

ADT PriorityQueue		
PriorityQueue = {values [] = <value1, value2, ..., valuen>, size= <size>}		
{inv: PriorityQueue.values [] <value <sub>i*2</sub> ≤ value <sub>i*2+1</sub> }		
{inv: PriorityQueue.size >=0}		
Primitives Operations:		
• CreatePriorityQueue:		-> PriorityQueue
• insert:	PriorityQueueex Value	-> PriorityQueue
• size:		-> Integer
• peek:		-> Value
• extract:		-> Value
• update:		-> PriorityQueue

CreatePriorityQueue:
"It creates a new PriorityQueue with a predetermine size"
{Pre: PriorityQueue == null}
{Post: PriorityQueue = Values [] = {null1, null2, ..., null16}, size=0}

insert:
"It inserts a new value"
{Pre: PriorityQueue != null}
{Post: PriorityQueue = Values [] = {value <sub>k</sub> = input Value}, size=size+1}

peek:
"it allows have a view of the first element without extract it"
{Pre: PriorityQueue != null, size>=1}
{Post: true}

size:
"returns the size of the PriorityQueue"
{Pre: PriorityQueue != null}
{Post: true}

Extract:
"returns and remove the first element of the queue"
{Pre: PriorityQueue!= null, size>=1}
{Post: PriorityQueue = Values [] = {values <sub>1</sub> = null }, size=size-1}

update:
"Allows heapify"
{Pre: PriorityQueue != null, size>=1}

{Post: PriorityQueue.values []  $<value_{i*2} \leq value_{i*2+1}$ }