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# Python Program for Heap Sort

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Heap sort is a comparison based sorting technique based on Binary Heap data structure. It is similar to selection sort where we first find the maximum element at the end. We repeat the same process for remaining element.

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# Python program for implementation of heap Sort

# To heapify subtree rooted at index i.

# n is size of heap

```
def heapify(arr, n, i):
    largest = i # Initialize largest as root
    l = 2 * i + 1 # left = 2*i + 1
    r = 2 * i + 2 # right = 2*i + 2
```

# See if left child of root exists and is  
# greater than root

```
if l < n and arr[i] < arr[l]:
    largest = l
```

# See if right child of root exists and is  
# greater than root

```
if r < n and arr[largest] < arr[r]:
    largest = r
```

# Change root, if needed

```
if largest != i:
    arr[i], arr[largest] = arr[largest], arr[i] # swap
```

# Heapify the root.  
heapify(arr, n, largest)

# The main function to sort an array of given size

```
def heapSort(arr):
    n = len(arr)
```

# Build a maxheap.

```
for i in range(n, -1, -1):
    heapify(arr, n, i)
```

# One by one extract elements

```
for i in range(n-1, 0, -1):
    arr[i], arr[0] = arr[0], arr[i] # swap
    heapify(arr, i, 0)
```

# Driver code to test above

```
arr = [ 12, 11, 13, 5, 6, 7]
heapSort(arr)
n = len(arr)
print ("Sorted array is")
for i in range(n):
```

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### Output:

```
Sorted array is
5 6 7 11 12 13
```

Please refer complete article on [Heap Sort](#) for more details!

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