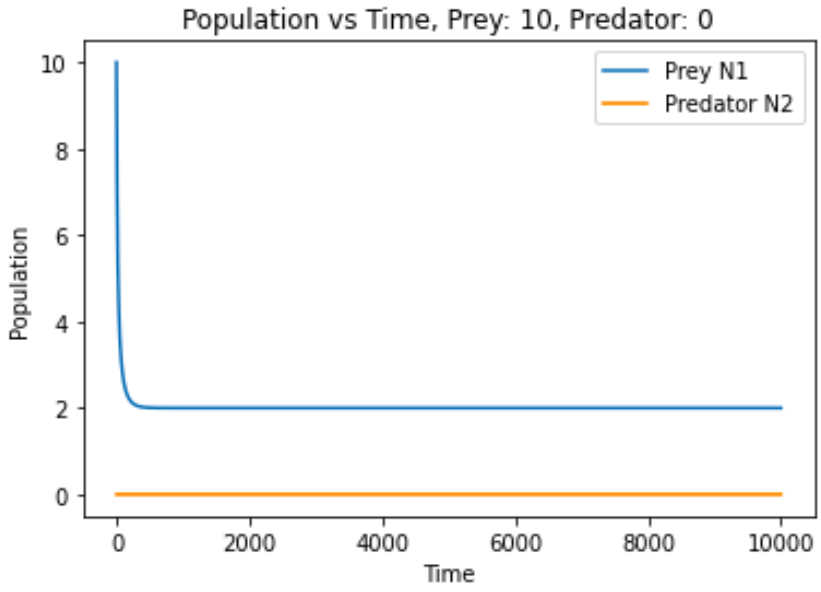
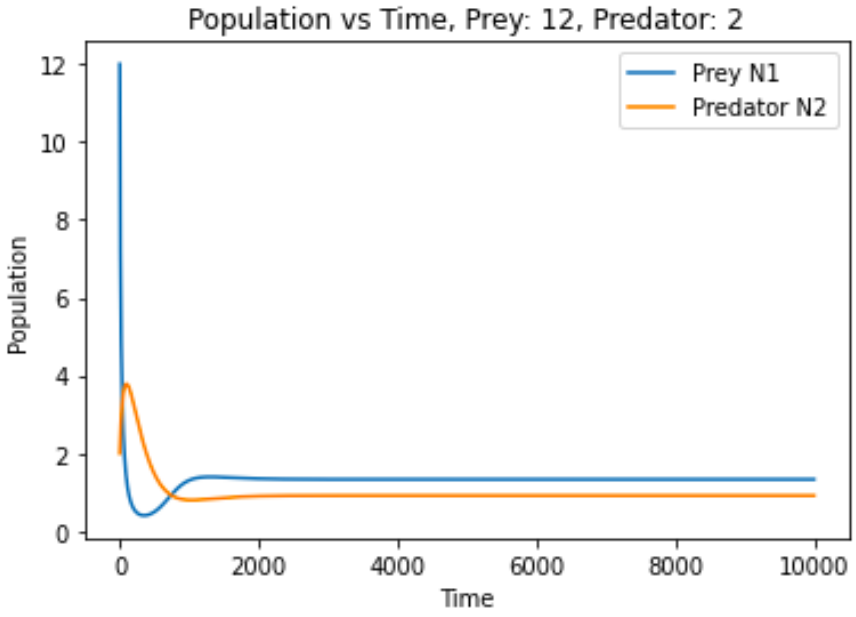
Constants

