

```
/*heap sort*/
```

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

```
void heap_sort(int arr[], int n);
```

```
void create_max_heap(int arr[], int n);
```

```
void max_heapify(int arr[], int n, int i);
```

```
int main() {
```

```
    int i, n;
```

```
    printf("Enter the array size (the array is an array representation of a heap): ");
```

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

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

```
    printf("Enter the array elements:\n");
```

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

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

```
    }
```

```
    printf("The array (heap) is: ");
```

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

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

```
    }
```

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

```
    heap_sort(arr, n);
```

```
    printf("After heap sort, the sorted array is: ");
```

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

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

```
    }
```

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

```
    return 0;
```

```
}
```

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

```

create_max_heap(arr, n);
for (int i = n - 1; i >= 1; i--) {
    int max = arr[0];
    arr[0] = arr[i];
    arr[i] = max;
    max_heapify(arr, i, 0);
}
}

```

```

void create_max_heap(int arr[], int n) {
    int last_non_leaf = (n - 1) / 2;
    for (int i = last_non_leaf; i >= 0; i--) {
        max_heapify(arr, n, i);
    }
}

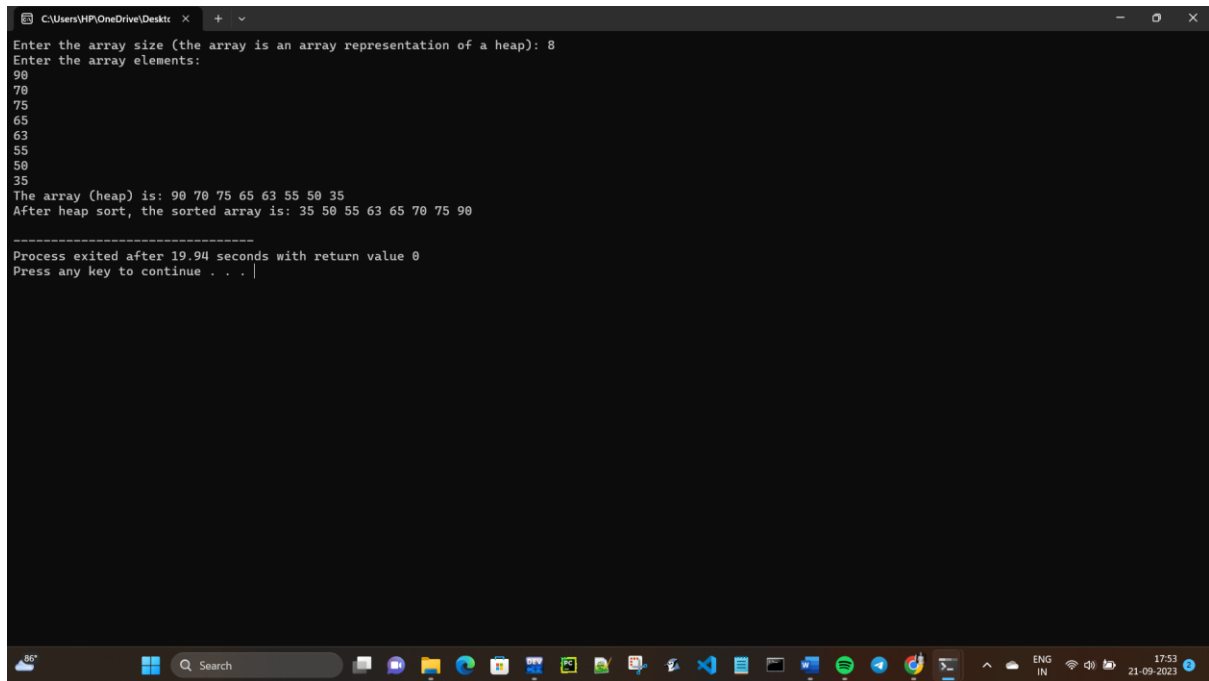
```

```

void max_heapify(int arr[], int n, int i) {
    int lc, rc, largest;
    lc = 2 * i + 1;
    rc = 2 * i + 2;
    if (lc < n && arr[lc] > arr[i]) {
        largest = lc;
    } else {
        largest = i;
    }
    if (rc < n && arr[rc] > arr[largest]) {
        largest = rc;
    }
    if (largest != i) {
        int temp = arr[i];
        arr[i] = arr[largest];

```

```
    arr[largest] = temp;
    max_heapify(arr, n, largest);
}
}
```



The screenshot shows a Windows command prompt window with the following text:

```
C:\Users\HP\OneDrive\Desktop >
Enter the array size (the array is an array representation of a heap): 8
Enter the array elements:
90
70
75
65
63
55
50
35
The array (heap) is: 90 70 75 65 63 55 50 35
After heap sort, the sorted array is: 35 50 55 63 65 70 75 90

-----
Process exited after 19.94 seconds with return value 0
Press any key to continue . . .
```

The window title bar shows the file path "C:\Users\HP\OneDrive\Desktop". The Windows taskbar at the bottom displays the search bar, task view button, and various application icons. The system tray on the right shows the date and time as "21-09-2023 17:53".