$$T(n) = 7T(n-1) - 15T(n-2) + 9T(n-3) + \boxed{4 \times 3^n} + \boxed{8}$$

$$r^3 - 7r^2 + 15r - 9 = 0$$

$$r = 3, 3, 1$$

$$(x-y)^n = \sum_{j=0}^{n} C(n,j) x^{n-j} y^j$$

$$T(n) = T^b(n) + T^p(n)$$

$$\boxed{T(n)^b = (A + Bn)3^n + C1^n}$$

1

1 2 1

$$T^p(n) = Dn^2 3^n + nE$$

$$Dn^2 3^n + nE = 7\left(D(n-1)^2 3^{n-1} + (n-1)E\right)$$
$$-15\left(D(n-2)^2 3^{n-2} + (n-2)E\right) +$$
$$9\left(D(n-3)^2 3^{n-3} + (n-3)E\right) + 4 \times 3^n + 8$$

$$Dn^2 3^n + nE = 7\left(\frac{D(n^2-2n+1)3^n}{3} + (n-1)E\right)$$

$$-15\left(\frac{D(n^2-4n+4)3^n}{9} + (n-2)E\right) +$$

$$9\left(\frac{D(n^2-6n+9)3^n}{27} + (n-3)E\right) + 4 \times 3^n + 8$$

$n^2 3^n$ | $D = \frac{7}{3}D - \frac{15D}{9} + \frac{9D}{27} \Rightarrow \frac{63}{27} - \frac{45}{27} + \frac{9}{27} = \frac{27}{27}$

$D = D$ ✓

$n 3^n$ | $0 = -\frac{14}{3}D + \frac{60}{9}D - \frac{54}{27}D \Rightarrow -\frac{126}{27} + \frac{180}{27} - \frac{54}{27} = 0$

$0 = 0$ ✓

3^n

$$0 = \frac{7D}{3} - \overset{-20/3}{\cancel{\frac{60D}{9}}} + \overset{\cancel{27/9}\ \ 9/3}{\cancel{\frac{81}{27}}}D + 4$$

$$0 = -\frac{4}{3}D + 4 \qquad -\frac{4}{3}D = -4 \qquad \boxed{D = 3}$$

n

$$E = 7E - 15E + 9E \qquad E = E \checkmark$$

cte

$$0 = -7E + 30E - 27E + 8$$

$$0 = -4E + 8 \qquad \boxed{E = 2}$$

$$T(n) = (An + B)3^n + C + 3n^2 3^n + 2n$$

$T(0) = 4$

$T(1) = 16$

$T(2) = 32$

$n=0 \quad 4 = B + C$

$n=1 \quad 12 = (A+B)3 + C + 9 + 2$

$n=2 \quad 32 = (2A + B)9 + C + 108 + 4$

$$\boxed{\begin{aligned} 4 &= B + C \\ 1 &= 3A + 3B + C \\ -80 &= 18A + 9B + C \end{aligned}}$$

[Fraction(-32, 3), Fraction(27, 2), Fraction(-19, 2)]

A B C

$$\boxed{T(n) = \left(-12n + \frac{33}{2}\right)3^n - \frac{25}{2} + \frac{9}{4}n^2 3^n + 2n}$$

$$(r-2)^2 = r^2 - 4r + 4$$

$T(0) = 10$

$T(1) = 20$

$$T(n) = 4T(n-1) - 4T(n-2) + n2^n + 4\times(-2)^n$$

$$\boxed{T^{(h)} = (An + B)2^n}$$ homogenea

$$\boxed{T^{(p)}(n) = n^2(Cn + D)2^n + E(-2)^n}$$ Particular

$$n^2(Cn + D)2^n + E(-2)^n = 4\left(\frac{(n-1)(C(n-1)+D)2^n}{2} + \frac{E(-2)^n}{-2}\right)$$

$n^3 2^n$ cte

$n^2 2^n$

$n 2^n$

2^n

$$-4\left(\frac{(n-2)(C(n-2)+D)2^n}{4} + \frac{E(-2)^n}{4}\right)$$

$$+ n2^n + 4(-2)^n$$

$$T(n) = 2T(n-1) - T(n-2) + 2n^2+4 \qquad (r-1)^2 = r^2-2r+1$$

1) E.C $\quad r^2-2r+1=0$

2) Forma general homogena $\quad T(n) = (An+B)\times 1^n = (An+B)$

3) Forma solución particular

$$T^p(n) = (Cn^2+Dn+E)\,n^2$$

$$Cn^4+Dn^3+En^2 = 2\left(C(n-1)^4+D(n-1)^3+E(n-1)^2\right)$$
$$-\left(C(n-2)^4+D(n-2)^3+E(n-2)^2\right)$$
$$+2n^2+4$$

n^4

n^3

n^2

n

ctr

$$T(n) = 4T(n/2) - 4T(n/4) + n + 5$$

$(r-2)$

$\frac{2^n}{2} = 2^{n-1}$

$r^2 - 4r + 4$

$n = 2^k$

2^2

$T(1) = 4$

$$T(2^k) = 4T\left(\frac{2^k}{2}\right) - 4T\left(\frac{2^k}{2^2}\right) + 2^k + 5$$

$T(2) = 8$

$$T(2^k) = 4T(2^{k-1}) - 4T(2^{k-2}) + 2^k + 5$$

$T(2^k) = T_k$

$$\boxed{T_k = 4T_{k-1} - 4T_{k-2} + 2^k + 5}$$

$$T_k = T_k^{(h)} + T_k^{(p)} \qquad r^2 - 4r + 4 = 0$$

$$T_k^{(h)} = (A + Bk)\,2^k$$

$$T_k^{(p)} = C + k^2 D\, 2^k$$

$$C + k^2 D\, 2^k = 4\left(C + (k-1)^2 D\, 2^{k-1}\right) - 4\left(C + (k-2)^2 D\, 2^{k-2}\right) + 2^k + 5$$

$$\cancel{C} + \cancel{k^2 D\, 2^k} = 4\left(C + (\cancel{k^2} - \underset{2}{\cancel{2}}k + 1) D\, 2^{k-1}\right)$$

$$= 4\left(C + \frac{(k^2 - 4k + 4)D2^k}{4}\right) + 2^k + S$$

$k^2 2^k$	$D = 2D - D$	$D = D$
$k 2^k$	$0 = -4D + 4D$	$0 = 0$
2^k	$0 = 2D - 4D + 1$	$2D = 1$ $\quad \boxed{D = \frac{1}{2}}$
cte	$C = 4C - 4C + S$	$\boxed{C = S}$

$$\boxed{T_k = (A + Bk)2^k + S + \frac{1}{2}k^2 2^k}$$

$n = 2^K \qquad K = \log_2(n)$

$$T(n) = (A + B\log_2(n))2^{\log_2(n)} + S + \frac{1}{2}(\log_2(n))^2 2^{\log_2(n)}$$

$$A^{\log_2(n)} = n^{\log(A)}$$

$$T(n) = (A + B\log_2(n))n^{\log_2(2)} + S + \frac{1}{2}(\log_2(n))^2 n^{\log_2(2)}$$

$$T(n) = (A + B\log_2(n))n + S + \frac{1}{2}((\log_2(n))^2 n$$

$$O((\log_2(n))^2 n)$$

$T(1) = 4 \qquad 4 = A + 5 \qquad \boxed{A = -1}$

$T(2) = 6 \qquad 6 = (-1 + B)\,2 + 5 + \frac{1}{2}\,2$

$$6 = -2 + 2B + 5 + 1$$

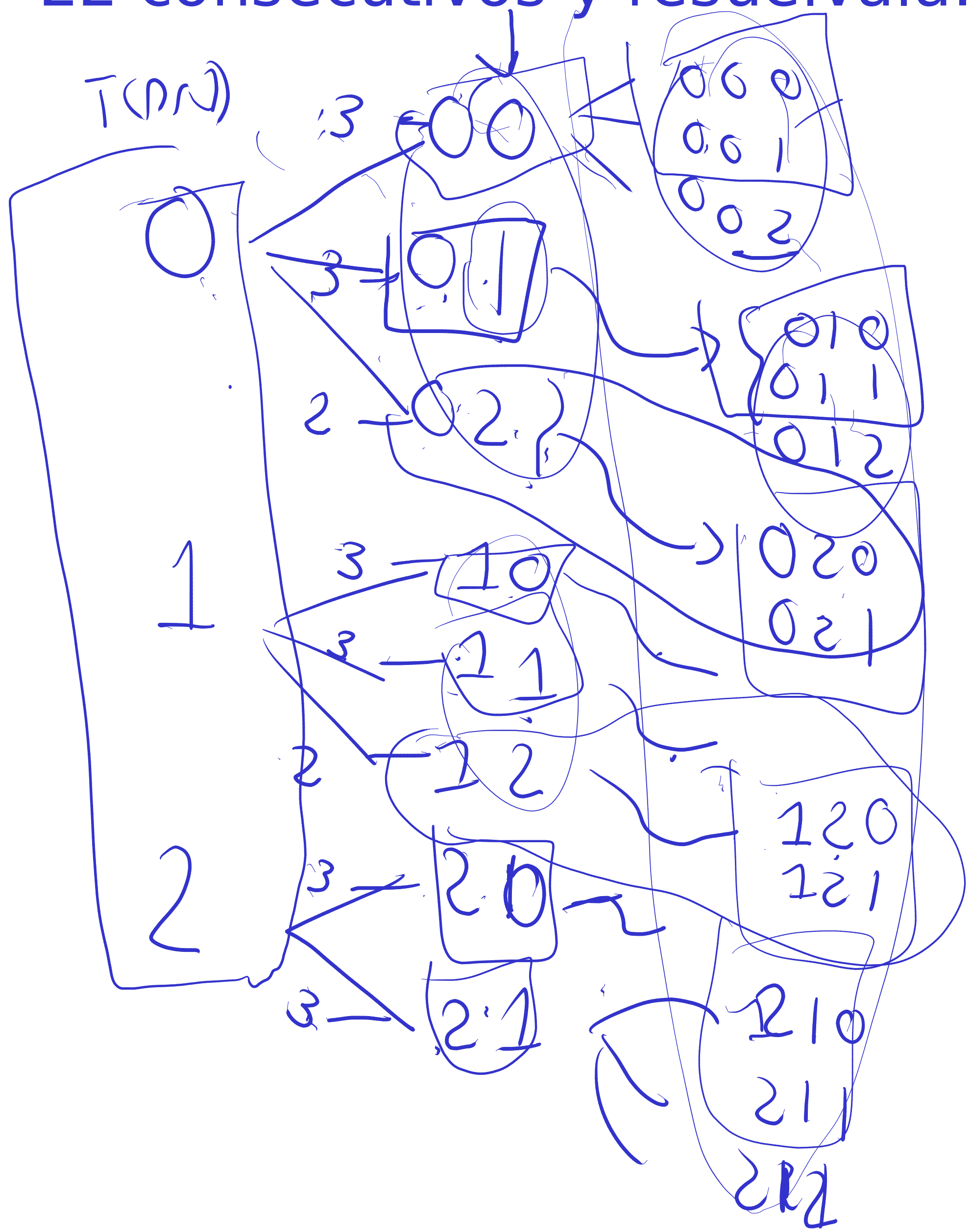
$$\boxed{B = 1}$$

$$\boxed{T(n) = (-1 + \log_2(n))\,n + 5 + \frac{1}{2}((\log_2(n)))^2\,n}$$

100%

$$\log_9(6) = \frac{\log_2(6)}{\log_2(9)} \qquad \log_7(49) = \frac{\log_2(49)}{\log_2(7)}$$

Indique la RR que describa las cadenas en base3 que no tenga 22 consecutivos y resuelvala.



$$\boxed{T(n) = 2T(n-1) + 3T(n-2)}$$

$T(1) = 2$

$T(2) = 8$

$T(3) = 2 \times 8 + 3 \times 2 = 22$

$3+3+2+3+3+2+3+3 = 22$

$r^2 - 2r - 3 = 0$