**LIST & QUEUE**

1. First important ADT: the LIST. Watch the following video until minute 13.07:

<http://www.youtube.com/watch?annotation_id=annotation_332430&feature=iv&index=2&list=PL2_aWCzGMAwI3W_JlcBbtYTwiQSsOTa6P&src_vid=92S4zgXN17o&v=HdFG8L1sajw>

1. Following the example given in the video above, create a **QUEUE** defining**:**
   1. the **Abstract Data Type**
   2. the **Concrete Data Type**.

A queue is an ordered list of elements. The order is given by the time of arrival, from the first to the last. The first element is called **head**, the last element is called **tail or bottom**. Moreover, the **F**irst element arriving **I**n the queue, is the **F**irst element getting **O**ut of the queue (FIFO structure). This means that an element can enter the queue only at the bottom and can exit the queue only from the head.

**Queue Terminology**:

* ENQUEUE: operation used to insert an element into the queue
* DEQUEUE: operation used to extract an element from the queue

Example of a queue: the line of people at a post office counter.

**Operational schema of a QUEUE:**

At the beginning the queue is empty:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

After three arrivals in the queue (three enqueues) we have:

|  |  |  |  |
| --- | --- | --- | --- |
| First element  arrived in the queue  1st to exit | Second element  arrived in the queue  2nd to exit | Third element  arrived in the queue  3rd to exit | A fourth element would be put here |

HEAD - 1st position 2nd position last position - TAIL

After the first dequeue (the first exit):

|  |  |  |  |
| --- | --- | --- | --- |
| Second element  arrived in the queue  1st to exit | Third element  arrived in the queue  2nd to exit |  |  |

HEAD - 1st position 2nd position - TAIL

REMEMBER:

* the ADT is a mathematical and logical model of the data properties and of the operations
* the CDT is an implementation of the ADT using a particular data structure

HINT:

* Define the CDT using an **array.** Follow the operational schema above.