**Data Structure\_2071035 Lee Somin**

**Technical Report – heapsort.cpp**

*Theorical Explanation of Functions in ‘heapsort.cpp’*

**typedef struct HeapType**

the structure contains the address of the root of the heap and the size of the heap.

**typedef struct element**

the structure contains the key of the heap element.

**Build\_max\_heap**

Inputs: Heaptype \*h

Return: non

This function is made for building the max heap within the time complexity of O(n). The elements are already put into the heap before the function starts. The function then checks if the node satisfies the heap property in bottom-up manner. When the node doesn’t satisfy the property, it swaps its key with its larger child and repeats swapping until it meets the property of heap. The larger child is determined by the ‘?’operator. If there is no right child to the node, then the node is compared with the left child.

**Runtime:**

|  |  |
| --- | --- |
| Input Size | Runtime |
| 10 | 0.00100 |
| 100 | 0.00000 |
| 1000 | 0.00000 |
| 5000 | 0.00100 |

(the runtime of input size 10 is long because of printing out sequence.)

(Result Screen Shot Continued)

**Result:**

Input size 10 :

텍스트이(가) 표시된 사진

자동 생성된 설명

Input size 100 :

텍스트이(가) 표시된 사진

자동 생성된 설명

Input size 1000 :

텍스트이(가) 표시된 사진

자동 생성된 설명

Input size 5000 :

텍스트이(가) 표시된 사진

자동 생성된 설명