HW | HW1

3 | 1

$$x_n = x_{n-1} + 2x_{n-2} - x_{n-3}$$

n	x_n
0	$x_0 = 1$
1	$x_1 = 2$
2	$x_2 = -1$
3	$x_3 = x_2 + 2x_1 - x_0 = -1 + 2(2) - 1 = 2$
4	$x_4 = x_3 + 2x_2 - x_1 = 2 + 2(-1) - 2 = -2$
5	$x_5 = x_4 + 2(x_3) - x_2 = -2 + 2(2) - -1 = 3$

2

$x_n = 5x_{n-1} - 6x_{n-2}$ $\quad x_0 = 0$, $x_1 = 1$

$z^2 = 5z - 6$

$z^2 - 5z + 6 = 0$

$(z-2)(z-3)$ $\quad z_1 = 2$, $z_2 = 3$

$x_n = C_1 2^n + C_2(-3)^n$

$x_0 = 0 = C_1 + C_2$

$x_1 = 1 = 2C_1 - 3C_2$

$1 = 5C_1$

$C_1 = 1/5$

$C_2 = -1/5$

$$x_n = 1/5\,(2^n) - 1/5\,(-3)^n$$

HW1

3

P_1 , P_2

ONLY 1 & 2 YR OLDS FERTILE, SO TOTAL FEMALES BORN IS SUM OF 1 & 2 YR OLDS × PROBABILITY OF FEMALE BIRTH

n	Pop (x)
0	C_0
1	C_1
2	$P_1 \cdot C_0 + P_2 \cdot C_1$
3	$x_3 = x_2 \cdot P_1 + P_2 \cdot x_1 =$ $P_1^2 C_0 + P_1 P_2 C_1 + P_2 C_1$
4	$x_4 = x_3 \cdot P_1 + P_2 \cdot x_2$

$$x_n = P_1 \cdot x_{n-1} + P_2 \cdot x_{n-2}$$

$$x_4 = P_1(P_1^2 C_0 + P_1 P_2 C_1 + P_2 C_1) + P_2(P_1 C_0 + P_2 C_1)$$

$$\boxed{x_4 = P_1^3 C_0 + P_1^2 P_2 C_1 + P_1 P_2 C_1 + P_2 P_1 C_0 + P_2^2 C_1}$$