

```
1: #include <stdio.h>
2:
3: #include <utility>
4:
5: #include "AdjacencyList.h"
6:
7: class Heap
8: {
9: public:
10:     Heap( int nVertex );
11:     ~Heap();
12:
13:     void insertOnHeap(int iVertex, int degree);
14:     bool removeFromHeap(std::pair<int, int> & highestPair);
15:
16:     void DecrementDegree( int iVertex );
17:
18:     bool HasVertex(int iVertex) const;
19:
20:     void print();
21: private:
22:     void allocate();
23:     bool swapWithFather(int iSlotIndex);
24:     void bubbleUpElement(int iSlotIndex);
25:     void bubbleDownElement(int iSlotIndex);
26:     int swapWithChildren(int iSlotIndex);
27:
28:
29:     int m_nVertex;
30:
31:     // Vector of [vertex, degree] pairs
32:     std::pair<int, int> * m_heapVector;
33:
34:     int * m_indexerHeap;
35:     int m_nextAvailableSlot;
36:
37: };
```