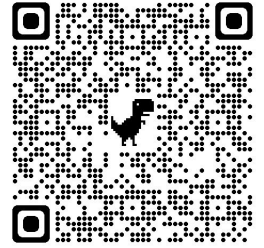


# Briefing: Programming Assignment 2

CS5229 Advanced Computer Networks

TA: Khooi Xin Zhe


# Group Registration



- Up to 2 per group
  - Can work on the assignment individually as well
- Register by 7 OCT 2023 at <https://forms.gle/YT7cxmVWELgfBKKo9>

# Prelude: P4 Tutorial


Repository: <https://github.com/p4lang/tutorials> (Included in the VM)

 **tutorials** Public


[Edit Pins](#) [Watch 93](#) [Fork 820](#) [Starred 1.1k](#)

[master](#) [10 branches](#) [2 tags](#)

[Go to file](#) [Add file](#) [Code](#)

 **jafingerhut** 2023 jul updates to vm ubuntu 2004 scripts (#523) ... 01ed2c4 on Jul 26 149 commits

exercises	Fix broken links to P4Runtime (#473)	last year
utils	Support negative-valued action parameters (#483)	4 months ago
vm-ubuntu-20.04	2023 jul updates to vm ubuntu 2004 scripts (#523)	3 months ago
vm	clean-up trailing whitespace (#453)	last year
.gitignore	P4 Developer Day 2018 Spring (#159)	5 years ago
LICENSE	added Apache 2.0 LICENSE file	8 years ago
P4_tutorial.pdf	Remove extra slides (#192)	5 years ago
README.md	Add link to install steps to README (#498)	8 months ago
p4-cheat-sheet.pdf	Adding P4 cheat sheet and its latex source files. (#201)	5 years ago







 **README.md**

## P4 Tutorial

If you are reading this while not attending a live P4 tutorial class, see [below](#) for links to information about recently given live classes


### About

P4 language tutorials

-  Readme
-  Apache-2.0 license
-  Activity
-  1.1k stars
-  93 watching
-  820 forks

Report repository


### Releases 1

 **P4 Developer Day 2018 Spring** Latest  
on Jun 6, 2018

### Packages

No packages published

### Contributors 40



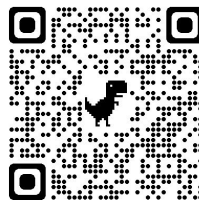
# Important Dates!


- Part A: Baby Steps in P4 (8%)
    - Fake Ping (4%)
    - Secret Message Exchange (4%)
  - Part B: Network Monitoring with Sketches (10%)
- DUE: 23 OCT 2023**
- DUE: 20 NOV 2023**





**QUIZ 3 on P4 Tutorial, W7 and W8 Tutorials!**  
**When? 13 OCT 2023**




# Assignment Package

Repository: <https://github.com/NUS-CIR/cs5229-2023-p4>




 **cs5229-2023-p4** Public



 Edit Pins  Watch 0  Fork 0  Star 0

 main  2 branches  2 tags

[Go to file](#) [Add file](#) [Code](#)

 **khooi8913** fixed typos 695ddf3 2 days ago 3 commits

part_a	v1.0 ready for release	2 days ago
part_b/sketch	fixed typos	2 days ago
testlib	v1.0 ready for release	2 days ago
utils	v1.0 ready for release	2 days ago
.gitignore	v1.0 ready for release	2 days ago
LICENSE	Initial commit	2 months ago
README.md	fixed typos	2 days ago

 README.md 

## CS5229 Advanced Computer Networks - Programming Assignment 2







This repository hosts the distribution package of Programming Assignment 2 for the NUS CS5229 Advanced Computer Networks course.

### Assignment Package

Part A: Baby Steps in P4 (8%)

### About


CS5229 AY2023/2024 Programming Assignment 2

-  Readme
-  GPL-3.0 license
-  Activity
-  0 stars
-  0 watching
-  0 forks

[Report repository](#)


### Releases






2

 **v1.0.1-20230930** Latest  
2 days ago

[+ 1 release](#)

### Languages



 Python	86.0%	 P4	7.4%
 Shell	3.2%	 TeX	2.9%
 Makefile	0.5%		

### Suggested Workflows

# Development Environment

- P4 Development Virtual Machine
- We support AMD64 and ARM64-based machines
  - AMD64 (VirtualBox):  
[https://www.comp.nus.edu.sg/~khooixz/cs5229/p4-dev-x86\\_64-build-220823.zip](https://www.comp.nus.edu.sg/~khooixz/cs5229/p4-dev-x86_64-build-220823.zip)
  - ARM64 (UTM/QEMU):  
<https://www.comp.nus.edu.sg/~satis/cs5229/p4-dev-aarch64-build-220823.zip>

**SETUP YOUR ENVIRONMENT EARLY!**

## Part A: Baby Steps in P4 (8%)

- Fake Ping (4%)
  - Generate responses to ICMP echo replies received
  - Do not generate responses if matches with an entry in the pre-defined filter table
- Secret Message Exchange (4%)
  - Sender: Drops off secret message(s) to the switch
  - Receiver: Picks up the secret messages(s) from the switch
    - Compute checksum of messages to verify integrity!

**PLEASE, READ THE READMEs**

**DUE: 23 OCT 2023**

# Part B: Network Monitoring with Sketches (10%)

- Sketches
  - Report heavy hitters to an external collector if the HH threshold,  $x$ , is exceeded
  - Drop suspicious traffic if the drop threshold, say  $y$ , is exceeded
  - Sample traces are provided

**PLEASE, READ THE READMEs**

**DUE: 20 NOV 2023**



# Submission Instructions

- Submit **only** the P4 files – **fake\_ping.p4**, **secret.p4**, and **sketch.p4**
  - 1-pt penalty per submission applies if fail to follow the instructions.



## Programming Assignment 2 - Part A - Fake Ping

Available until 30 Oct at 23:59 | Due 23 Oct at 23:59 | 4 Pts



## Programming Assignment 2 - Part A - Secret

Available until 30 Oct at 23:59 | Due 23 Oct at 23:59 | 4 Pts



## Programming Assignment 2 - Part B - Sketch

Available until 27 Nov at 23:59 | Due 20 Nov at 23:59 | 10 Pts

# Grading

- Make sure you **submit a program that compiles!**
  - If necessary, comment out certain blocks that you are unable to finish, and leave detailed comments on your thought process - partial credit might be awarded.
  - *Programs that cannot be compiled are graded harshly – 0%, and will not be manually inspected – **appeals for this case may not be entertained.***
- Programs will be testing using the Packet Test Framework (PTF) with our predefined test cases to evaluate your program behavior
  - Similar to Unit Tests.
  - Public test cases are given in the assignment package – make sure to test your program first!
    - Though, not all public test cases will be awarded credit.
  - Additional hidden cases will be used for grading.

# Late Penalty

- 20% penalty per day
  - submissions 5 days after the deadline will not be graded, and marked as 0%

Demo

Questions?