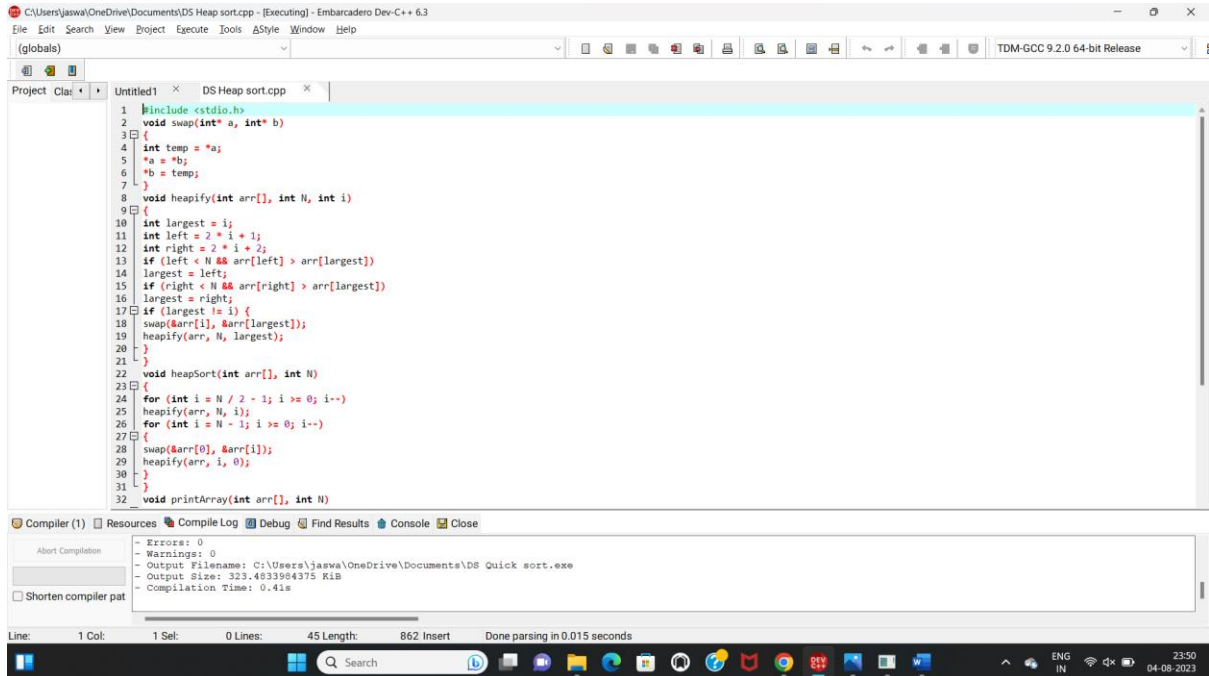
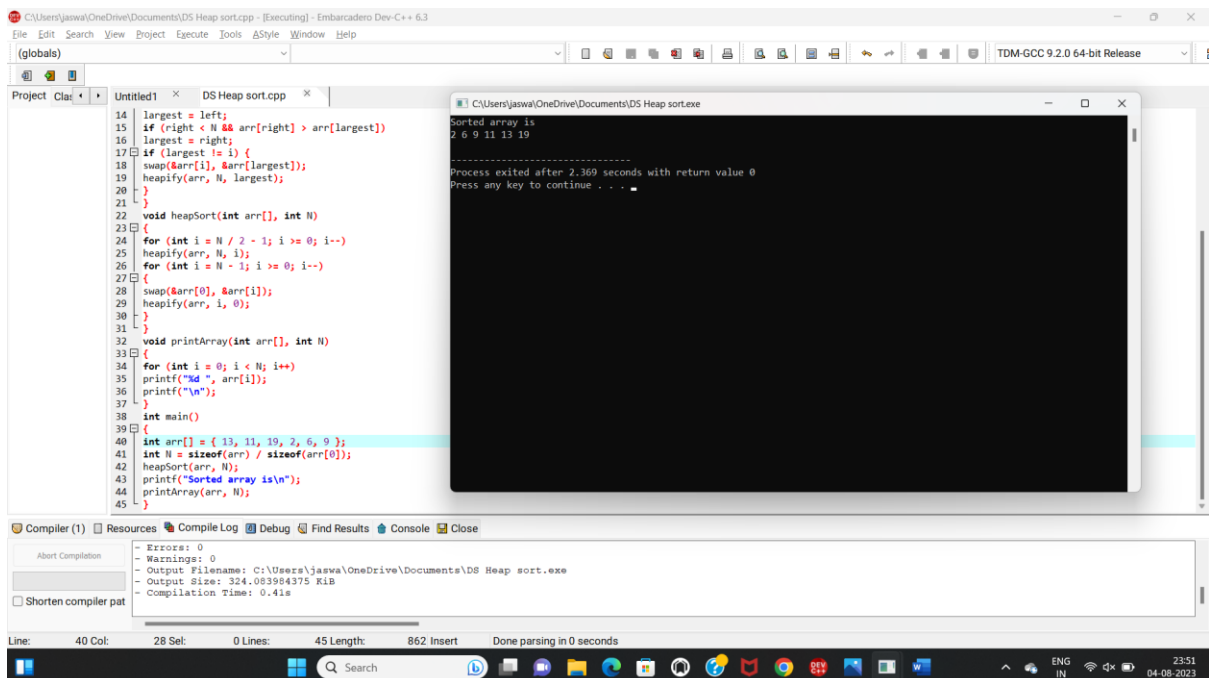


