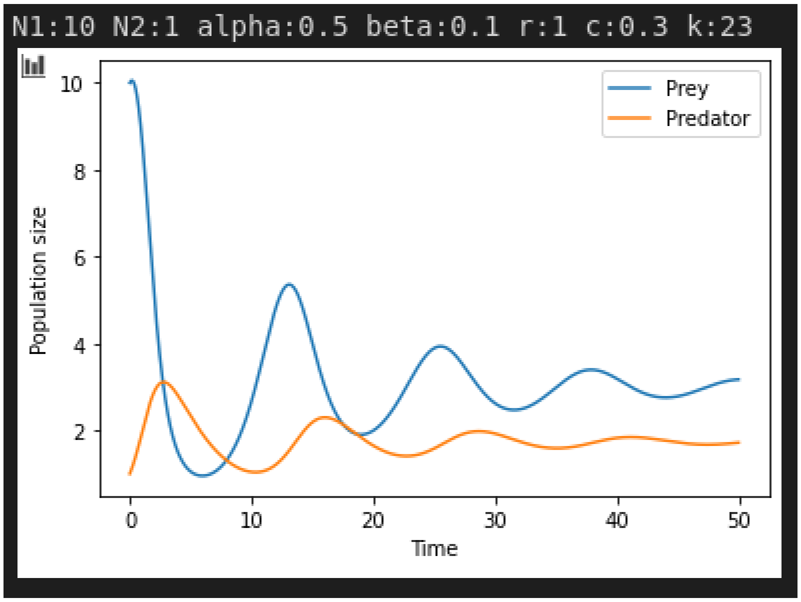
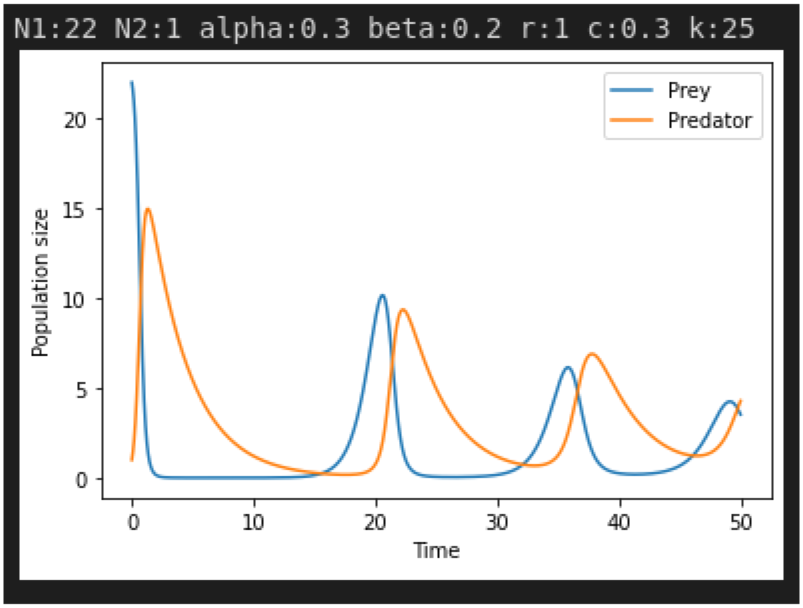
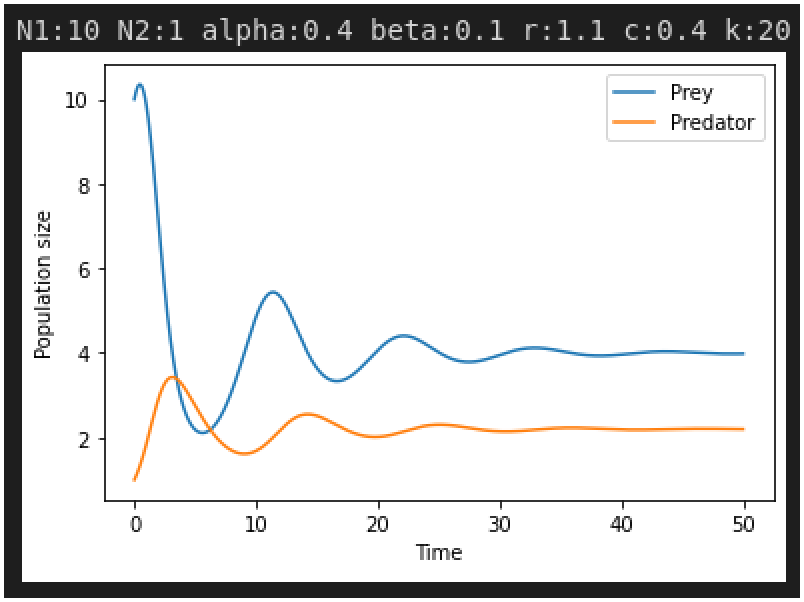
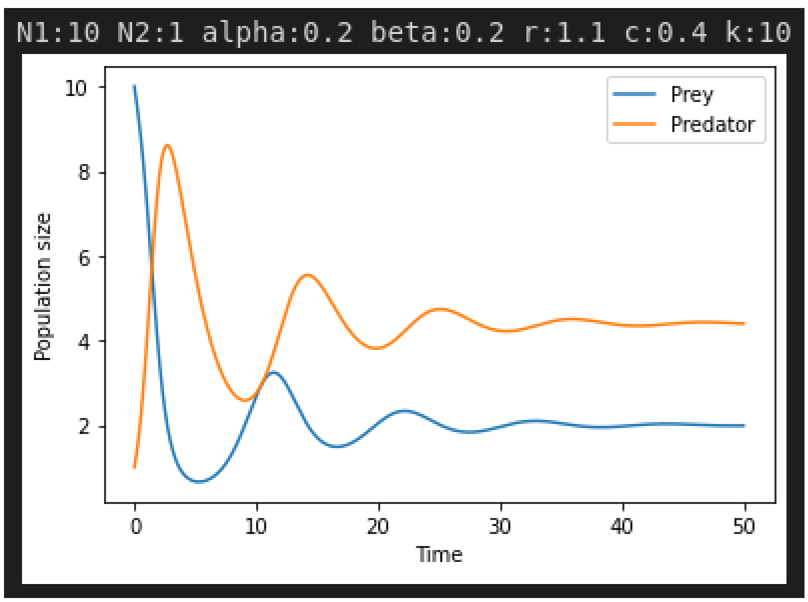
Report - 8

