|  |  |  |
| --- | --- | --- |
| Binary search tree  **Name:** BST | | |
| **Definition:**  Value is the list’s type.  Key is the value’s identifier | | |
| **Input:** {key: the value used to manage order and search the members’ tree; Value: the value that must be stored} | | |
| **Invariable:** | | |
| **Operations** | | |
| **Name** | **Input** | **Output** |
| Create BST  **constructor** |  | Creates a new BST |
| Add  **modifier** | BST, Key, Value | BST with the new key and value associated to a new node |
| remove  **modifier** | BST, Key | BST without the value associated to the key given |
| Search  **analyzer** | BST, key | Value associated to the key |

Operations

|  |  |  |  |
| --- | --- | --- | --- |
| **Operation:**  Create BST | | | |
| **Operation type:** constructor | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
|  | Creates a new empty BST | true | Creates a new BST |
| Creates a new BST with 0 elements which can be used. | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Operation:**  Add | | | |
| **Operation type:** modifier | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| BST, key, Value | BST within the new key and value associated to a ordered position | BST must be initialized | Adds a new element with the key and value given in a specific position |
| Adds the value and key given to the BST | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Operation:**  Remove | | | |
| **Operation type: modifier** | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| BST, key | BST without the element associated to the key given | BST must be initialized and have at least 1 element | Removes the element associated to the key |
| Removes the value associated to the key from BST | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Operation:**  Search | | | |
| **Operation type:** analyzer | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| BST, key | The value associated to the key | BST must be initialized | Gets the value associated to the key |
| Gets the value associated to the key | | | |