

```

=> # a procedure with 4 inputs
=> rs := proc(a1, a2, c, d :: integer)
description " a1 is first value in sequence and a2 is second."
  local cf;
  # cf is for closed form
  cf := rsolve( {a(1) = a1, a(2) = a2, a(n) = c·a(n - 1) + d·a(n - 2)}, a(k))
  end proc
rs := proc(a1, a2, c, d::integer)
  local cf;
  description " a1 is first value in sequence and a2 is second.";
  cf := rsolve( {a(1) = a1, a(2) = a2, a(n) = c * a(n - 1) + d * a(n - 2)}, a(k))
end proc
=> # this procedure may not match up with the other one.
=> # now to try it out
=> s1 := rs(1, 2, 1, 1);
      
$$s1 := \left( \frac{1}{10} \sqrt{5} + \frac{1}{2} \right) \left( \frac{1}{2} + \frac{1}{2} \sqrt{5} \right)^k + \left( -\frac{1}{10} \sqrt{5} + \frac{1}{2} \right) \left( \frac{1}{2} - \frac{1}{2} \sqrt{5} \right)^k$$

=> # good old Fibonacci
=> seq(round(s1), k = 1 ..18);
      1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181
=> s2 := rs(1, 2, 1, 3);
      
$$s2 := \left( -\frac{5}{78} \sqrt{13} + \frac{1}{6} \right) \left( \frac{1}{2} - \frac{1}{2} \sqrt{13} \right)^k + \left( \frac{5}{78} \sqrt{13} + \frac{1}{6} \right) \left( \frac{1}{2} + \frac{1}{2} \sqrt{13} \right)^k$$

=> seq(round(s2), k = 1 ..18);
      1, 2, 5, 11, 26, 59, 137, 314, 725, 1667, 3842, 8843, 20369, 46898, 108005, 248699, 572714,
      1318811
=> # I should look that one up... it is oeis.org slash A006138
=>

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(1)

(2)

(3)

(4)

(5)