(HW #1) Due 04/07/16

3. annual = discrete population growth
$\lambda = 1 + 0.12 = 1.12$

example population:
$N_0 = 2$
$N_T = 4$
$\lambda = 1.12$
$T = ?$

$N_T = \lambda^T N_0$
$4 = (1.12)^T 2$
$2 = (1.12)^T$
$\log 2 = T \cdot \log(1.12)$
$T = \frac{\log 2}{\log(1.12)} =$ 6.12 years doubling time

4. Human population growth is density independent, so the birth and death rate do not depend on population size. I think this because most of the deaths in our area are not a factor of the population size but due to other things such as cancer or aging. Three things that could make this density dependent might be the introduction of a pathogen, competition between community members and potential introduced of a predator with humans as its prey.

5. I chose dogs and think that they would be modeled using a continuous framework. They have the ability to reproduce more than once a year and are likely density independent.