REKURENSH RELAYSHIONS VOOZING PHORMULAY

1. Linear homogenous RR with constant coeff.

$f_n = f_{n-1} + f_{n-2}$ $\quad +2$

↳ not homogenous.

homogenous

order

$t^2 = t^1 + 1$

$t^2 - t - 1 = 0$ ___ character istic eqn.

$t = \frac{\sqrt{5}+1}{2}$ $\quad a = \frac{\sqrt{5}+1}{2}$

$b = \frac{\sqrt{5}-1}{2}$

$f_n = \alpha_1 a^n + \alpha_2 b^n$?

$a = b$

$\Rightarrow f_n = \alpha_1 a^n + \alpha_2 n a^n$

$f_0 = 0 \quad f_1 = 1$

$0 = \alpha_1 + \alpha_2$

$1 = \alpha_1 \left(\frac{\sqrt{5}+1}{2}\right) + \alpha_2 \left(\frac{\sqrt{5}-1}{2}\right)$

Solve for α_1 and α_2.

Linear non-homogenous RR.

$$a_n = \alpha_1 a_{n-1} + \alpha_2 a_{n-2} + F(n)$$

$$a_n = 3a_{n-1} + \underbrace{2n}_{F(n)}$$

let $a_n = cn + d$

$$a_n = a_2 + a$$

RRs can be split.

$$a_n = (3c(n-1) + d) + 2n$$

$$= (3cn - 3c + d) + 2n$$

$$(2 + 2c)n + (2d - 3c) = 0$$

$c = -1$ $\quad d = -3/2$

$$a_n = n - \frac{3}{2}\alpha$$

$$a_n = \alpha 3^n$$