CS 4390/5390: Computer Networks

Project 1

(This is a group assignment)

Total Points: 100

**Goal:** To make us familiar with (a) Socket Programming, (b) Web Proxy, (c) Wireshark tool, and (d) SMTP protocol.

**Motivation**: So far in this course we have been gaining some technical background of computer networking. We have been mainly following the textbook. We have been verifying things hands-on too Now it is time for you to take the next step to gain close-to-real-life experience by doing a project. You will do this with 2-3 other students as a group.

**Class Presentation** (10 points): In addition to submitting your technical work, your group also needs to present a summary of the work in the class. In particular, on March 11 in class (whereas the due date of the project submission is 11:59 pm of March 10), your group needs to do a 5-minute presentation (using ppt or so). Your group does not need to present the whole project. Your group can focus only on one task, which we will collectively decide in class on March 9.

**Task 1**. (30 points) Do one Socket Programming Assignment. In particular, you need to implement a *Web Proxy.* The task description is as follows.

When your proxy receives an HTTP request for an object from a browser, it generates a new HTTP request for the same object and sends it to the origin server. When the proxy receives the corresponding HTTP response with the object from the origin server, it creates a new HTTP response, including the object, and sends it to the client.

Companion Website (<https://media.pearsoncmg.com/ph/esm/ecs_kurose_compnetwork_8/cw/>) provides the skeleton code for the proxy server. Your job is to complete the code, and then test it by having different browsers request Web objects via your proxy.

To submit: (a) python code of your proxy, and other files, if any, (b) relevant screenshots to prove that your proxy has the intended behavior.

**Task 2**. (30 points) Attached is a hands-on lab, which is about experimentation on DNS protocol with the Wireshark tool. Do the lab, and submit what is asked for. Also, submit relevant screenshots to prove that you are able to do the lab task.

**Task 3**. (30 points) Write an email client in Python 3. Your mail client should use a public SMTP server (e.g. Google’s server smtp.gmail.com) as the (sending) mail server to send an email to your friend’s (i.e. another member of this project group) BGSU email address.

1. First, implement an email client to send a plain (without attachment) email.
2. Then, implement an email client to send an email with attachment (e.g. a pdf file).

You are allowed to take help from <https://realpython.com/python-send-email/> . However, avoid copying code, and do things in your own way after understanding the idea from the above site. Reusing a few lines of code snippet could be fine if you clearly say so.

*To-submit*: Write (and submit) detailed documentation on what preliminary steps you need to do to make the public SMTP server work (e.g. changing setting in your google account) for this task. Submit the code of your mail client. Take screenshots to substantiate that your client works and submit them.