

Example 5: Prototype Deductive System

Mango now has the capacity to distinguish between "good" and "bad" cases, where in principle the user could moderate this distinction. Currently throwing an exception is defined as bad, and everything else is good. In the spec for ItsAWrap.clear(), the bad cases are faded. In the pictures below, we use the bad case info in hierarchical form, plus info about loop initial conditions and the actual loop specification. These facts all come together to enable a deductive system to guess the hypothesis  $10 \leq \text{length}(x)$  for loop termination via the "good" exit.

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Greetings frank, welcome to Mango!

Specification ⌘

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Specifying loop at 40: for(int i=0;i<10;++i){
40: for(int i=0;i<10;++i){ []
Hypothesis: op0 is less than 10
Hypothesis: x is defined
Hypothesis: i is less than length of the array x
Hypothesis: i is greater than or equal to 0
x[i] = 0
i = i + 1
op0 = i + 1
Specifying method: void baseline.ItsAWrap.clear(int[])
40: for(int i=0;i<10;++i){ []
40: for(int i=0;i<10;++i){ [1]
40: for(int i=0;i<10;++i){ [1.1]
Bad conjecture: i^ is less than 10
41: x[i]=0; throws NullPointerException [1.1.1] Bad
Bad hypothesis: x is undefined
41: x[i]=0; throws ArrayIndexOutOfBoundsException [1.1.2] Bad
Bad hypothesis: x is defined
Bad conjecture: i^ is greater than or equal to length of the array x OR i^ is less than 0
43: } [1.2] Good
Conjecture: i^ is greater than or equal to 10
output heap of #12_iloop_i<Alpha>
stack
No return value.
        
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