

## 1. Signatures:

The constructors are:

```
empty-stack : () --> Stack
push       : Stack X SchemeVal --> Stack
```

The observers are:

```
top          : Stack --> SchemeVal U {error: top
                                   empty stack}
pop          : Stack --> Stack U {error: pop
                                   empty stack}
empty-stack? : Stack --> Boolean
```

## 2.

```
(empty-stack)           =  $\lceil \Theta \rceil$ 
(push  $\lceil f \rceil$  v)     =  $\lceil g \rceil$ 
```

Where (top  $\lceil g \rceil$ ) = v

And

(pop  $\lceil g \rceil$ ) =  $\lceil f \rceil$

```
(empty-stack? stack) =  $\begin{cases} \#T & \text{Stack} = \lceil \Theta \rceil \\ \#F & \text{Stack} \neq \lceil \Theta \rceil \end{cases}$ 
```

```
(top (push stk1 v1)) = v1
(top (empty-stack))  = error
(pop (push stk1 Var)) = stk1
(pop (empty-stack))  = error
```