

|  |  |   |
|--|--|---|
| <i>termvar</i> , $x, y$<br><i>funcname</i> , <b>name</b><br><i>indecies</i> , $i, j$<br><i>program</i> , $p$ | $::=$<br> <br>  <b>func name</b> ( $x_1, \dots, x_i$ ){ $b$ }<br>  $p_1 p_2$<br>  ( $p$ )  | Programs  |
| $b$  | $::=$<br>  $x$<br>  <b>T</b><br>  <b>F</b><br>  if $b_1$ then $b_2$ else $b_3$<br>  <b>name</b> ( $b_1, \dots, b_i$ )<br>  return $b$<br>  $C[b]$<br>  ( $b$ ) | Terms<br>A variable<br>Logical true<br>Logical false<br>Pattern Matching for booleans<br>Return of a term<br><br>Plugging the hole in $C$ gives a term. |
| $v$  | $::=$<br>  <b>T</b><br>  <b>F</b>  | Values  |
| $\Delta$   | $::=$<br>  $p_1$<br>  $\Delta_1, \Delta_2$   | Contexts of Function Definitions  |
| $TP$   | $::=$<br>  $\emptyset$<br>  $b, TP$  | List of Term Parameters<br>Empty List<br>Term Argument  |
| $CP$   | $::=$<br>  $\emptyset$<br>  $C, TP$<br>  $b, CP_2$   | Evaluation Contexts for Parameters<br>Empty List<br>Context Evaluation Argument<br>Term Argument  |
| <i>evalctx</i> , $C$   | $::=$<br>  $\square$<br>  <b>T</b><br>  <b>F</b><br>  if $C$ then $b_2$ else $b_3$<br>  <b>name</b> ( $CP$ )<br>  return $b$<br>  ( $C$ )                      | Evaluation Contexts<br>The hole (location of the evaluation point)  |

$\boxed{\Delta \vdash b_1 \rightsquigarrow b_2}$  Single-Step Reduction for Terms

$$\frac{}{\Delta \vdash \text{if } \mathbf{T} \text{ then } b_1 \text{ else } b_2 \rightsquigarrow b_1} \text{IFT}$$

$$\frac{}{\Delta \vdash \text{if } \mathbf{F} \text{ then } b_1 \text{ else } b_2 \rightsquigarrow b_2} \text{IFF}$$

$$\frac{}{\Delta \vdash \text{return } b \rightsquigarrow b} \text{RETURN}$$

$$\frac{(\text{func name}(x_1, \dots, x_i)\{b\}) \in \Delta}{\Delta \vdash \text{name}(v_1, \dots, v_i) \rightsquigarrow [v_1, \dots, v_i/x_1, \dots, x_i]b} \quad \text{BETA}$$

$\Delta \vdash b_1 \rightsquigarrow^* b_2$     Multi-Step Reduction for Terms

$$\frac{\Delta \vdash b_1 \rightsquigarrow b_2}{\Delta \vdash C[b_1] \rightsquigarrow^* C[b_2]} \quad \text{STEP}$$

$$\frac{\Delta \vdash b_1 \rightsquigarrow b_2 \quad \Delta \vdash C[b_2] \rightsquigarrow^* C[b_3]}{\Delta \vdash C[b_1] \rightsquigarrow^* C[b_3]} \quad \text{MULT}$$

Definition rules:                    6 good        0 bad

Definition rule clauses: 9 good        0 bad