Heap Sort

Sreehari P Sreedhar, CB.SC.I5DAS20032

In [ ]:
```
# function to get at least 10 values in an array

def getVals(arr):

    print('Current length of array:', len(arr))
    print('Current array:', arr)

    arr += (input("Enter numbers separated by spaces: ").split())
    arr = [int(i) for i in arr if i.isdigit()]

    print('Current length of array:', len(arr))
    print('Current array:', arr)

    if len(arr) < 10:
        arr = getVals(arr)

    return arr
```

In [ ]:
```
def heap(arr, n, i):

    big = i
    l = 2 * i + 1 # left child
    r = 2 * i + 2 # right child

    if l < n and arr[l] > arr[big]: # if left child is bigger than parent
        big = l

    if r < n and arr[r] > arr[big]: # if right child is bigger than parent
        big = r

    if big != i: # if parent is not the biggest
        arr[i], arr[big] = arr[big], arr[i] # swap parent and biggest child
        heap(arr, n, big) # recurse
```

In [ ]:
```
def heapSort(arr):

    n = len(arr)

    for i in range(n, -1, -1): # build heap
        heap(arr, n, i)

    for i in range(n - 1, 0, -1): # sort
        arr[i], arr[0] = arr[0], arr[i] # swap biggest and last element
        heap(arr, i, 0) # rebuild heap

    return arr
```

In [ ]:
```
heapSort(getVals([]))
```

```
Current length of array: 0
Current array: []
Current length of array: 12
Current array: [2, 546, 75, 98, 7, 65, 9, 456, 34, 87, 978, 55]
```

Out[ ]:
```
[2, 7, 9, 34, 55, 65, 75, 87, 98, 456, 546, 978]
```

In [ ]: