

Practice 3

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● Definition equation model

$$x_1(t_{k+1}) = \sum_{i=1}^n b_i x_i(t_k)$$

$$x_2(t_{k+1}) = p_1 \bullet x_1(t_k)$$

$$x_i(t_{k+1}) = p_{i-1} \bullet x_{i-1}(t_k)$$

● Table of all state variables of the model with columns

$x_i(t_k)$
The number of individuals in the age group i at the time k
$x_1(0) = 1494370; x_2(0) = 2075652; x_3(0) = 2474329; x_4(0) = 2142379; x_5(0) = 1626214;$ $x_6(0) = 665283; x_7(0) = 28586$
individuals

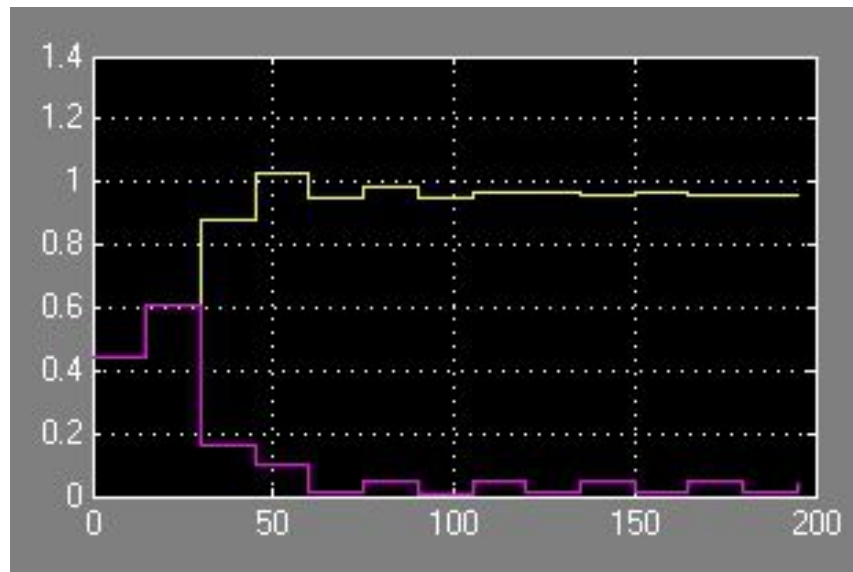
● Table of all model parameters:

b_i	p_i
Birth rate of age group i	Probability of age group i
$b_1 = 0;$ $b_2 = (26.67422/1000) * 15;$ $b_3 = (23.029775/1000) * 15;$ $b_4 = (0.0380419/1000) * 15;$ $b_5 = 0;$ $b_6 = 0;$ $b_7 = 0;$	$p_1 = (1 - 0.822164/1000)^{15};$ $p_2 = (1 - 0.465078/1000)^{15};$ $p_3 = (1 - 1.16375/1000)^{15};$ $p_4 = (1 - 5.48891/1000)^{15};$ $p_5 = (1 - 21.34731/1000)^{15};$ $p_6 = (1 - 21.34731/1000)^{15};$ $p_7 = 0$
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● Table of all model parameters with a modified birth rate:

Modified birth rate
$b_1 = 0;$ $b_2 = (26.67422/1000) * 15 + 0.25 * 15;$ $b_3 = (23.029775/1000) * 15 + 0.25 * 15;$ $b_4 = (0.0380419/1000) * 15 + 0.25 * 15;$ $b_5 = 0;$ $b_6 = 0;$ $b_7 = 0;$
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- Graphical representation



Maximum limit of the ratio:

Original model:45-60 year

Modified model:15-30 year

Overall population

