模版·堆排序

```java
public class HeapSort{
    public static void heapSort(int[] arr){
        buildMaxHeap(arr);
        for(int i=arr.length-1;i>0;i--){
            swap(arr,0,i);
            shiftDown(arr,0,i-1);
        }
    }

    private static void buildMaxHeap(int[] arr){
        for(int i=arr.length/2-1;i>=0;i--){
            shiftDown(arr,i,arr.length-1);
        }
    }

    private static void shiftDown(int[] arr,int start,int end){
        int root=start;
        while(2*root+1<=end){
            int child=2*root+1;
            if(child+1<=end&&arr[child]<arr[child+1]){
                child++;
            }
        if(child<=end&&arr[root]<arr[child]){
            swap(arr,root,child);
            root=child;
        }else{
            return;
            }
        }
    }
```

```java
private static void swap(int[] arr,int i,int j){
    int temp=arr[i];
    arr[i]=arr[j];
    arr[j]=temp;
}
public static void main(String[] args){
    int[] arr={5,2,4,1,3};
    heapSort(arr);
    System.out.println(Arrays.toString(arr));
}
}
```