## **DSA LAB 12:**

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GitHub:

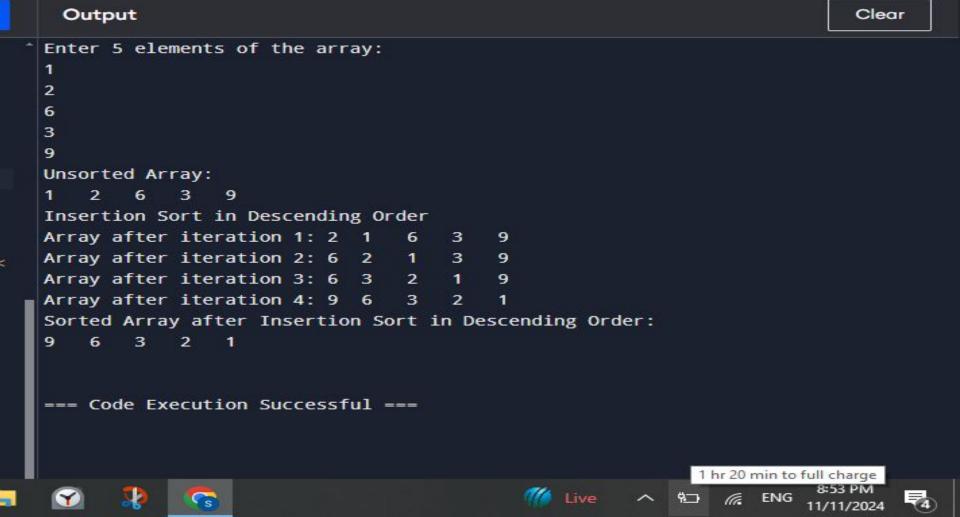
https://github.com/saif01234567/Lab-Tasks-DS

```
#include<iostream>
using namespace std;
int main() {
  int n = 5;
  int a[n];
  // Take input for the array
  cout << "Enter 5 elements of the array: " << endl;
  for (int i = 0; i < n; i++) {
     cin >> a[i];
```

TASK#1:

```
cout << "Unsorted Array: " << endl;
  for (int k = 0; k < n; k++) {
     cout << a[k] << "\t";
  cout << endl;
  cout << "Insertion Sort in Descending Order" << endl;
  // Insertion Sort in descending order
  for (int i = 1; i < n; i++) {
     int temp = a[i];
     int i = i - 1;
     while (i >= 0 && a[i] < temp) { // Change condition for descending order
       a[j + 1] = a[i]:
        j--;
     a[i + 1] = temp;
```

```
// Display array after each iteration
     cout << "Array after iteration " << i << ": ";</pre>
     for (int k = 0; k < n; k++) {
        cout << a[k] << "\t";
     cout << endl;
  cout << "Sorted Array after Insertion Sort in Descending Order: " << endl;
  for (int k = 0; k < n; k++) {
     cout << a[k] << "\t";
   cout << endl:
  return 0;
```



```
TASK#2:
#include<iostream>
using namespace std;
int main() {
  int n = 9;
  int a[n];
  // Take input for the array
  cout << "Enter 9 elements of the array: " << endl;
  for (int i = 0; i < n; i++) {
     cin >> a[i];
```

```
cout << "Unsorted Array:" << endl;
  for (int k = 0; k < n; k++) {
     cout << a[k] << " ";
  cout << endl;
  cout << "Bubble Sort" << endl;
  int temp;
  bool swapped;
```

```
// Bubble Sort with early exit if the array is sorted
  for (int i = 0; i < n - 1; i++) {
     swapped = false; // Reset the flag for each pass
     for (int i = 0; i < n - i - 1; i++) {
        if (a[j] > a[j + 1]) {
           // Swap elements if they are in the wrong order
           temp = a[i];
           a[i] = a[i + 1];
           a[j + 1] = temp;
           swapped = true; // Set the flag to true if a swap occurred
// If no elements were swapped, the array is already sorted
     if (!swapped) {
        break;
```

```
// Display the array after each pass
  cout << "Array after pass " << i + 1 << ": ";
  for (int k = 0; k < n; k++) {
     cout << a[k] << " ";
  cout << endl;
cout << "Sorted Array after Bubble Sort is: " << endl;
for (int k = 0; k < n; k++) {
  cout << a[k] << " ";
cout << endl:
return 0;
```

