

# An Event-B Specification of Typing Tests

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I assume that typing can be made arbitrarily smart, however I do not yet know the limits of how much typing Rodin can do.

For sure both evbt and Rodin does explicit typing based on statements like: ‘ $x \in \mathbb{N}$ ’ ‘ $\text{alfa} \in \mathbb{N} \rightarrow \text{BOOL}$ ’ or ‘ $p \in \text{STAFF}$ ’

But Rodin also does implicit typing based on operations. For example:

“ ‘ $\text{@inv1 } \text{alfa} \in \mathbb{N} \rightarrow \text{BOOL} \text{ @inv2 } \text{beta} \cap \text{ran(alfa)} = \emptyset$  ’ ”

The disjunction forces the type of beta to be the same as the type of ran(alfa) ie  $\mathbb{N}$ .

“ ‘ $\text{@inv3 } x \in \mathbb{N} \text{ @inv4 } x+y=7$  ’ ”

The addition forces Rodin the type of y to be  $\mathbb{Z}$  (not  $\mathbb{N}$ !!)

This projects tests the extent of implicit typing implemented so far in evbt.

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<b>1</b>	<b>MACHINE MoreTyping</b>	<b>2</b>
1.1	<i>alfa beta x y</i> . . . . .	2
1.2	<i>gamma(b)</i> . . . . .	2

## VARIABLES

1.1

*alfa*  
*beta*  
*x*  
*y*

## INVARIANTS

**inv1:**  $alfa \in \mathbb{N} \leftrightarrow \text{BOOL}$   
**inv2:**  $beta \cap \text{ran}(alfa) = \emptyset$     The type of  $\text{ran}(alfa)$  will propagate to  $beta$ .  
**inv3:**  $x \in \mathbb{N}$   
**inv4:**  $x + y = 7$     The type of  $y$  is deduced to  $\mathbb{Z}$ .

## EVENT INITIALISATION

## THEN

**init1:**  $alfa := \emptyset$   
**init2:**  $beta := \emptyset$   
**init3:**  $x := 14$   
**init4:**  $y := 7$

## END

## EVENT gamma

1.2

## ANY

*b*

## WHERE

**grd11:**  $b \in beta$

## THEN

**act11:**  $beta := beta \setminus \{b\}$

## END

alfa, 2

beta, 2

gamma, 2

INITIALISATION, 2

MoreTyping, 2

x, 2

y, 2