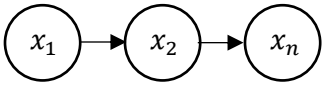
TAD Queue

Queue $= \{x_n \ldots x_3, x_2, x_1\}$

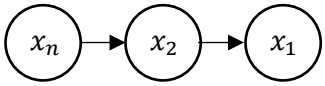
Where x_n is the last element added, x_1 is the first element added and x_1 will be the first element to leave.

Graphic representation

When the elements enter



When the elements come out



$\{inv: x_n = last\ element\ added\ and\ first\ element\ to\ leave\}$

Primitive operations

Name	Input	Output
Queue	…	Queue
IsEmpty	Queue	Boolean
Enqueue	Queue x element	Queue
Front	Queue	Element
getLast	Queue	Element
Dequeue	Queue	Element
Size	Queue	Integer
Search	Queue x element	Boolean

Queue( ) : Modifier
"Create a new empty queue"
$pre = \{true\}$ $pos = \{new\ queue\ to\ add\ elements\}$

Enqueue(T newItem) : Modifier
"Add an item to the bottom of the list"
$pre = \{queue\ created\}$ $pos = \{queue.size = queue.size + 1, buttom = newItem\}$

isEmpty( ) : Validation
"Allows to check if the queue has elements or not".
$pre = \{queue\ created\}$ $pos = \{true\ if\ the\ queue\ is\ empty, false\ if\ no\}$

Front( ) : Validation
“This function is used to reference the first or the oldest element of the queue container.”
$pre = \{queue\ != empty, front\ != null\}$ $pos = \{the\ first\ or\ the\ oldest\ element\}$

getLast( ) : Validation
“Return the last item in the list without deleting it.”
$pre = \{queue\ != empty, last\ != null\}$

Dequeue( ) : Modifier
“Gets the value and removes the first item from the queue”
$pre = \{queue\ created\}$ $pos = \{element\ in\ front\ and\ queue.size = queue.size - 1\}$

Size( ) : Validation
"Returns the number of elements in the queue"
$pre = \{queue\ created\}$ $pos = \{number\ of\ elements\ in\ the\ queue\}$

Search(T element) : Validation
“Returns a truth value if the searched element is found, if found it returns true, if not it returns false.”
$pre = \{queue\ created\ and\ queue\ != empty\}$ $pos = \{true\ if\ elemen\ is\ in\ the\ queue, if\ not\ return\ false\}$