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Examples of problems in code of the Negotiations Model.

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In the following code from subroutine fdred, "dog" on line 1 has a
totally different definition from "dog" on line 2.

```
IF (dog.LE.zpt) THEN
  dog = zero
  GOTO 100
ENDIF
```

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The following lines full of "fox's," "fsh's," and "dog's" show the
cryptic nature of using such variable names. The lines are from
subroutine fdred.

```
fox = amax1(zero, Dclc(6) - Caltv(IM))
fsh = con1*Relm(5)*Days + fox
rmin = amax1(zero, Rel(6) - amax1(fsh, Dmic(5) + Dmic(6) + fox))
fox = amin1(Frd - Flor - Sprel - Qfed, rmin, Stmx(6) - Stor2(6))
fox = amin1(fox, amax1(zero, Rel(7) - Dmic(5) - Dmic(6) - Dmic(7)
&         - Dclc(7)))
fox = amin1(fox, WSURP)
dog = amin1(fox, Surp)
IF (fox.GT.zpt) THEN
```

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Subroutine fdred defines a quantity "bspil" in the following complex
way. Supposedly bspil is a Boca spill that is different from the true
Boca spill, which is the amount that release exceeds demand.

```
rat = amin1(Rspil(7), Rel(7), Stmx(7) + Tcuic(7) + Tmic(7)
&       + Clcrd(7) - Stor2(7))
bspil = amin1(Rel(7), Rspil(7) + rat)
```

However, it turns out that bspil is equal to the true spill, Rspil(7),
99 percent of the time, and half of the other 1 percent results in
incorrect processing--the subroutine shorts water rights. (The other
0.5 percent gets by only by chance.) There should be only one Boca
spill.

The subroutine also defines another variable "test," that is supposedly
somehow different from the true Boca spill. However, test is always,
mathematically, equal to the true Boca spill.

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The zero constraint below, which occurs in subroutine fdred, is an
example of providing reasonable output when the computation is wrong.
For the "EIS with TROA" data set, the two cases (out of 103) that the
first argument is negative are April 1930 and May 1948. The processing
is erroneous for these months. The reduction in flow, wred6, exceeds
the surplus to water rights, Rspil(7), so the subroutine exits shorting
water rights. However, the statement fixes it up so that the spill
from Boca, Rspil(7), seems reasonable, thereby making the output spill
appear reasonable and masking the problem that the reduction actually
cuts into the true release for water rights. (There is no spill left--
that is, a negative spill would be a true reflection of shorting water
rights.)

        Rspil(7) = amax1(Rspil(7) - wred6, zero)

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In the subroutine fdred, if dog.LE.zpt, sometimes an incorrect value of
the Boca spill from input is never corrected. (Recall from the above
that the first "dog" is not the same as the second "dog." For example,
the condition is satisfied for January 1964 (because Boca is full and
cannot accept any more water). However, the Boca release is 11,900
acre-feet, but the water-right demand is zero (there is enough local
inflow downstream to satisfy water rights). Thus, the spill (excess
release over water-right demand) is 11,900 acre-feet. However, the
Boca spill is input to the subroutine as zero and is never reset by the
routine. This causes output errors. For example, without this error
the Tahoe release for September 1983 would be 6,980 acre-feet, but with
it, the Tahoe release for that month would be 6,590 acre-feet, an error
of 6 percent for just this one problem.

        IF (dog.LE.zpt) THEN
           dog = zero
           GOTO 100
        ENDIF

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In subroutine fdred, as stated above, the Boca spill bspil should be
just the true spill. As indicated, most of the time that happens
anyway. One of the years it doesn't is July 1930. That causes
incorrect processing, and affects the Stampede cui-ui storage, as
indicated in the next graph.

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