

The predator prey system below has a term for the carrying capacity of the prey species. Initially the prey population $N(0) = 330$ and the predator population $P(0) = 270$.

$$\begin{aligned}\frac{dN}{dt} &= 0.07N(700 - N) - 0.05NP \\ \frac{dP}{dt} &= 0.04PN - 4P\end{aligned}$$

- (a) In the absence of predators, what is the carrying capacity of the prey's environment?
- (b) Use a step size of $\Delta t = 0.05$ and Euler's method, to model the population numbers over the next 5 years.
- (c)
 - i. Plot prey and predator populations versus time on one graph.
 - ii. Plot Prey population size versus predator population size.
 - iii. Do the results suggest a stable situation develops in time?