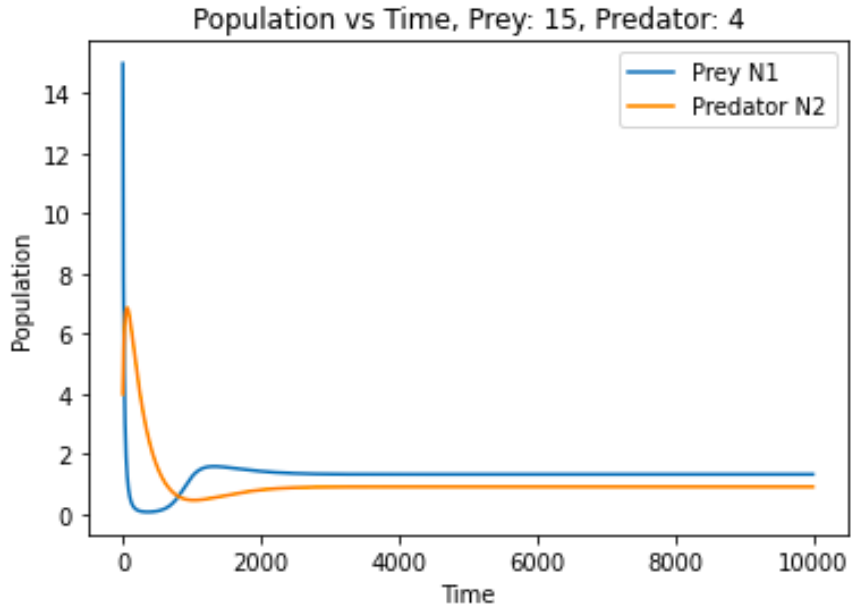
```
r = 1.1
alpha = 0.4
c = 0.4
beta = 0.3
k = 2
```

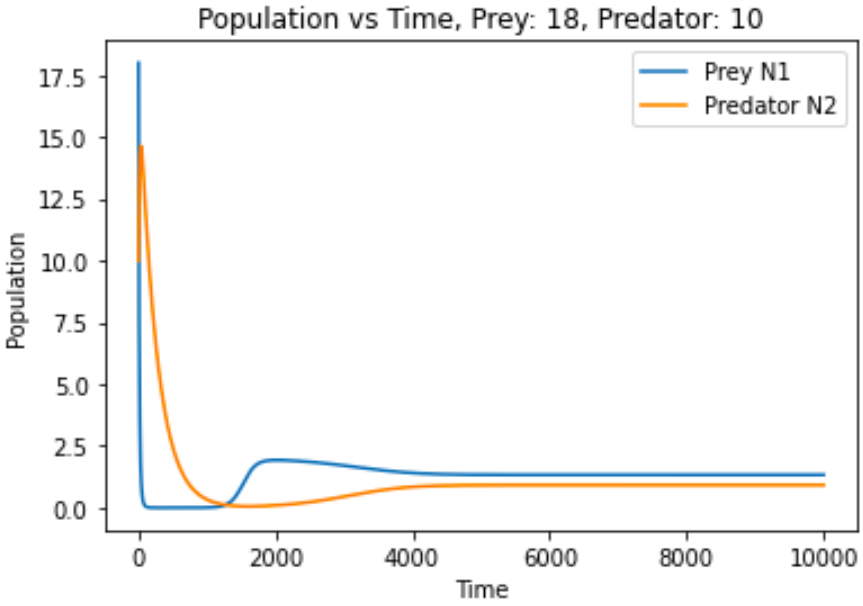
Plots



If number of predators is 0, then the prey population stabilizes at k.

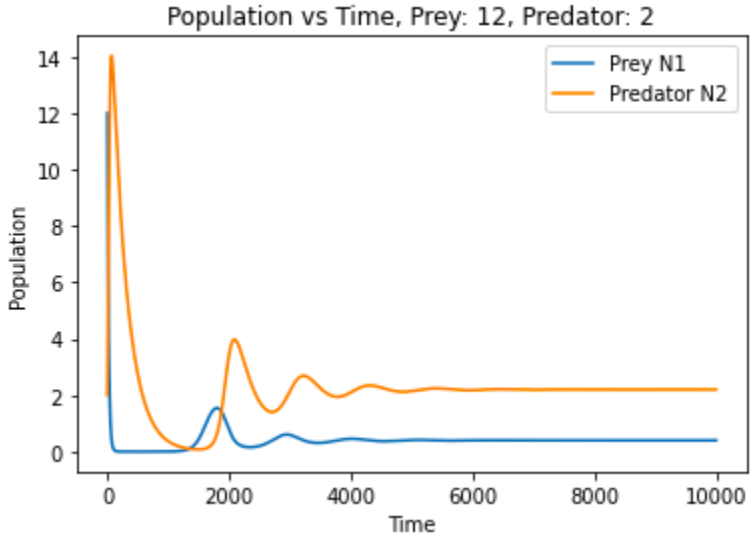

Population vs Time, Prey: 12, Predator: 2
Prey N1
Predator N2
Population
Time
0
2
4
6
8
10
12
0
2000
4000
6000
8000
10000

