**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_iload_i<loop1>
      Throws: java.lang.ArrayIndexOutOfBoundsException.

     -1: #6: NullPointerException [1.1.2]
      Hypothesis: x is undefined
      output heap of #12_iload_i<loop1>
      Throws: java.lang.NullPointerException.

    43: } [1.2]
     Conjecture: i^ is greater than or equal to 10
     output heap of #12_iload_i<loop1>
     stack
     No return value.

   #12_iload_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_iload_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_iload_i<loop1>
        Throws: java.lang.ArrayIndexOutOfBoundsException.

       -1: #4: NullPointerException [1.1.2.1.2]
        Hypothesis: x is undefined
        output heap of #12_iload_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
```

```
-1: #7:
 Hypothe
 output
 Throws:

-1: #7:

33: if(x
 Hypothe

 34: ret
  Conjec
  output
  Return

 36: ret
  Conjec
  output
  Return

free choice
 Hypothesis

 -1: throw_
  output he
  Throws: j

 33: if(x[5
```