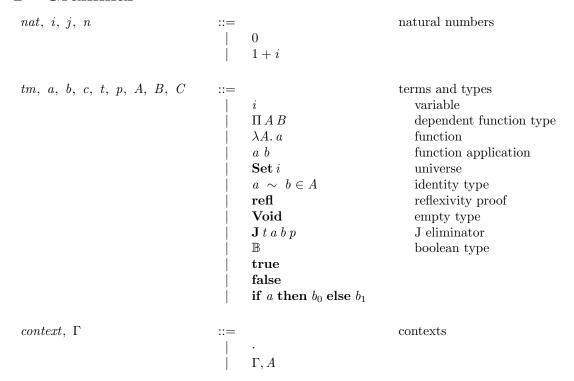
# System Specification

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#### 1 Grammar



## 2 Dynamics

$$\begin{array}{c} \boxed{a \Leftrightarrow b} \\ \\ \frac{a \Rightarrow^{+} c \qquad b \Rightarrow^{+} c}{a \Leftrightarrow b} \end{array}$$

### 3 Statics

 $\mathbf{refl}\Rightarrow\mathbf{refl}$ 

P-Refl

$$\begin{array}{c|c} \hline \vdash \Gamma \\ \hline \\ \text{CTX-EMPTY} \\ \hline \vdash \vdots \\ \hline \end{array} \qquad \begin{array}{c} \text{CTX-CONS} \\ \vdash \Gamma \quad \Gamma \vdash A : \mathbf{Set} \ i \\ \hline \vdash \Gamma . \ A \\ \hline \end{array}$$

 $egin{array}{lll} t_0 &\Rightarrow t_1 & a_0 \Rightarrow a_1 \ b_0 &\Rightarrow b_1 & p \Rightarrow \mathbf{refl} \ \hline \mathbf{J} \ t_0 \ a_0 \ b_0 \ p \Rightarrow t_1 \end{array}$ 

 $t_0 \Rightarrow t_1 \qquad a_0 \Rightarrow a_1$   $b_0 \Rightarrow b_1 \qquad p_0 \Rightarrow p_1$   $\mathbf{J} t_0 a_0 b_0 p_0 \Rightarrow \mathbf{J} t_1 a_1 b_1 p_1$ 

```
\Gamma \vdash a : A
                                                                                                                                                                (Typing)
                                                                                                                            T-PI
                                                                                                                                 \Gamma \vdash A : \mathbf{Set} \ i
             T-Var
                                                                   T-Set
             \vdash \Gamma  i < |\Gamma|
                                                                                                                              \Gamma, A \vdash B : \mathbf{Set} \ i
                                                                      \vdash \Gamma
                                                                                         i < j
              \Gamma \vdash i : \uparrow^{1+i} \Gamma_i
                                                                   \overline{\Gamma \vdash \mathbf{Set} \ i : \mathbf{Set} \ j}
                                                                                                                            \overline{\Gamma \vdash \Pi A B : \mathbf{Set} \ i}
                                                                                                                                   T-Conv
                                                                                                                                       \Gamma \vdash a : A
                                                                             T-App
               T-Abs
                      \Gamma, A \vdash b : B
                                                                                                                                   \Gamma \vdash B : \mathbf{Set} \ i
                                                                              \Gamma \vdash b : \Pi A B
                \Gamma \vdash \Pi \, A \, B : \mathbf{Set} \; i
                                                                                  \Gamma \vdash a : A
                                                                                                                                         A \Leftrightarrow B
                                                                                                                                       \Gamma \vdash a : B
                \Gamma \vdash \lambda A. \ b : \Pi A B
                                                                              \Gamma \vdash b \ a : B[a]
                                                              T-J
                                                                         \Gamma \vdash a : A \qquad \Gamma \vdash b : A
                                                                                   \Gamma \vdash A : \mathbf{Set} j
                                                                             \Gamma \vdash p: a \ \sim \ b \in A
                                                               \Gamma, A, 0 \ \sim \ \uparrow \ a \in \ \uparrow \ A \vdash \ C : \mathbf{Set} \ i
                                                                                                                                                   \operatorname{T-Bool}
T\text{-}Refl
     \vdash \Gamma
                       \Gamma \vdash a : A
                                                                               \Gamma \vdash t : C[a, \mathbf{refl}]
                                                                                                                                                              \vdash \Gamma
\Gamma \vdash \mathbf{refl} : a \sim a \in A
                                                                           \Gamma \vdash \mathbf{J} \ t \ a \ b \ p : C[b, p]
                                                                                                                                                    \overline{\Gamma \vdash \mathbb{B} : \mathbf{Set} \ i}
                                                                                                       T-IF
                                                                                                                             \Gamma \vdash a : \mathbb{B}
                                                                                                                            \Gamma \vdash b_0 : A
         T-True
                                                        T-False
                   \vdash \Gamma
                                                                  \vdash \Gamma
                                                                                                                            \Gamma \vdash b_1 : A
         \overline{\Gamma \vdash \mathbf{true} : \mathbb{B}}
                                                        \overline{\Gamma \vdash \mathbf{false} : \mathbb{B}}
                                                                                                        \Gamma \vdash \mathbf{if} \ a \ \mathbf{then} \ b_0 \ \mathbf{else} \ b_1 : A
                                                                     T-Void
                                                                                    \vdash \Gamma
                                                                     \overline{\Gamma \vdash \mathbf{Void} : \mathbf{Set} \ i}
```