Objective(s):

a. To understand heap insertion and removal mechanism.

b. To understand the relationship between heap and priority queue.

Task 1: Create directory named pack8_Trees with package code inside. Study MyMinHeap's insert(int d) and remove() methods. Test L8_PQ_Main's demo1().

```
import code.*;
public class L8_PQ_Main {
  static ArrayList<Integer> least3;

  public static void main(String[] args) {
    println("-demo1---");
    demo1();
    // println("-demo2---");
    // demo2();
  }
  static void demo1() {
    least3 = new ArrayList<>();
    MyMinHeap heap = new MyMinHeap();
    heap.insert(11);    heap.insert(15);
    heap.insert(16);    heap.insert(13);
    heap.insert(17);    heap.insert(18);
    println("heap strucutre is " + heap);
    least3.add(heap.remove());
    least3.add(heap.remove());
    least3.add(heap.remove());
    println("least 3 value is " + least3);
  }
  static void demo2() {
    least3 = new ArrayList<>();
    MyPriorityQueue pq = new MyPriorityQueue();
    pq.enqueue(11);    pq.enqueue(15);
    pq.enqueue(16);    pq.enqueue(13);
    pq.enqueue(17);    pq.enqueue(18);
    pq.enqueue(19);   // <-- isFull() is true … discard
    println("pq structure is " + pq);
    least3.add(heap.remove());
    least3.add(heap.remove());
    least3.add(heap.remove());
    println("least 3 value is " + least3);
  }
}
```

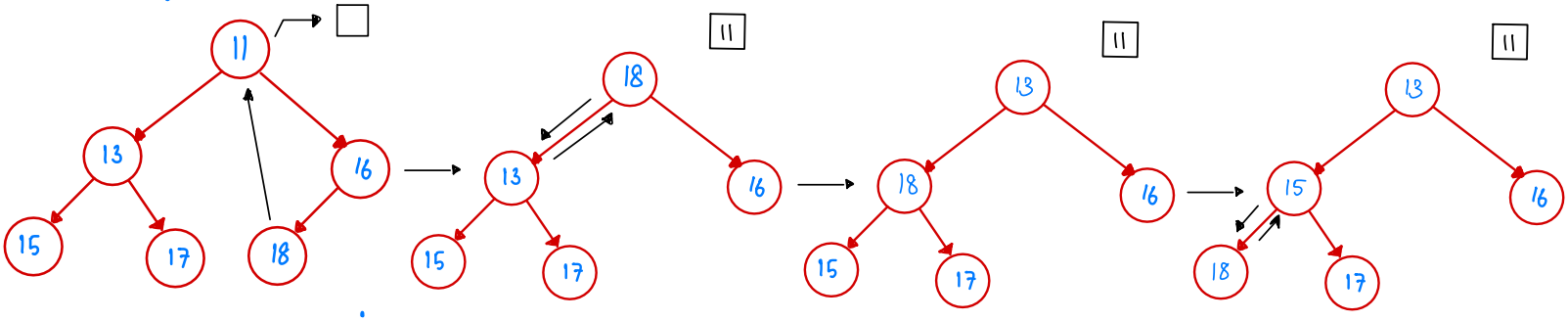
Task 2: Given an abstract class MyQueueInterface.java, implement MyPriorityQueue.java from MyMinHeap's capabilities.

Note that MyMinHeap's implementation is rudimentary because it does not check whether the heap is full or empty when insert or remove. Make sure that your enqueue() and dequeue() do not have such mistakes.

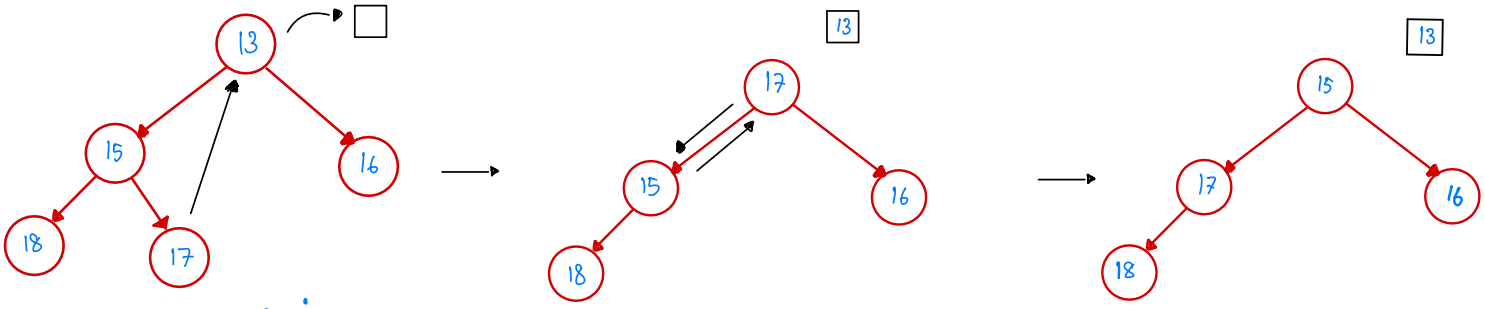
```
package code;

public interface MyQueueInterface {
    public void enqueue(int d);mp
    public int dequeue();
    public int front();
    public boolean isFull();
    public boolean isEmpty();
}
```

Task 3: draw / write the heap snapshot during each dequeue() was performed.

dequeue ครั้งที่ 1



dequeue ครั้งที่ 2



dequeue ครั้งที่ 3