

## **Wikiprint Book**

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### Example 3: Automatically Generated Report

The following report is for the ItsAWrap class of example 2. This report is generated by the totally automated, unfiltered Mango process. The cases are not mutually exclusive because the hypotheses required to prove the conjectures made in the clear() routine are missing. Development of the new HintManager is underway to address this problem manually, but automated solutions would greatly increase the power of the tool. The red underlined references are to byte code, but eventually will redirect to source code. An option to filter out cases which throw exceptions will soon be added. This eliminates a lot of clutter, but is not a good thing to do if exceptions are a part of nominal execution. In time more selective filtering of exceptions will be available. Also, certain cases could be consolidated via linear arithmetic, which exists in the tool but is not currently hooked up. Cases which just drop off the edge are artifacts of the graph traversal algorithm, easily filtered out.

### Report for ItsAWrap

baseline

ItsAWrap

clear([I)V

40: for(int i=0;i<10;++i){ [1]

41: x[i]=0; [1.1]

-1: #6: ArrayIndexOutOfBoundsException [1.1.1]

Hypothesis: x is defined

Conjecture: i^ is greater than or equal to length of the array x OR i^ is less than 0

output heap of #12\_iloop\_i<loop1>

Throws: java.lang.ArrayIndexOutOfBoundsException.

-1: #6: NullPointerException [1.1.2]

Hypothesis: x is undefined

output heap of #12\_iloop\_i<loop1>

Throws: java.lang.NullPointerException.

43: } [1.2]

Conjecture: i^ is greater than or equal to 10

output heap of #12\_iloop\_i<loop1>

stack

No return value.

#12\_iloop\_i<loop1>

40: for(int i=0;i<10;++i){ [1]

hypotheses

Hypothesis: i is greater than or equal to 0

Hypothesis: i is less than length of the array x

Hypothesis: op0 is less than 10

Hypothesis: x is defined

x[i] = 0

i = i + 1

op0 = i + 1

main([I]Z

32: clear(x); [1]

-1: Bad exit [1.2]

-1: catch\_all baseline.ItsAWrap.main([I]Z#1\_invokestatic [1.1]

free choice.1

Hypothesis: x is undefined

-1: throw\_all baseline.ItsAWrap.main([I]Z [1.1.1.2]

output heap of #12\_iloop\_i<loop1>

Throws: java.lang.NullPointerException.

33: if(x[5]==x[6]){ [1.1.1.1]

free choice.2

-1: throw\_all baseline.ItsAWrap.main([I]Z [1.1.2.2]

33: if(x[5]==x[6]){ [1.1.2.1]

-1: #4: ArrayIndexOutOfBoundsException [1.1.2.1.1]

hypotheses

Hypothesis: 5 is greater than or equal to length of the array x

Hypothesis: x is defined

output heap of #12\_iloop\_i<loop1>

Throws: java.lang.ArrayIndexOutOfBoundsException.

-1: #4: NullPointerException [1.1.2.1.2]

Hypothesis: x is undefined

output heap of #12\_iloop\_i<loop1>

Throws: java.lang.NullPointerException.

33: if(x[5]==x[6]){ [1.1.2.1.3]

hypotheses

Hypothesis: 5 is less than length of the array x

Hypothesis: x is defined