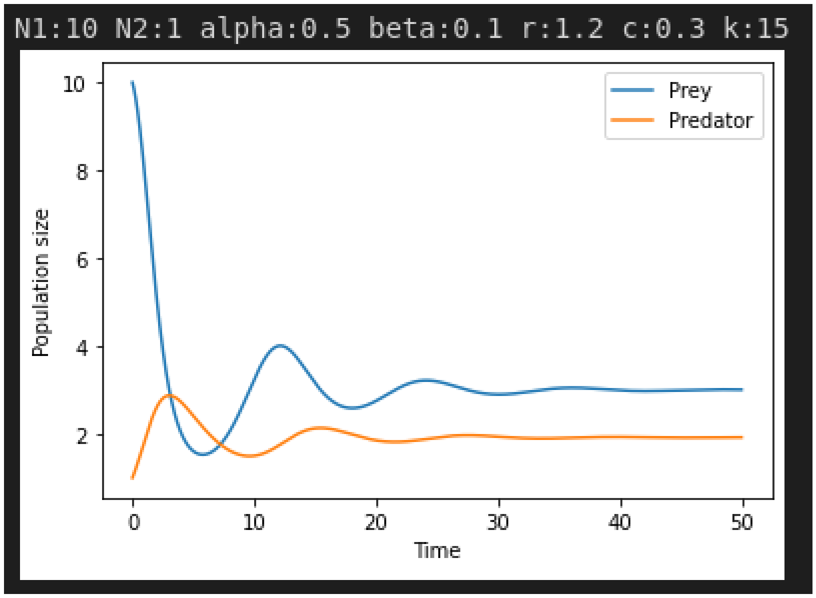
Graphs for different starting conditions:






N1:10 N2:1 alpha:0.4 beta:0.1 r:1.1 c:0.4 k:20
Prey
Predator
Population size
Time
0
10
20
30
40
50
2
4
6
8
10


N1:10 N2:1 alpha:0.2 beta:0.2 r:1.1 c:0.4 k:10
Prey
Predator
Population size
Time
0
10
20
30
40
50
2
4
6
8
10



As we can see, the peak of the predator always follows the peak of the prey curve. This is because as the prey population increases, the predator population also increases and when there is a food shortage for the predators (the prey curve starts falling), the predators also start dying. Additionally the curves always drop off eventually and reach an equilibrium point. This is the population sizes for which the rate of death and growth of both species are equal to each other, and hence there is no net change to the population size. In some cases the population of the predators is higher than that of the prey, but this is due to the parameters and wouldn't be observed in nature.