Part A:

1. Make sure you system has the a recent version of [bcc-tools](https://github.com/iovisor/bcc/blob/master/INSTALL.md) installed. The class VM has this already installed; on other systems, you'll have to install it yourself.
   * Have recent version of bcc-tools installed
2. Download [3000pc.zip](https://homeostasis.scs.carleton.ca/~soma/os-2021f/code/3000pc.zip), unpack, and run make to compile 3000pc-fifo and 3000pc-rendezvous.
   * Downloaded with wget and ran make in 3000pc folder
3. Note that these programs take 3 arguments each:
   * The number of events to process
   * The number of events to produce before the producer sleeps for 1 second
   * The number of events to consume before the consumer sleeps for 1 second

- noted it needs 3 arguments to run…..all being numbers

1. Run both programs with the same arguments of your choice. Do this a few times. Do they behave the same way? Do you notice any differences?
   * The word index start for fifo is at 0 while rendezvous is at 1
   * For rendezvous the producer always sleeps at the start for 1 second while fifo some times does the same depending on the arguments
   * The words are usually different id assume its due to a random pick from an array of words
2. Repeat the above experiment, this time running each program under strace (with the -f flag to trace children too). Do you notice any difference in the system calls each program makes?
   * With the same arguments 3000pc-rendezvous has 1 more system call than 3000pc-fifo
   * Fifo uses pipe2 system calls
   * Rendezvous uses getpid() and futex system calls
3. In the next question, you will be playing around with trace from bcc-tools. As it makes use of eBPF, a Linux kernel extension mechanism, it needs to be run **with root privileges**. Because the command isn't in a standard directory in the class VMs, you'll need to become root with sudo -i and then run trace (rather than sudo trace). We will explore eBPF more in later tutorials.
   * Done and navigate to tut6 while run as root
4. Here are some example trace commands to play with. You can learn more about trace from its man page. Note these assume you unpacked the 3000pc.zip in the Documents folder.
   * Report on the string passed to pick\_word() on its return:
     1. trace ‘r:/home/student/comp3000/tut6/3000pc/3000pc-fifo:pick\_word “%s”, arg1’ doesn’t matter which folder youre in. needs to use the full path
     2. print the buffer passed to read function as a string (on read’s return) for process 6312 (running 3000pc-fifo, wont work on 3000pc-rendezvous):