M Gmail

Anshuman Dhuliya <anshumandhuliya@gmail.com>

another example
2 messages

Raghavan Komondoor V <raghavan@iisc.ac.in>
Mon, May 13, 2019 at 6:18 PM
To: Anshuman Dhuliya <anshumandhuliya@gmail.com>
Cc: "Uday P. Khedker" <uday@cse.iitb.ac.in>

Anshuman,

Consider the program below.

```
scanf("%d", &b);
scanf("%d", &d);

a = 10;
while (..)
  a = a + 2;
c = 11;
while (..)
  c = c + 2;

if (a <= b) {
 if (b <= c) {
  if (c <= d) {

    if (a >= d)  {
      S; // unreachable
    }
   }
  }
}
```

Say the two analyses to be used are a relational analysis, and odd-even analysis.

I think the only sequence of simplifications that can help detect that S is unreachable is the following sequence:

 1. The relational analysis replaces a >= d with
    (a == b && a == c && a == d && b == c && b == d && c == d)

 2. The odd-even analysis replaces "a == c" above with 0 (i.e., false).

Do you agree with me?

Do you agree that Step 1 above looks quite complicated, although still in the realm of feasibility?

My intuition is that if any property of variables or relationship between variables that is computed by any of the given underlying analyses can be expressed by a syntactic expression, then this combination of analysis can be handled most-precisely using a sequence of simplifications. We could try to prove this, I guess.

Raghavan.

Anshuman Dhuliya <anshumandhuliya@gmail.com>   Tue, May 14, 2019 at 6:47 AM
To: Raghavan Komondoor V <raghavan@iisc.ac.in>
Cc: "Uday P. Khedker" <uday@cse.iitb.ac.in>

Sir,

I agree with you on all the points.

The expressible nature of the data flow information as syntactic constructs has to be the distinguishing
criteria. This has been an intuitive idea lingering in my mind too. The example seems to neatly capture the
idea.

Thanks & Regards,
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