| TAD CustomHashMap |
| --- |
| CustomHashMap =  { Size = <size>, Table = <table>, Default\_Capacity = <16>, Load\_Factor = <0.75> } |
| { inv: CustomHashMap.size >= 0 } |
| Operaciones Primitivas:   * CustomHashMap: → CustomHashMap * Put: Key x Value → CustomHashMap * Get: Key → Value * Remove: Key → Value * Size: → Integer * Hash: Key → Integer * GetIndex: Hash → Integer * Resize: →HashTable * KeySet: →CustomLinkedList |

| CustomHashMap() |
| --- |
| “Creates a new CustomHashMap with size 0” |
| { pre: } |
| { pos: CustomHashMap = { Size = <size>, Table = <table>, Default\_Capacity = <16>, Load\_Factor = <0.75> } } |

| Put(K, V) |
| --- |
| “Inserts a new value into the HashMap” |
| { pre: HashMap != null, K != null } |
| { pos: size++, (K, V) ∈ table } |

| Get(K) |
| --- |
| “Returns the value of a key” |
| { pre: Key != nil } |
| { pos: <Value> } |

| Remove(K) |
| --- |
| “Deletes an element from the table and returns its value” |
| { pre: Key != nil } |
| { pos: <Value>, <Value> ∉ table } |

| Size() |
| --- |
| “Returns size of HashMap” |
| { pre: HashMap != null } |
| { pos: <Size> } |

| Hash(K) |
| --- |
| “Returns the hashcode of a map entry” |
| { pre: Key != nil } |
| { pos: <Hash> } |

| GetIndex(Hash) |
| --- |
| “Returns the index to which a Hash belongs to” |
| { pre: } |
| { pos: <Index> } |

| Resize() |
| --- |
| “Creates a new Table with all its elements, and double its capacity” |
| { pre: Table.capacity = 2^n, n ∈ N ⋀ n >= 4 } |
| { pos: Table.capacity \*= 2 } |

| KeySet() |
| --- |
| “Returns a CustomLinkedList with all the Keys in the table” |
| { pre: Table != null } |
| { pos: <KeySet> } |

| TAD CustomLinkedList |
| --- |
| CustomLinkedList =  { Head = <head>, Size = <size> } |
| { inv: size >= 0 } |
| Operaciones Primitivas:   * CustomLinkedList →CustomLinkedList * Add: Element →CustomLinkedList * Size: →Size * Get: Index →Element * Iterator: →CustomIterator |

| CustomLinkedList() |
| --- |
| “Creates a CustomLinkedList with head null and size 0” |
| { pre: } |
| { pos: head = null, size = 0 } |

| Add(E) |
| --- |
| “Adds an element at the head of the CustomLinkedList” |
| { pre: CustomLinkedList.head = currHead } |
| { pos: Node<E>.next = currHead, CustomLinkedList.head = Node<E> } |

| Size() |
| --- |
| “Returns the size (total of nodes) of the CustomLinkedList” |
| { pre: CustomLinkedList = { …, Size = <size> … } } |
| { pos: <size> } |

| Get(Index) |
| --- |
| “Returns the element that belongs to the index Index” |
| { pre: Index ∈ Z ⋀ 0 <= Index < Size } |
| { pos: <E> } |

| Iterator() |
| --- |
| “Returns a custom iterator, starting at node Head” |
| { pre: } |
| { pos: <CustomIterator> } |