Report for Project #5: Set up your own IP network

1. Team Members:

   Yuchen Wei (yw780) and Tiange Zhang (tz196)

2. Collaboration:

   We use GitHub to collaborate between the two of us, updating and communicating
   the parts we have completed and the changes and improvements we have made to
   the code. We also got some help from our recitation TA Parvathi. The primary
   reference materials we used in the process were from the lectures we received, the
   previous Python programming courses we participated in, and our experience in
   learning Python independently. We completed commands.txt and report together
   offline.

3. Is there any portion of your code that does not work as required in the description
   above? Please explain.

   After comparing the results of our tests with the samples included in the project and
   the description, we believe that our commands fulfill all the requirements of the
   description and can be reflected by the tests.

4. Did you encounter any difficulties? If so, explain.

   While we first used the WinSCP to transfer our AS352.py to VM and later transfer
   the command.txt, we could not successfully connect with the IP address we got of
   eth0 from ifconfig. There is no eth1 and the IP address of eth0 is weird starting with
   10.0.x.x. Then we got help from Piazza and asked our recitation TA Parvathi about
   this. She instructed us on how to solve this and explained why eth0's IP address
   could not be used on our local document transfer. And we got to set up both NAT
   and Host-only Network.

5. Describe two technical observations or facts you learned while working on this
   project. Please answer in specific and precise terms.

We clearly understood the different roles played by ping and traceroute when conducting these tests. Ping should be prioritized over traceroute because ping can be used to test reachability. If we establish a network connection that does not communicate successfully, it is less likely to pass the traceroute test. In contrast, the traceroute in this VM platform is not first built-in, so if we want to download the update traceroute, then we also have to pass the ping google.com test first to confirm whether there is a correct network.

Before completing this project, our lecture did not start with a complete study of the specific role of NAT, but this project helped us to understand its existence and particular role in advance. The IP address we found at first while we were trying to establish the ssh connection, in the beginning, pointed to the address that was actually translated by the NAT, which was specifically used for communication on the school's intranet, for example. Our local communication requires the IP address before it is translated by NAT, which is a structured IP address like 192.168.xx.xx.