Notes for Week 3 Lab Section

* Housekeeping time:

1. Assignment 3 has been posted on both websites and feel free to send me questions; submit your answers through NTU cool by our next class
2. The link to the recorded lecture will be available on NTU cool soon after the class
3. I will grade your assignment 2 as soon as possible.
4. By the way, if you submit it earlier than I would grade it earlier and so you can bring your questions during the next class and discuss with Prof. Ke and I. This is an added benefit of the early bird submission.
5. Also I have released the suggested solutions to the assignment 2 on the course website. Just note that they are not the absolute solutions and your assignments will not be graded solely based on them. You can get full marks for the questions as long as your answers are correct.

* Lab section:

1. Feel free to stop me anytime if you have questions or I’m not clear and you want to hear again. You can type your questions in the message box too and I’ll check it out during the question breaks.
2. Code explanation Part 1: solving the differential equation for logistic population growth numerically

* Again today we will be using the package “deSolve” to solve the logistic population growth numerically and visualize the population trajectories.
* I have created an interactive web app so that you can try out different inputs for the logistic model and see how the population dynamics change.
* The in-class exercise today is to select a set of input values of your choice and reproduce the population trajectory you see in the app.
* If you understand the basic principle of “deSolve”, then you can simply modify the code template last week and produce the results. If you’re still not so familiar with “deSolve”, please review the lab section last week to see how to solve differential equations with it.
* Of course, Prof. Ke and I are here to help so you can come to us later in gather town if you need any help.
* Any questions?

1. Code explanation Part 2: the relationship between population growth rate (dN/dt)/per capita growth rate (dN/(dt\*N)) and population size (N)

* Take a look at the relationship between population growth rate (dN/dt) and population size (N), as well as between per capita growth rate (dN/(dt\*N)) and population size (N), for a logistic growth model.
* This is just to visualize what we’ve learned today in the lecture, and so don’t feel bothered if you can’t understand the code.
* For the population growth rate, it’s the total change in the number of individuals in the population per unit time given a certain population size. As you can see, it shows a hump-shaped relationship with the population size. The maximum addition of individuals per unit time occurs at the half carrying capacity.
* As for the per capita population growth rate, it’s the averaged change in the number of individuals in the population per unit time given a certain population size. It shows a negative linear relationship with the population size. This means that the negative effects between individuals get higher with increasing population size, and the rate becomes zero at the carrying capacity.
* Any questions?
* Move to gather town and practice yourself:

1. Time to get your hands dirty and play around with the code.
2. You can take a seat in any of the private spaces; Prof. Ke and I will walk around to see if you guys have any questions, can be anything in the lecture, lab, or assignments.
3. You are free to go if you are done with today’s class and remember to turn in the assignments on time.