```
#include <stdio.h>
    #include <stdlib.h>
    #include <time.h>
 6
    void heap sort(int[],int);
    void heap cons(int[],int);
8
    void heap adj(int[],int);
9
10
11
     int main()
12
13
      int n, i;
      int c,d;
14
15
      srand(time(0));
16
      printf ("Enter the No: of elements:");
17
      scanf ("%d", &n);
18
      int a[n];
19
      for (i=0; i<n; i++)
20
   21
       a[i]=rand()%1000;
22
23
     printf("\nThe Array elements are :\n");
24
      for (i=0; i<n; i++)
25
26
        printf("%d\t",a[i]);
27
28
      heap sort(a,n);
      printf("\nSorted array:\n");
29
30
      for (i=0; i<n; i++)
31
    白 {
      printf("%d\t",a[i]);
32
33
34
      clock t t;
35
         double cpu time;
36
         t=clock();
         for (c = 1; c <= 5000; c++) for (d = 1; d <= 5000; d++) { }
37
38
         + - clock// - +.
```

```
32
      printf("%d\t",a[i]);
33
34
      clock t t;
35
         double cpu time;
36
         t=clock();
37
         for (c = 1; c <= 5000; c++) for (d = 1; d <= 5000; d++) { }
38
         t = clock() - t;
         cpu time=((double)t)/CLOCKS PER SEC;
39
         printf("\nTime taken :%f sec\n", cpu time);
40
         return 0;
41
42
43
     void heap sort(int a[], int n)
44
45
      int i, temp;
46
      heap cons(a,n);
47
      for (i=n-1; i>0; i--)
48
49
50
      temp=a[0];
51
      a[0]=a[i];
52
      a[i]=temp;
53
      heap adj(a,i);
54
55
56
     void heap cons(int a[], int n)
57
58
59
      int i,j,k,item;
60
      for (k=1; k<n; k++)
61
    日
62
      item=a[k];
63
      i=k;
64
      j = (i-1)/2;
      while(i>0 && item>a[j])
65
66
    a[i]=a[j];
67
68
       i=j;
       i-/i_11/2.
```

```
item=a[k];
62
63
      i=k;
      j = (i-1)/2;
64
65
      while(i>0 && item>a[j])
66
67
       a[i]=a[j];
68
       i=j;
69
       j=(i-1)/2;
70
71
      a[i]=item;
72
73
74
75
     void heap_adj(int a[], int n)
76
77
      int i,j,item;
78
      j=0;
79
      item=a[j];
80
      i=2*j+1;
      while (i \le n-1)
81
82
    ₽{
83
      if(i+1<=n-1)
84
85
      if(a[i] < a[i+1])</pre>
86
      i++;
87
     if(item<a[i])</pre>
88
89
    - □ {
90
      a[j]=a[i];
91
      j=i;
92
     i=2*j+1;
93
94
     else
95
     break;
96
97
     a[j]=item;
98
```

Enter the No: of elements :100																		
The Array elements are :																		
301	145	27	1	888	789	130	479	344	447	833	868	405	118	345	764	922	625	256
163	755	463	374	441	989	270	191	121	589	96	564	791	731	443	910	505	776	344
58	735	431	855	284	509	744	808	341	105	42	453	966	240	594	918	42	390	711
941	510	509	792	739	605	53	616	323	274	37	552	254	428	314	678	934	193	678
253	127	884	114	293	90	881	735	636	412	348	96	461	774	132	756	952	743	941
836	18	639	134															
array:																		
18	27	37	42	42	53	58	90	96	96	105	114	118	121	127	130	132	134	145
162	163	191	193	240	253	254	256	270	274	284	293	301	314	323	341	344	344	345
348	374	390	405	412	428	431	441	443	447	453	461	463	479	505	509	509	510	552
564	589	594	605	616	625	636	639	678	678	711	731	735	735	739	743	744	755	756
764	774	776	789	791	792	808	833	836	855	868	881	884	888	910	918	922	934	941
941	952	966	989															
	ray elem 301 163 58 941 253 836 array: 18 162 348 564 764	ray elements are 301 145 163 755 58 735 941 510 253 127 836 18 array: 18 27 162 163 348 374 564 589 764 774	ray elements are : 301 145 27 163 755 463 58 735 431 941 510 509 253 127 884 836 18 639 array: 18 27 37 162 163 191 348 374 390 564 589 594 764 774 776	ray elements are : 301 145 27 1 163 755 463 374 58 735 431 855 941 510 509 792 253 127 884 114 836 18 639 134 array: 18 27 37 42 162 163 191 193 348 374 390 405 564 589 594 605 764 774 776 789	ray elements are : 301 145 27 1 888 163 755 463 374 441 58 735 431 855 284 941 510 509 792 739 253 127 884 114 293 836 18 639 134 array: 18 27 37 42 42 162 163 191 193 240 348 374 390 405 412 564 589 594 605 616 764 774 776 789 791	ray elements are : 301 145 27 1 888 789 163 755 463 374 441 989 58 735 431 855 284 509 941 510 509 792 739 605 253 127 884 114 293 90 836 18 639 134 array: 18 27 37 42 42 53 162 163 191 193 240 253 348 374 390 405 412 428 564 589 594 605 616 625 764 774 776 789 791 792	ray elements are : 301											

- 🗇 X

Time taken :0.053000 sec

C:\WINDOWS\SYSTEM32\cmd.exe

(program exited with code: 0)

Press any key to continue . . .