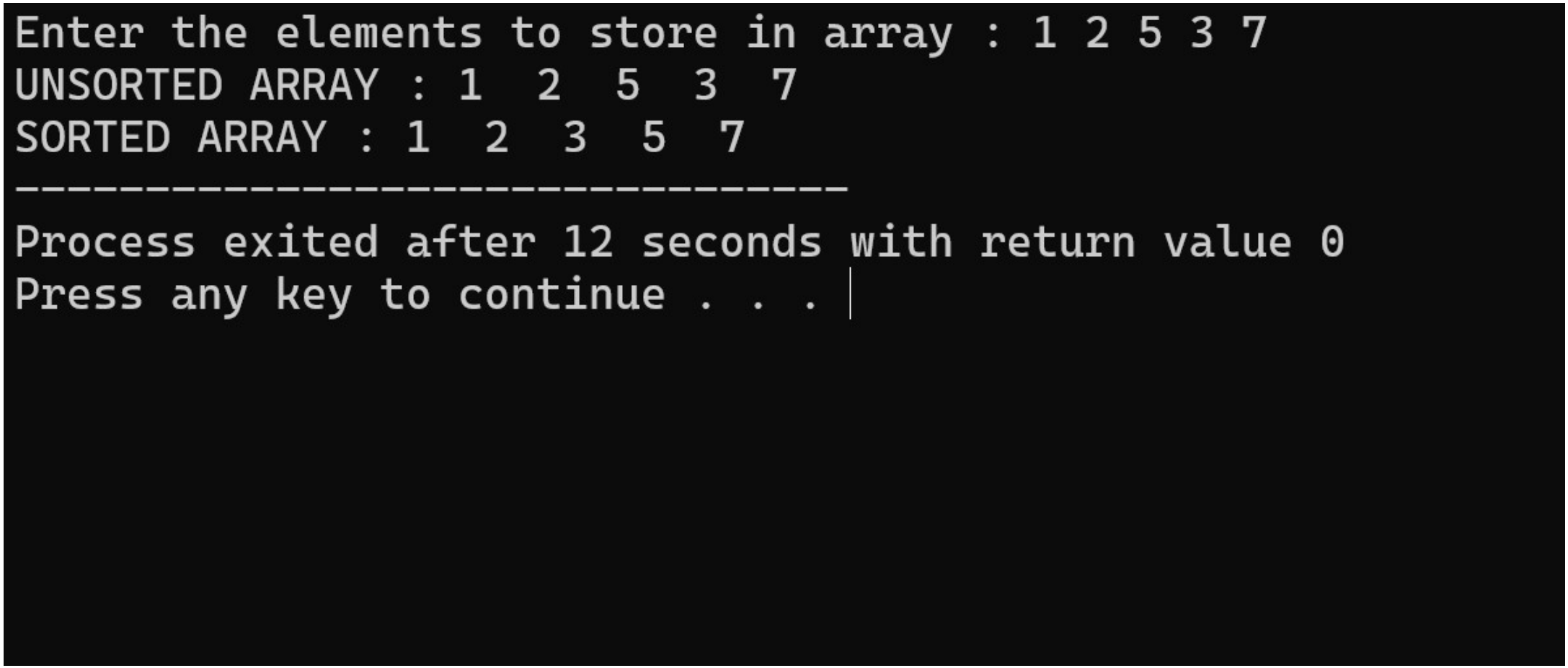
```
Enter the elements in Random order : 2 4 1 5 7
BEFORE SORTING : 2  4  1  5  7
AFTER SORTING  : 1  2  4  5  7
--------------------------------
Process exited after 5.114 seconds with return value 0
Press any key to continue . . .
```

```cpp
// 2. Selection Sort

#include <bits/stdc++.h>
using namespace std;
void selectionSort(int arr[])
{
  for (int i = 0; i < 4; i++)
  {
    int min = i;
    for (int j = i + 1; j < 5; j++)
    {
      if (arr[min] > arr[j])
      {
        min = j;
      }
    }
    if (min != i)
    {
      int temp = arr[min];
      arr[min] = arr[i];
      arr[i] = temp;
    }
  }
}
int main()
{
  int arr[5];

  cout << "Enter the elements to store in array : ";
```

```
30    for (int i = 0; i < 5; i++)
31    {
32      cin >> arr[i];
33    }
34
35    cout << "UNSORTED ARRAY : ";
36    for (int i = 0; i < 5; i++)
37    {
38      cout << arr[i] << "  ";
39    }
40    cout << endl;
41
42    selectionSort(arr);
43
44    cout << "SORTED ARRAY : ";
45    for (int i = 0; i < 5; i++)
46    {
47      cout << arr[i] << "  ";
48    }
49  }
50
51
52
```


Enter the elements to store in array : 1 2 5 3 7
UNSORTED ARRAY : 1 2 5 3 7
SORTED ARRAY : 1 2 3 5 7

Process exited after 12 seconds with return value 0
Press any key to continue . . .

