e ::=		*Expressions*
	$false$	
	$true$	
	i	Integers
	s	Strings
	`succ` e	
	`pred` e	
	`iszero` e	
	`if` e `then` e `else` e	
	`concat` e e	
	`isstring` e	
	`isint` e	
	`isbool` e	
t ::=		
	$Bool$	
	Int	
	$String$	

$$[\text{SS-SUCC}] \quad \frac{e_1 \to e_1'}{succ\ e \to e_1}$$

$$[\text{SS-SUCC}] \quad \frac{i' = i + 1}{succ\ i \to i'}$$

$$[\text{SS-PRED}] \quad \frac{e_1 \to e_1'}{pred\ e \to e_1}$$

$$[\text{SS-PRED}] \quad \frac{i' = i - 1}{pred\ i \to i'}$$

$$[\text{SS-ISZERO}] \quad \frac{e \to e'}{iszero\ e \to e'}$$

$$[\text{SS-ISZERO}] \quad \frac{}{iszero\ 0 \to true}$$

$$[\text{SS-ISZERO}] \quad \frac{i \neq 0}{iszero\ i \to false}$$

$$[\text{SS-IF}] \quad \frac{e_1 \to e_1'}{\texttt{if}\ e_1\ \texttt{then}\ e_2\ \texttt{else}\ e_3 \to \texttt{if}\ e_1'\ \texttt{then}\ e_2\ \texttt{else}\ e_3}$$

$$[\text{SS-IF}] \quad \frac{}{\texttt{if true then}\ e_2\ \texttt{else}\ e_3 \to e_2}$$

$$[\text{SS-IF}] \quad \frac{}{\texttt{if false then}\ e_2\ \texttt{else}\ e_3 \to e_3}$$

$$[\text{SS-CONCAT}] \quad \frac{e_1 \to e_1'}{concat\ e_1\ e_2 \to concat\ e_1'\ e_2}$$

$$[\text{SS-CONCAT}] \quad \frac{e_2 \to e_2'}{concat\ s_1\ e_2 \to concat\ s_1\ e_2}$$

$$[\text{SS-CONCAT}] \quad \frac{s_3 = concat\ s_1\ s_2}{concat\ s_1\ s_2 \to s_3}$$

$$[\text{SS-ISBOOL}] \quad \frac{e \to e'}{isbool\ e \to e'}$$

$$[\text{SS-ISBOOL}] \quad \frac{}{isbool\ false \to true}$$

$$[\text{SS-ISBOOL}] \quad \frac{}{isbool\ true \to true}$$

$$[\text{SS-ISBOOL}] \quad \frac{}{isbool\ i \to false}$$

$$[\text{SS-ISBOOL}] \quad \frac{}{isbool\ s \to false}$$

$$[\text{SS-ISINT}] \quad \frac{e \to e'}{isint\ e \to e'}$$

$$[\text{SS-ISINT}] \quad \frac{}{isint\ false \to false}$$

$$[\text{SS-ISINT}] \quad \frac{}{isint\ true \to false}$$

$$[\text{SS-ISINT}] \quad \frac{}{isint\ i \to true}$$

$$[\text{SS-ISINT}] \quad \frac{}{isbool\ s \to false}$$

$$[\text{SS-ISSTRING}] \quad \frac{e \to e'}{isstring\ e \to e'}$$

$$[\text{SS-ISSTRING}] \quad \frac{}{isstring\ false \to false}$$

$$[\text{SS-ISSTRING}] \quad \frac{}{isstring\ true \to false}$$

$$[\text{SS-ISSTRING}] \quad \frac{}{isstring\ i \to false}$$

$$[\text{SS-ISSTRING}] \quad \frac{}{isstring\ s \to true}$$

$$[\text{TS-SUCC}] \quad \frac{e : Int}{succ\ e : Int}$$

$$[\text{TS-PRED}] \quad \frac{e : Int}{pred\ e : Int}$$

$$[\text{TS-ISZERO}] \quad \frac{e : Int}{iszero\ e : Bool}$$

$$[\text{TS-ISBOOL}] \quad \frac{e : Bool}{isbool\ e : Bool}$$

$$[\text{TS-ISINT}] \quad \frac{e : Int}{isint\ e : Bool}$$

$$[\text{TS-ISTRING}] \quad \frac{e : T}{istring\ e : Bool}$$

$$[\text{TS-IF}] \quad \frac{\begin{array}{c} e_1 : Bool \\ e_2 : T \\ e_3 : T \end{array}}{\texttt{if}\ e_1\ \texttt{then}\ e_2\ \texttt{else}\ e_3 : T}$$

$$[\text{TS-CONCAT}] \quad \frac{\begin{array}{c} e_1 : String \\ e_2 : String \end{array}}{contac\ e1\ e2 : String}$$