

Jean-Michel Muller's Example

From his forthcoming book ARITHMETIQUE DES ORDINATEURS :

$$a_0 := 11/2$$

$$a_1 := 61/11$$

$$a_{n+1} := 111 - (1130 - 3000/a_{n-1})/a_n$$

This should generate a sequence $\{a_n\}$ that converges slowly to 6, but when computed in floating-point on any computer using only finite precision the computed sequence converges rapidly to 100 instead.

W. K.'s example:

An example of a singularity removable numerically only if the computer's arithmetic carries a guard digit in subtraction:

```
Real function f(real z) :=
  if z < 0 or z > 1 then 0/0
  else if z = 1 then -0.5
  else arctan(ln(z))/arccos(z)2.
```

The function has a power series expansion near $z = 1$:

$$f(z) = -0.5 + (z-1)/6 - (z-1)^2/20 - 124(z-1)^3/945 + \dots$$