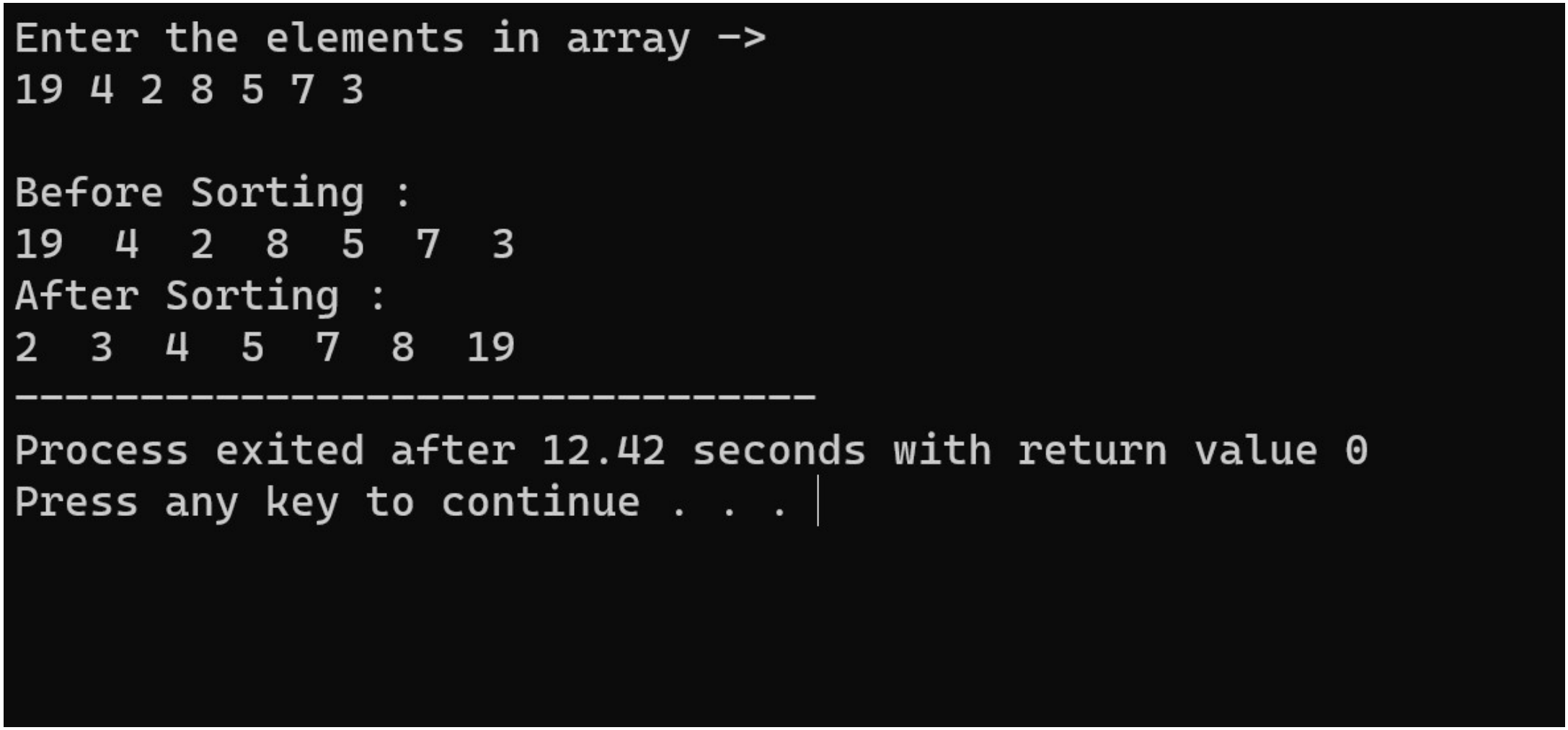
```cpp
// 3. Bubble Sort
#include <bits/stdc++.h>
using namespace std;
void selectionSort(int a[])
{
  for (int i = 0; i < 7; i++)
  {
    for (int j = i + 1; j < 7; j++)
    {
      if (a[i] > a[j])
      {
        int temp = a[j];
        a[j] = a[i];
        a[i] = temp;
      }
    }
  }
}

int main()
{
  int arr[7];

  cout << "Enter the elements in array -> " << endl;
  for (int i = 0; i < 7; i++)
  {
    cin >> arr[i];
  }
  cout << endl;

```

```
31      cout << "Before Sorting : " << endl;
32      for (int i = 0; i < 7; i++)
33      {
34        cout << arr[i] << "  ";
35      }
36      cout << endl;
37
38      selectionSort(arr);
39
40      cout << "After Sorting : " << endl;
41      for (int i = 0; i < 7; i++)
42      {
43        cout << arr[i] << "  ";
44      }
45  }
46
47
```


Enter the elements in array ->
19 4 2 8 5 7 3
Before Sorting :
19 4 2 8 5 7 3
After Sorting :
2 3 4 5 7 8 19

Process exited after 12.42 seconds with return value 0
Press any key to continue . . .


THANK
YOU!