

Assignment 10

1. Implement the Heapsort.

Input: A number n that denotes the size of the heap (array);

Your program will generate a random array with n elements.

Output: 1) The random array;
2) The sorted array.

2. Implement a $O(n \lg k)$ algorithm to merge k sorted lists into a single list, where n is the total number of elements of all k lists.

Input: A number k to denote the number of sorted lists, and a number l to denote the size of all the (same-sized) sorted lists;

$(n = k \cdot l)$

Generate k random sorted lists each with l elements in following manner:

```
double a = 0, b=1;  
for(int i=0; i<l; i++){  
    randomize a number x between a and b;  
    a = x;  
}
```

Output: 1) The k randomly generated sorted lists;
2) The merged single sorted list.