Idea

The Idea behind the ADT of a Stack is to provide a collection of data with two primary operations:

- *push*: Push a new item on top of the stack.
- *pop*: Take the item on top of the stack off.

Definition

We define the ADT as the following 5-Tuple:

$$\mathcal{D} = (N, P, Fs, Ts, Ax),$$

where the components are defined as follows:

1. $N :=$ Stack
2. $P :=$ {Element}
3. $Fs :=$ {stack, push, pop, top, isEmpty}
4. Ts is the set containing the following type specifications:
   (a) stack : Stack
   (b) push : Stack $\times$ Element $\to$ Stack
   (c) pop : Stack $\to$ Stack $\cup\{\Omega\}$
   (d) top : Stack $\to$ Stack$\cup\{\Omega\}$
   (e) isEmpty : Stack $\to \mathbb{B}$
5. Ax is the set containing the following axioms:
   (a) stack().top() $= \Omega$
   (b) stack().pop() $= \Omega$
   (c) S.push(x).top() $= x$
   (d) S.push(x).pop() $= S$
   (e) S.top() $= \Omega \iff$ S.isEmpty() = true

Implementation

TBD