Practice 7

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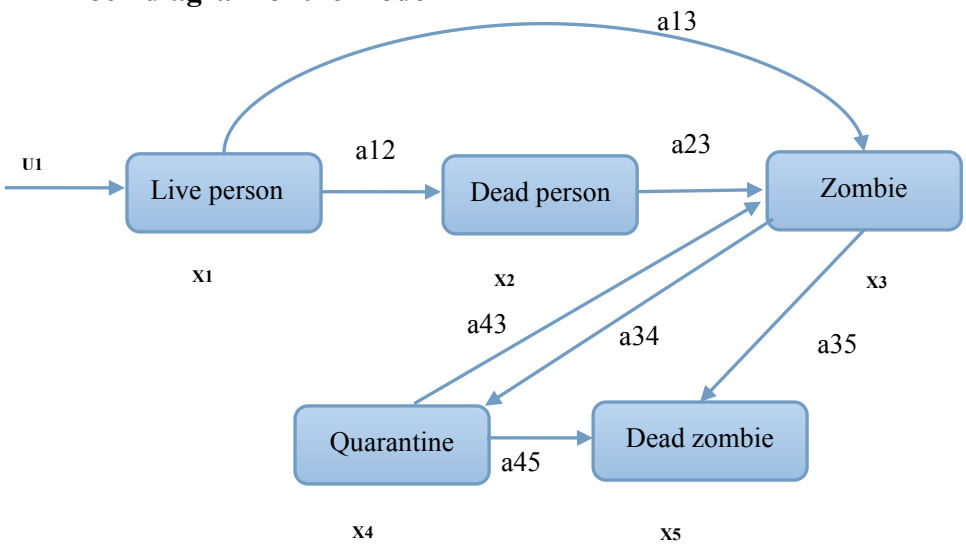
- **Definition equation model**

$$Q'_k(t) = \sum_{i=1}^{n} k_{iq(k)} u_i(t) + \sum_{\substack{j=1 \\ j\neq k}}^{k} k_{jk} Q_j(t) - \sum_{\substack{j=1 \\ j\neq k}}^{k} k_{kj} Q_k(t) - \sum_{i=1}^{m} k_{q(k)i} Q_k(t)$$

- **Block diagram of the model**



- **State equations of model**

$$\dot{X}1 = U1 - X1 * a12 - X1 * a13$$

$$\dot{X}2 = X1 * a12 - X2 * a23$$

$$\dot{X}3 = X1 * a13 + X2 * a23 + X4 * a43 - X3 * a34 - X3 * a35$$

$$\dot{X}4 = X3 * a34 - X4 * a43 - X4 * a45$$

$$\dot{X}5 = X3 * a34 + X4 * a45$$

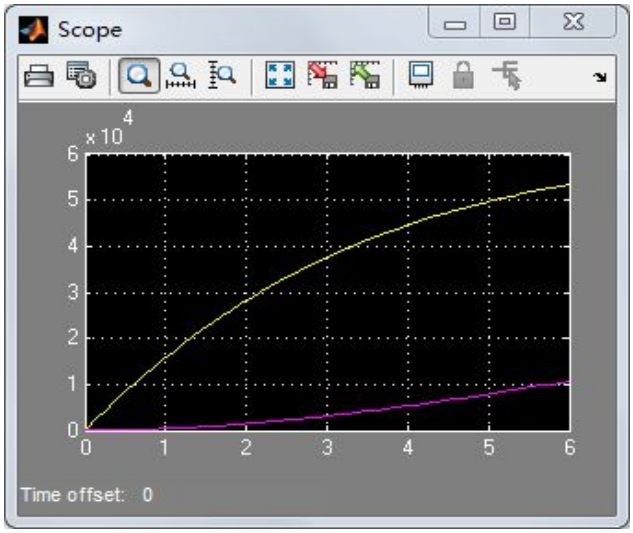
- **Table of all state variables of the model with columns**

X1	X2	X3	X4	X5
Live person	**Dead person**	**Zombie**	**Quarantine**	**Dead zombie**
$X1(0) = 300000$	$X2(0) = 0$	$X3(0) = 1$	$X4(0) = 0$	$X5(0) = 0$
individuals	**individuals**	**individuals**	**individuals**	**individuals**

- **Table of all model parameters:**

U1	a12	a13	a23	a34	a35	a43	a45
New residents	Rate of people die of natural cause	Rate of live person become zombie	Rate of dead person become zombie	Rate of zombie closed in quarantine	Rate of zombie destroyed by people	Rate of zombie escape from quarantine	Rate of zombie die in quarantine
20000/365	0.06	1/7	0.045	0.01	0.02	1/68	1/30
individuals	\.	\.	\.	\.	\.	\.	\.

- **Graphical output of simulations with the labeled number of dead zombie after 6 days.**



- **Graphical output of verifying the correctness of equations**