Observations regarding the nature of trajectory

We can observe early stable N_1 - N_2 equilibrium if β is small enoughi.e. β < 10^{-4}>. For example `Figure_1` .

We can observe that for less value of α, the difference bwteen number of prey & predators is more as compared to those in higher α-value before convergence.

We can observe $N_2 \to 0$ if β too large where β=0.8 . For example `Figure_3`

The growth trajectories seem to follow the rationale that More Prey ⟹ More Predator ⟹ Less Prey ⟹ Less Predator ⟹ More Prey

This reasoning yields two oscialltory curves describing the two species, with the prey population curve leading to the predator population curve, as seen in the map.

The populations' trajectories are therefore convergent, meaning that the amplitudes of the oscillations seem to decrease as time progresses. This is a direct result of the logistical essence of the prey population's development.

We can observe in `Figure_4` that when `r=1` that means prey grows logistically with intrinsic growth rate of 1, the predator consumes all the preys & get almost extinct , then again preys grow in number & predator consumes them & so on infinite cycle.

Different Values used to run code:

```
initial_N1 =  [20, 20, 20,  10]
initial_N2 =  [5, 5, 5, 3]
initial_r = [1.5, 2.1, 2.5, 1]
initial_α = [0.2, 0.27, 0.8,  0.8]
initial_β = [0.0001, 0.15, 0.8, 0.8]
initial_c = [0.4, 0.5, 0.45,  0.45]
initial_k = [20, 25, 25, 25]
initial_t = [100, 100, 100, 100]
initial_i = [500, 500 ,500, 500]
```