**“Events” – Test black box**

A queue of events in a simulation system receives events. Each event has a time tag.

It is possible to extract events from the queue, the extraction must return the event with lower time tag.

The queue discards events with negative or null time tag.

The queue must accept at most 100.000 events.

Events with the same time tag must be merged (i.e. the second received is discarded)

public class EventsQueue{

public void reset();

// cancels all events

public void push(int timeTag) throws InvalidTag, QueueOverflow

public int pop() throws EmptyQueue

}

Define test cases

1 define equivalence classes, and related boundary condition

2 for each class, define at least one test case

Push (time tag)

Criteria:

timeTag sign

number of events received

same time tags received

Predicates

|  |  |  |
| --- | --- | --- |
| Sign of time tag | >0 | <=0 |
| Number of events | <=100.000 | >100000 |
| same | yes | No |

combinations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sign | Number of | Same | Valid invalid |  |
| >0 | <= 100000 | No | V | T1  EventsQueue e = new EventsQueue();  e.push(10);  e.push(15);  pop() == 10;  pop() == 15;  pop() 🡪 emptyQueue  T3B  EventsQueue e = new EventsQueue();  Int I=0;  repeat (100000 times) {  Push(i++) ;}  TB1on input  Push(0)  TB2on input  Push(-1)  TB3on input  Push(maxint)  TB4on input  Push(maxint -1)  TB5on input  Push(maxint +1) |
|  |  | Yes | V | T2  EventsQueue e = new EventsQueue();  e.push(10);  e.push(10);  pop() == 10;  pop() 🡪 emptyQueue |
|  | >100000 | No | I | T4  EventsQueue e = new EventsQueue();  Int I=0;  repeat (10000 times) {  Push(i++) ;}  Push(i) 🡪 QueueOverflow |
|  |  | Yes | I | T5  EventsQueue e = new EventsQueue();  Int I=0;  repeat (100000 times) {  Push(i); push(i++) ;}  //No queueOverflow //until this point  Push(i) 🡪 QueueOverflow |
| <=0 | <= 100000 | No | I | T6  EventsQueue e = new EventsQueue();  e.push (-1); 🡪 invalidTag() |
|  |  | Yes | I | EventsQueue e = new EventsQueue();  e.push (-1); push(-1) 🡪 invalidTag() |
|  | >100000 | No | I | T6 |
|  |  | Yes | I | T6 |

Pop ()

Criteria

Ordering from lowest to highest - ordered , not ordered elements in inut

Number of elements

|  |  |  |  |
| --- | --- | --- | --- |
| ordering | Number of elements |  |  |
| No | 1 to 100000 | V | EventsQueue e = new EventsQueue();  e.push(10);  e.push(15);  e.push(1);  e.push(44);  pop() == 1;  pop() == 10;  pop() == 15;  pop() == 44; |
|  | <1 | I | T2 or t1 |
|  | >100000 | I | T4 |
| yes | 1 to 100000 | V | EventsQueue e = new EventsQueue();  e.push(44);  e.push(15);  e.push(10);  e.push(1);  pop() == 1;  pop() == 10;  pop() == 15;  pop() == 44; |
|  | <1 | I | EventsQueue e = new EventsQueue();  e.push(44);  e.push(15);  e.push(10);  e.push(1);  pop() == 1;  pop() == 10;  pop() == 15;  pop() == 44;  pop() 🡪 emptyqueue |
|  | >100000 | I | T4 |