

ain.c

```

1  /*****
2
3      Online C Compiler.
4      Code, Compile, Run and Debug C program online.
5      Write your code in this editor and press "Run" button to compile and e
6
7  *****/
8  #include <stdio.h>
9  #include <time.h>
10 int temp;
11
12 void delay()
13 {
14     for (int i=0;i<10000000;i++){
15         //deLay
16     }
17 }
18
19 void heapify(int arr[], int size, int i)
20 {
21     int largest = i;
22     int left = 2 * i + 1;
23     int right = 2 * i + 2;
24
25     if (left < size && arr[left] > arr[largest]){
26         largest = left;
27     }
28     if (right < size && arr[right] > arr[largest]){
29         largest = right;
30     }
31     if (largest != i) {
32         temp = arr[i];
33         arr[i] = arr[largest];
34         arr[largest] = temp;
35         heapify(arr, size, largest);
36     }
37 }
38

```

Press ENTER to exit



```
38
39 void heapSort(int arr[], int size)
40 {
41     int i;
42     for (i = size / 2 - 1; i >= 0; i--){
43         heapify(arr, size, i);
44     }
45     for (i=size-1; i>=0; i--) {
46         temp = arr[0];
47         arr[0] = arr[i];
48         arr[i] = temp;
49         heapify(arr, i, 0);
50     }
51     delay();
52 }
53
54 //display array
55 void display(int arr[],int n)
56 {
57     int i;
58     for(i=0;i<n;i++)
59     {
60         printf("%d ",arr[i]);
61     }
62 }
63
64 int main()
65 {
66     int i, n, arr[2000];
67     int rand(void);
68     clock_t start,end;
69     double timetaken;
70
71     printf("Enter the number of elements :\t");
72     scanf("%d",&n);
73
74     for(i=0;i<n;i++){
75         arr[i]=rand() % 2000 + 1;
```



```
53
54 //display array
55 void display(int arr[],int n)
56 {
57     int i;
58     for(i=0;i<n;i++)
59     {
60         printf("%d ",arr[i]);
61     }
62 }
63
64 int main()
65 {
66     int i, n, arr[2000];
67     int rand(void);
68     clock_t start,end;
69     double timetaken;
70
71     printf("Enter the number of elements :\t");
72     scanf("%d",&n);
73
74     for(i=0;i<n;i++){
75         arr[i]=rand() % 2000 + 1;
76     }
77     printf("\n\nUnsorted Array:\n");
78     display(arr,n);
79
80     start=clock();
81     heapSort(arr, n);
82     end=clock();
83     timetaken=((double)(end-start))/CLOCKS_PER_SEC;
84
85     printf("\n\nArray after Heap Sort:\n");
86     display(arr,n);
87
88     printf("\n\nTime taken for Heap Sort: %lf s",timetaken);
89     return 0;
90 }
```

58  
Enter the number of elements : 5

Unsorted Array:

1384 887 778 916 1794

Array after Heap Sort:

778 887 916 1384 1794

Time taken for Heap Sort: 0.021983 s

...Program finished with exit code 0

Press ENTER to exit console.