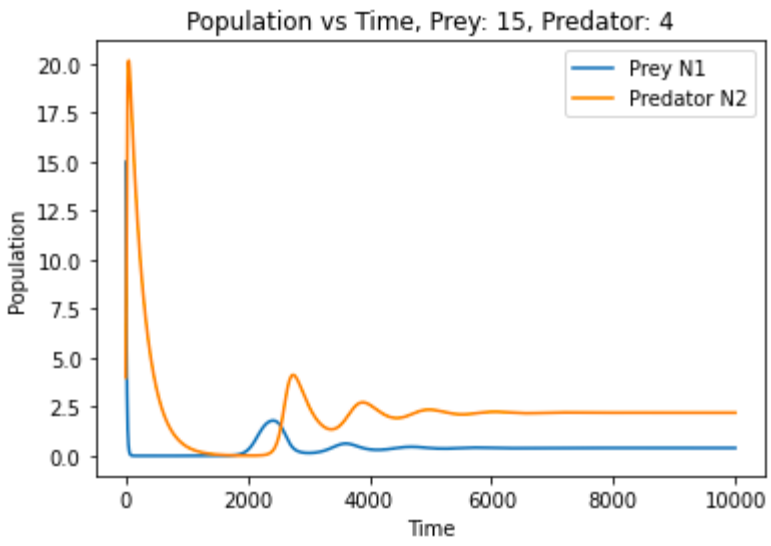

Population vs Time, Prey: 15, Predator: 4
Prey N1
Predator N2
Population
Time
0
2
4
6
8
10
12
14
0
2000
4000
6000
8000
10000



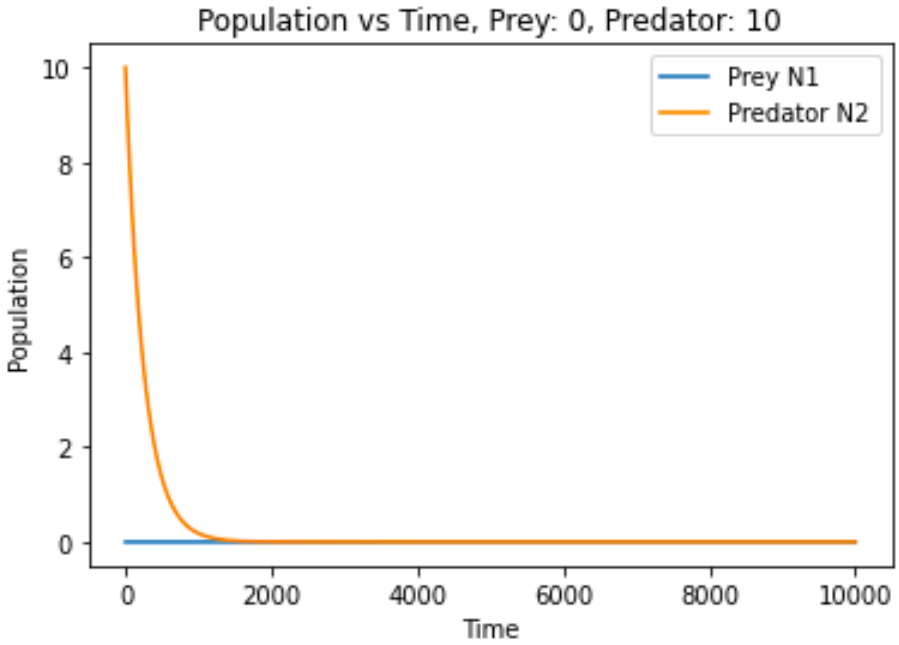
Constants

```
r = 1.1
alpha = 0.4
c = 0.4
beta = 1
k = 2
```





We observe that the predator population first rises due to abundance of prey then has a sharp drop as the prey number reduces a lot. Then both the populations steadily grow and become stable after some time at which equilibrium is achieved. However, if the growth rate of the predator is more than the death rate of the predator, the final stable predator population is greater in number than the prey population.



If prey population is 0 then the predator population decreases exponentially.