ADT Set - Domain

- Domain of the ADT Set:
  $\mathcal{S} = \{s | \text{s is a set with elements of the type TElem}\}$

ADT Set - Interface I

- init (s)
  - **descr:** creates a new empty set
  - **pre:** true
  - **post:** $s \in \mathcal{S}$, s is an empty set.

ADT Set - Interface II

- add(s, e)
  - **descr:** adds a new element into the set if it is not already in the set
  - **pre:** $s \in \mathcal{S}$, $e \in TElem$
  - **post:**$s' \in \mathcal{S}$, $s' = s \cup \{e\}$ (e is added only if it is not in s yet. If s contains the element e already, no change is made).
    $add \leftarrow$ true if e was added to the set, *false* otherwise.

ADT Set - Interface III

- remove(s, e)
  - **descr:** removes an element from the set.
  - **pre:** $s \in \mathcal{S}$, $e \in TElem$
  - **post:** $s \in \mathcal{S}$, $s' = s \setminus \{e\}$ (if e is not in s, s is not changed). *remove* $\leftarrow$ true, if e was removed, *false* otherwise

ADT Set - Interface IV

- search(s, e)
  - **descr:** verifies if an element is in the set.
  - **pre:** $s \in \mathcal{S}$, $e \in TElem$
  - **post:**

$$search \leftarrow \begin{cases} True, & \text{if } e \in s \\ False, & \text{otherwise} \end{cases}$$

ADT Set - Interface V

- size(s)
  - **descr:** returns the number of elements from a set
  - **pre:** $s \in \mathcal{S}$
  - **post:** size $\leftarrow$ the number of elements from s

ADT Set - Interface VI

- isEmpty(s)
  - **descr:** verifies if the set is empty
  - **pre:** $s \in \mathcal{S}$
  - **post:**

$$isEmpty \leftarrow \begin{cases} True, & \text{if } s \text{ has no elements} \\ False, & \text{otherwise} \end{cases}$$

ADT Set - Interface VII

- iterator(s, it)
  - **descr:** returns an iterator for a set
  - **pre:** $s \in \mathcal{S}$
  - **post:** $it \in \mathcal{I}$, it is an iterator over the set s

ADT Set - Interface VIII

- destroy (s)
  - **descr:** destroys a set
  - **pre:** $s \in S$
  - **post:**the set s was destroyed.

ADT Set - Interface IX

- Other possible operations (characteristic for sets from mathematics):
  - reunion of two sets
  - intersection of two sets
  - difference of two sets (elements that are present in the first set, but not in the second one)