Funcons-beta: Returning

The PLanCompS Project

`Funcons-beta/Computations/Abnormal/Returning/Returning.cbs`*

Returning

[*Datatype* returning
  Funcon returned
  Funcon finalise-returning
  Funcon return
  Funcon handle-return]

Meta-variables T <: values

Datatype returning ::= returned(_ : values)

returned($V^?$) is a reason for abrupt termination.

Funcon finalise-returning(X : ⇒ T) : ⇒ T | null-type
  ⇝ finalise-abrupting(X)

finalise-returning(X) handles abrupt termination of X due to executing return(V).

Funcon return(V : T) : ⇒ empty-type
  ⇝ abrupt(returned(V))

return(V) abruptly terminates all enclosing computations until it is handled, then giving V. Note that V may be null-value.

Funcon handle-return(_ : ⇒ T) : ⇒ T

*Suggestions for improvement: `plancomps@gmail.com`.
Issues: `https://github.com/plancomps/CBS-beta/issues`.

$\mathsf{handle\text{-}return}(X)$ first evaluates X. If X either terminates abruptly for reason $\mathsf{returned}(V)$, or terminates normally with value V, it gives V.

$$\textit{Rule}\ \frac{X \xrightarrow{\mathsf{abrupted}(\ )} X'}{\mathsf{handle\text{-}return}(X) \xrightarrow{\mathsf{abrupted}(\ )} \mathsf{handle\text{-}return}(X')}$$

$$\textit{Rule}\ \frac{X \xrightarrow{\mathsf{abrupted}(\mathsf{returned}(V : \mathsf{values}))} X'}{\mathsf{handle\text{-}return}(X) \xrightarrow{\mathsf{abrupted}(\ )} V}$$

$$\textit{Rule}\ \frac{X \xrightarrow{\mathsf{abrupted}(V' : \sim \mathsf{returning})} X'}{\mathsf{handle\text{-}return}(X) \xrightarrow{\mathsf{abrupted}(V')} \mathsf{handle\text{-}return}(X')}$$

$$\textit{Rule}\ \mathsf{handle\text{-}return}(V : T) \rightsquigarrow V$$