# Programming practice II
Functions

Question 2. The prey-predator model (捕食-被食モデル):

Background: The prey-predator model is a set of two functions that describe the evolution in time of two populations, a *prey* and its *predator* — a rabbit and a fox, for example. It is also known as the Lotka-Volterra model (ロトカ・ヴォルテラのモデル), after the name of two scientists who studied this problem in the early 20th century. In its discrete version, the system has three attractors: a state where both populations have become extinct; a state where the predator is extinct and the prey population is high; and a cycle where the two populations oscillate.
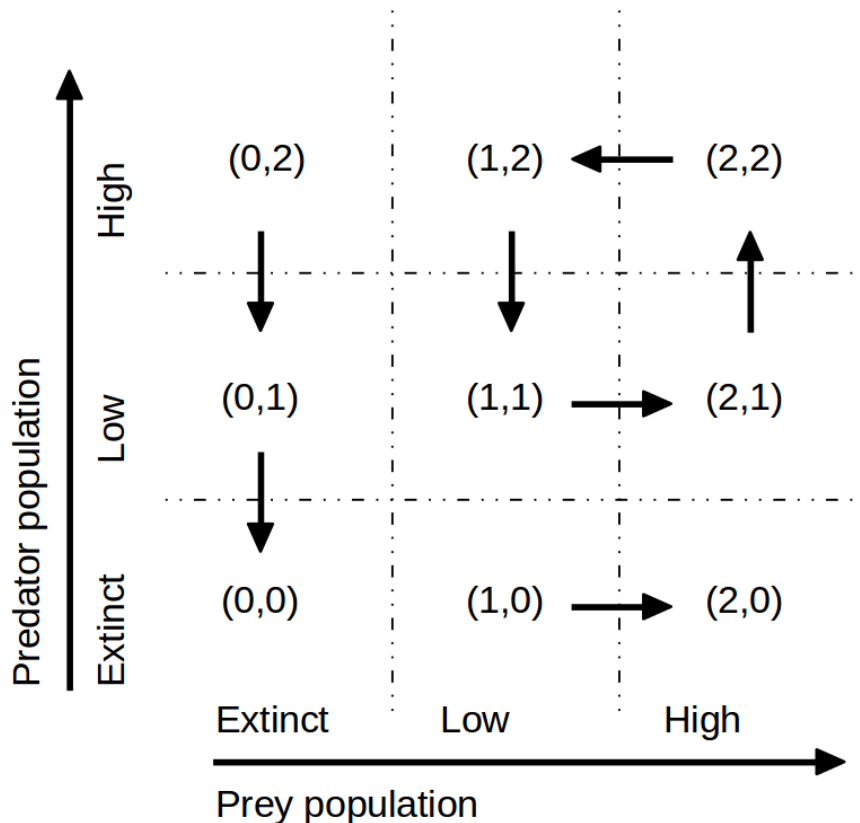
Problem: Write a program to simulate the evolution of this system.
- Use *discrete* variables (integers) to represent population levels: 0: extinct, 1:low, 2:high.
- Write separate functions to calculate the next level of the prey and predator populations based on their current levels.
- Simulate the system step by step, until it reaches a state that has already been visited.
- At the end, the step number of the last state should be the same as that of the previously visited identical state.

Example:

```
$ ./prog3-2
Enter prey, predator: 0 2
step 0      prey: 0      predator: 2
step 1      prey: 0      predator: 1
step 2      prey: 0      predator: 0
step 2      prey: 0      predator: 0
```

Vocabulary:

prey /preɪ/ 被食者
predator /ˈprɛdətɚ, -ˌtɔr/ 捕食者
evolution /ˌɛvəˈluʃən; esp. Brit. ˌivə-/ 発展
population /ˌpɑpyəˈleɪʃən/ 集団
species /ˈspiʃiz, -siz/ 種
rabbit /ˈræbɪt/ ウサギ
fox /fɑks/ キツネ
extinct /ɪkˈstɪŋkt/ 絶滅した
state /ˈsteɪt/ 状態
oscillate /ˈɑsəˌleɪt/ 振動する