

## Bubble sort in C++

```
#include <iostream>
using namespace std;

void BubbleSort(int arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - 1 - i; j++) {
            if (arr[j] > arr[j + 1]) {
                // Swap arr[j] and arr[j+1]
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

int main() {
    int arr[] = {0, 1, 5, 7, 8, 9, 4};
    int n = sizeof(arr) / sizeof(arr[0]);

    BubbleSort(arr, n);

    cout << "Sorted array: ";
    for (int i = 0; i < n; i++) {
        cout << arr[i] << " ";
    }
    cout << endl;

    return 0;
}
```

### Dry Run Table:

#### Initial:

[0, 1, 5, 7, 8, 9, 4]

#### Pass 1 (i = 0):

Compare arr[j]	Swap?	Result
0 and 1	No	[0, 1, 5, 7, 8, 9, 4]
1 and 5	No	[0, 1, 5, 7, 8, 9, 4]
5 and 7	No	[0, 1, 5, 7, 8, 9, 4]
7 and 8	No	[0, 1, 5, 7, 8, 9, 4]
8 and 9	No	[0, 1, 5, 7, 8, 9, 4]
9 and 4	<b>Yes</b>	[0, 1, 5, 7, 8, 4, 9]

✓ Largest element 9 moved to the end.

#### Pass 2 (i = 1):

Compare arr[j]	Swap?	Result
0 and 1	No	[0, 1, 5, 7, 8, 4, 9]
1 and 5	No	[0, 1, 5, 7, 8, 4, 9]
5 and 7	No	[0, 1, 5, 7, 8, 4, 9]
7 and 8	No	[0, 1, 5, 7, 8, 4, 9]
8 and 4	<b>Yes</b>	[0, 1, 5, 7, 4, 8, 9]

✓ Second-largest 8 in place.

#### Pass 3 (i = 2):

Compare arr[j]	Swap?	Result
0 and 1	No	[0, 1, 5, 7, 4, 8, 9]
1 and 5	No	[0, 1, 5, 7, 4, 8, 9]
5 and 7	No	[0, 1, 5, 7, 4, 8, 9]
7 and 4	<b>Yes</b>	[0, 1, 5, 4, 7, 8, 9]

#### Pass 4 (i = 3):

Compare arr[j]	Swap?	Result
0 and 1	No	[0, 1, 5, 4, 7, 8, 9]
1 and 5	No	[0, 1, 5, 4, 7, 8, 9]
5 and 4	<b>Yes</b>	[0, 1, 4, 5, 7, 8, 9]

#### Pass 5 (i = 4):

Compare arr[j]	Swap?	Result
0 and 1	No	[0, 1, 4, 5, 7, 8, 9]

	<table><tr><th>Compare arr[j]</th><th>Swap?</th><th>Result</th></tr><tr><td>1 and 4</td><td>No</td><td>[0, 1, 4, 5, 7, 8, 9]</td></tr></table>	Compare arr[j]	Swap?	Result	1 and 4	No	[0, 1, 4, 5, 7, 8, 9]
	Compare arr[j]	Swap?	Result				
	1 and 4	No	[0, 1, 4, 5, 7, 8, 9]				
	<p>Pass 6 (i = 5):</p>						
	<table><tr><th>Compare arr[j]</th><th>Swap?</th><th>Result</th></tr><tr><td>0 and 1</td><td>No</td><td>[0, 1, 4, 5, 7, 8, 9]</td></tr></table>	Compare arr[j]	Swap?	Result	0 and 1	No	[0, 1, 4, 5, 7, 8, 9]
	Compare arr[j]	Swap?	Result				
	0 and 1	No	[0, 1, 4, 5, 7, 8, 9]				
	<p>🚩 Final Sorted Array:</p>						
	<p>Sorted array: 0 1 4 5 7 8 9</p>						
Sorted array: 0 1 4 5 7 8 9							