TAD	Queue

Abstract object

$$\text{Queue} = \{(e_1, e_2, e_3, \dots e_n), \text{head}, \text{tail}\}$$

Inv: $size = n \ \wedge \ n \geq 0 \ \wedge \ \text{head} = e_1 \wedge \ \text{tail} = e_n$

Primitive operators

Name	Input	Output	Operation type
`Constructor`	N	Queue	Constructor
`enqueue`	Queue x e	Queue	Modifier
`dequeue`	Queue	element	Modifier
`Size`	Queue	int	Analyzer
`isEmpty`	Queue	Boolean	Analyzer

TAD	**HashTable**

Abstract object

$$\text{HashTable} = \{(e_1, e_2, e_3, \dots e_n), \text{size} = n\}$$

Inv: $\{element \mid element \in HashTable \wedge \big(\text{element} = (\text{key}, \text{value})\big) \wedge \big(\forall \text{element}_x \in HashTable \wedge \forall \text{element}_y \in HashTable\big) \rightarrow \Big(\big(element_y.key \neq element_x.key\big)\Big) \wedge (size \geq 0)\}$

Operadores Primitivos:

Name	Input	Output	Operation Type
`Constructor`		HashTable	Constructora
`insertOnHashTable`	HashTable x element	HashTable	Modificadora
`searchOnHashTable`	HashTable x key	value	Analizadora
`Delete`	HashTable x key	HashTable	Modificadora

TAD	PriorityQueue

$A = [a_{[0]} \ldots a_{[n-1]}]$

Invariants:

- PriorityQueue.size>=0

Operations:

Name	Input	Output	OperationType
`PriorityQueue`			Constructor
`Insert`	PriorityQueue x element	Queue	Modifier
`Maximum`	PriorityQueue	element	Analyzer
`Extract-Max`	PriorityQueue	element	Modifier
`isEmpty`	PriorityQueue	boolean	Analyzer
`occupiedSize`	PriorityQueue	int	Analyzer
`sortGrMin`	PriorityQueue		Modifier
`sortMinGr`	PriorityQueue		Modifier