

Funcons-beta: Returning *

The PPlanCompS Project

Returning.cbs | PLAIN | PRETTY

Returning

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

Meta-variables $T <: \text{values}$

Datatype `returning` ::= `returned(_ : values)`

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

Funcon `finalise-returning`($X : \Rightarrow T$) : $\Rightarrow T$ | `null-type`
 \rightsquigarrow `finalise-abrupting`(X)

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

Funcon `return`($V : T$) : $\Rightarrow \text{empty-type}$
 \rightsquigarrow `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`($_ : \Rightarrow T$) : $\Rightarrow T$

`handle-return`(X) first evaluates X . If X either terminates abruptly for reason `returned(V)`, or terminates normally with value V , it gives V .

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

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

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

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

*Suggestions for improvement: plancomps@gmail.com.
Reports of issues: <https://github.com/plancomps/CBS-beta/issues>.