# Lab#10 MAX HEAP Implementation

1. Main Program

* 초기 입력 데이타 (8 6 4 2 5 3) : 프로그램에서 선언
* Heap size : array size 8로 고정

2) Menu :
1.Insert, 2.Delete, 3. Search 4. Print 5.Empty-test, 6.Full-test,
7.Level-test 8. Quit

ADT:
- insert HEAP: 데이터 삽입
- delete HEAP: 데이터 삭제 (top element 만 삭제)
- Search HEAP: 데이터 탐색
- Empty-test : Boolean 함수
- Full-test : Boolean 함수
- Level-test : Heap의 Level 출력
- Print HEAP : Heap 의 내용을 출력

2. Testing 절차 (다음을 실행 후에는 HEAP의 내용을 출력할 것)

| **Command** | **Print** |
|---|---|
| 1) Create Heap with (8 6 4 2 5 3) | : (8 6 4 2 5 3) |
| 2) Insert 9 | : (9 6 8 2 5 3 4) |
| 3) Insert 7 | : (9 7 8 6 5 3 4 2) |
| 4) Empty test | : Heap is not Empty |
| 5) Full test | : Heap is full |
| 6) Level Test | : Heap Level 4 |
| 7) Delete | : (8 7 4 6 5 3 2) |

3. Algorithm (See lecture Note)

4. 화면 출력

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Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 4
Heap :   8 6 4 2 5 3
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 1

Enter a number to insert: 9
Heap :   9 6 8 2 5 3 4
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 1

Enter a number to insert: 7
Heap :   9 7 8 6 5 3 4 2
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 5
Heap is not Empty
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 6
 Heap is full
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 7
Level of Heap is 4
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 3
Enter a number to search: 12
 Not found
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 3
Enter a number to search: 4
4 is found
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 4
Heap :   9 7 8 6 5 3 4 2
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 2
Heap :   8 7 4 6 5 3 2
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit) 7
Level of Heap is 3
Enter Command:(1.insert, 2.delete, 3. search, 4.print, 5. Heap_empty  6. Heap_full 7.leveltest 8. quit)
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