DS HEAP SORT



```
1 #include <stdio.h>
2 void swap(int* a, int* b)
3 {
4     int temp = *a;
5     *a = *b;
6     *b = temp;
7 }
8 void heapify(int arr[], int N, int i)
9 {
10     int largest = i;
11     int left = 2 * i + 1;
12     int right = 2 * i + 2;
13     if (left < N && arr[left] > arr[largest])
14         largest = left;
15     if (right < N && arr[right] > arr[largest])
16         largest = right;
17     if (largest != i) {
18         swap(&arr[i], &arr[largest]);
19         heapify(arr, N, largest);
20     }
21 }
22 void heapSort(int arr[], int N)
23 {
24     for (int i = N / 2 - 1; i >= 0; i--)
25         heapify(arr, N, i);
26     for (int i = N - 1; i >= 0; i--)
27     {
28         swap(&arr[0], &arr[i]);
29         heapify(arr, i, 0);
30     }
31 }
32 void printArray(int arr[], int N)
33 {
34     for (int i = 0; i < N; i++)
35         printf("%d ", arr[i]);
36     printf("\n");
37 }
38 int main()
39 {
40     int arr[] = { 13, 11, 19, 2, 6, 9, 3, 1, 4, 5 };
41     int N = sizeof(arr) / sizeof(arr[0]);
42     heapSort(arr, N);
43     printf("Sorted array is\n");
44     printArray(arr, N);
45 }
```



```
14 largest = left;
15 if (right < N && arr[right] > arr[largest])
16     largest = right;
17 if (largest != i) {
18     swap(&arr[i], &arr[largest]);
19     heapify(arr, N, largest);
20 }
21 }
22 void heapSort(int arr[], int N)
23 {
24     for (int i = N / 2 - 1; i >= 0; i--)
25         heapify(arr, N, i);
26     for (int i = N - 1; i >= 0; i--)
27     {
28         swap(&arr[0], &arr[i]);
29         heapify(arr, i, 0);
30     }
31 }
32 void printArray(int arr[], int N)
33 {
34     for (int i = 0; i < N; i++)
35         printf("%d ", arr[i]);
36     printf("\n");
37 }
38 int main()
39 {
40     int arr[] = { 13, 11, 19, 2, 6, 9, 3, 1, 4, 5 };
41     int N = sizeof(arr) / sizeof(arr[0]);
42     heapSort(arr, N);
43     printf("Sorted array is\n");
44     printArray(arr, N);
45 }
```

Sorted array is
2 6 9 11 13 19

Process exited after 2.369 seconds with return value 0
Press any key to continue . . .