

24/8/23

Heap Sort

```
#include <stdio.h>
```

```
#include <time.h>
```

```
void heapify (int arr [], int n, int i) {
```

```
    int largest = i;
```

```
    int left = 2 * i + 1;
```

```
    int right = 2 * i + 2;
```

```
    if (left < n && arr[left] > arr[largest])  
        largest = left;
```

```
    if (right < n && arr[right] > arr[largest])  
        largest = right;
```

```
    if (largest != i) {
```

```
        int temp = arr[i];
```

```
        arr[i] = arr[largest];
```

```
        arr[largest] = temp;
```

```
        heapify (arr, n, largest);
```

```
    }
```

```
}
```

```
void heapSort (int arr [], int n) {
```

```
    for (int i = n/2 - 1; i >= 0; i--)
```

```
        heapify (arr, n, i);
```

```
    for (int i = n - 1; i > 0; i--) {
```

```
        int temp = arr[0];
```

```
        arr[0] = arr[i];
```

```
        arr[i] = temp;
```

```
        heapify (arr, i, 0);
```

```
    }
```

```
}
```

```
int main () {
```

```
    int n;
```

```
    printf ("Enter the no. of elements : ");
```

```
    scanf ("%d", &n);
```

```
    int arr[n];
```

```
    printf ("Enter the no of elements : ");
```

```
    scanf ("%d"
```

```
    int arr[n];
```

```
    printf ("Enter %d elements : \n", n);
```

```
    for (int i = 0; i < n; i++)
```

```
        scanf ("%d", &arr[i]);
```

```
    clock_t start-time = clock();
```

```
    heapsort (arr, n)
```

```
    clock_t end-time = clock();
```

```
    printf ("Sorted array : ");
```

```
    for (int i = 0; i < n; i++)
```

```
        printf ("%d", arr[i]);
```

```
    printf ("\n");
```

```
    double time-taken = (double) (end-time -  
        start-time) / clock_per_sec;
```

```
    printf ("Time taken : %f seconds \n",  
        time-taken);
```

```
    return 0;
```


Output

Enter the no of elements: 6

Enter 6 elements.

12

10

13

4

22

1

Sorted array: 1 4 10 12 13 22

Good
20/12/23