

Bioinformatics Programming 101 activity hand-out

If you already knew how to program, write those program in your favorite language.

0. Please “clone” the repository for the class programming by issuing this command: `git clone https://github.com/htruong/perlbio101` then `cd perlbio101`
1. First steps
 - Try to run `hello-world.pl`.
 - Variables are an useful concept in programming. Inspect `hello-person.pl` to see how they are used to make personalized greetings.
 - `if` statements are used to test variables to make sure the variables being tested have certain properties. Try to run `hello-person-2.pl` and see what it does. Try to look at `hello-person-2.pl`. Modify it so it greets me (Huan), Gavin or you with the secret greetings (They are called **backdoors**, but don't be evil).
 - You can manipulate variables too. Have a look at `hello-person-3.pl`. It automatically changes the first character of any name to uppercase. But then the program breaks down when the first character is already in uppercase! How would you fix it?
 - Computers are good at doing things repeatedly. Modify `hello-world-100.pl` and `hello-world-while.pl` so that the program prints Hello 100 times with a `for` and with a `while` loop.
2. A `fastq` file reader
 - A `fastq` file (`.fq`) is a text-based file for storing both a biological sequence (usually nucleotide sequence) and its corresponding quality scores. We often care more about the sequences but not the quality scores. We will build a program to convert the `fastq` to a `fasta` file that contains only the sequences by ‘trimming’ all the low-quality reads.
 - Have a look at `fastq` on **Wikipedia** to understand the file format, and then open `lab1.fq` to inspect it.
 - Derive a strategy to convert a `fastq` to `fasta` (Imagine you hire an assistant. How would you describe to her how to covert `lab1.fq` to `lab1.fas`).
 - To start I have created some step-by-step problem-solving solution for a `fastq` reader. Look at `fastq-reader-1.pl` through `fastq-reader-7.pl` and solve each problem step-by-step.
3. A list comparer

- Every once in a while, there would be a person asking me that they have a problem that has been bothering them for days: They wanted Excel to find common things from two relatively messy, unformatted lists. We will try to come up with a program that reads two lists and tell us what are common among those two lists using arrays.