Distributed Systems
Pre-assignment

For the labs of this course, you will need some basic knowledge of *Python* and some familiarity with a Python web-framework called *Bottle*. Moreover, you will need a basic understanding of the *Mininet* network emulator. This pre-assignment helps you get familiar with them.

1 Python

1. Google offers a basic Python course at `https://developers.google.com/edu/python/`. Visit the course and learn basic Python's features if you are not familiar with it.

2. Finish all three basic exercises in the Google's Python course `https://developers.google.com/edu/python/exercises/basic`, i.e. string1.py, list1.py and wordcount.py.

2 Python servers using Bottle

In the labs you will implement simple python web servers. You can use the *Bottle* framework, that allows you to set up a simple server with a few lines of code and then easily build your application on top of it.

In the following page, you can find a instructions on how to setup Bottle and run a test server that displays a test page when contacted: `https://bottlepy.org/docs/dev/`. After installing Bottle (either with *pip install bottle* or by simply downloading `bottle.py`), copy the code snippet into a python script and run it. Then, open your favourite browser and connect to *localhost:8080/hello/world*. You should be able to see the test page.

In this course, we we will stick to the basic features of Bottle. Some of the more advanced ones are detailed here: `https://bottlepy.org/docs/dev/tutorial.html`.

3 Mininet

Mininet is a network emulator which creates a network of virtual hosts, switches, controllers, and links. It enables you to create and manage custom network topologies with several hosts, all in the same physical machine. Mininet is a full-blown emulator with many capabilities, but in this course we will use it for a single purpose: to create and connect multiple servers for your Python code to run on.

Visit `http://mininet.org` to learn more about Mininet. Then complete the following tasks:

Task A: Install Mininet. We have created for you a virtual image that has Mininet pre-installed. Download the image `here`. You can then use this image to setup up a VM, using any virtualization tool (e.g. VirtualBox, VMware or qemu).

If you don't want to work on a virtual machine and prefer to install Mininet on your own Linux machine, you can follow the instructions `here`[1].

Task B: Read the walkthrough. An introduction to Mininet can be found here `http://mininet.org/walkthrough/`. It shows how to run Mininet using simple typologies and run basic commands on the hosts.

Task C: Testing topologies. Start a default topology with two hosts and a switch (*sudo mn* should do just that), start a ping from h1 to h2 and mark down the results. Then start Mininet again with *sudo mn --link tc,bw=10,delay=10ms* and do the same ping. Do you see different values in round trip time?

[1]The computers in the lab room have qemu installed. If you want to use those machines instead of your laptop, it might be better to use `this image` instead. You can then boot the VM with the following command: `qemu-system-x86_64 -m 2048 -enable-kvm -vga vmware -boot c -hda ~/Downloads/Floodlight-v1.1+Mininet.vmdk`