

## Mini Assignment 1

### Setting Up

Due: January 25, 2022 at 23:55

## INTRODUCTION

The purpose of this mini assignment is to help you become familiar with some of the tools and background you will need in this course.

You are expected to do all your work on your own. Plagiarism and cheating are a serious offence. You may ask classmates, TAs and the professor clarification questions.

Exercise 1 must be conducted using the SOCS server mimi.

Exercise 2 must be conducted using the SOCS server mimi.

Exercise 3 must be conducted using your personal computer.

You are expected to submit this mini assignment in the myCourses assignment tool: “mini 1” box.

## EXCERSISES

### Exercise 1 – Getting a SOCS account

The work you will do for this course will be carried out either directly on your personal computer or from the School of Computer Science’s web server. This exercise will get you connected to the school’s web server, if you have not done so already. Students who have taken COMP 206 have most probably already completed this exercise in that course.

Consult this web resource, if you like before starting: <https://www.cs.mcgill.ca/docs/> select “Accounts”.

Do the following:

- Step 1: Create a SOCS user account, if you have not done so already. To create the account, visit <https://newuser.cs.mcgill.ca> from any McGill IP (VPN). You will be prompted for your McGill student number, your first and your last name (as they appear in McGill's database!). Once your record is found and that you agreed to the terms, you will be given your CS username and a temporary password. Alternately you can email [help@cs.mcgill.ca](mailto:help@cs.mcgill.ca) for assistance.
- Step 2: Confirm that you created the SOCS account by logging into mimi.
  - o For Mac or Windows:
    - MAC: go to your “terminal” and then at the command prompt **ssh** into the server. Do it this way: **ssh** [username@mimi.cs.mcgill.ca](mailto:username@mimi.cs.mcgill.ca) or **ssh** [username@cgi64.cs.mcgill.ca](mailto:username@cgi64.cs.mcgill.ca). It will then ask for your password. It may ask you a YES/NO question, answer YES.
    - WINDOWS: go to your “cmd” and then at the command prompt **ssh** into the server. Do it this way: **ssh** [username@mimi.cs.mcgill.ca](mailto:username@mimi.cs.mcgill.ca) or **ssh**

[username@cgi64.cs.mcgill.ca](mailto:username@cgi64.cs.mcgill.ca). It will then ask for your password. It may ask you a YES/NO question, answer YES.

- OPTIONAL: If ssh does not work on your computer, then download **putty** to get a compatible program to ssh. <https://www.putty.org> Once the program is downloaded, run it and enter in the server name, either mimi.cs.mcgill.ca or cgi64.mc.mcgill.ca. You will be prompted for your username and password.

Submit the following:

- Type **ls** to display the files in your directory (if you have any). Show that you logged in as proof.
- Take a screenshot of the result from doing ls. Call that file: **m1q1.jpg**.
- Submit that screenshot as your solution to question 1.

### Exercise 2 – Packets

Make sure you are logged into mimi. Create a text file named **m1q2.txt** using **vim**.

Answer the following question in that text file:

Q 2.1: Convert the string “Bob” into ASCII. Note: it has 4 characters: B, o, b, null character.

Q 2.2: Convert the ASCII from Q 2.1 into an 8-bit binary number for each character.

Q 2.3: Convert the binary into a sound, the binary 1 becomes an H representing the high sound and 0 becomes a L for low sound.

Q 2.4: Modulate the sound from Q 2.3 using A for 11, B for 10, C for 01, and D for 00; Where the letters ABCD represent different sounds.

Q2.5 How many bits are we saving after modulating?

Save the answers to these question in the file **m1q2.txt**.

Submit the following:

- Type **cat m1q2.txt** and take a screenshot to prove that you did this on mimi. Save the screenshot as **m1q2.jpg**.
- Submit m1q2.txt and m1q2.jpg as your solution to question 2.

### Exercise 3 – Wireshark recording

Wireshark is a useful tool to diagnose your internet connection and to learn more about packets and IP addresses and protocols. Wireshark is a tool that records the activity passing through your network card. This activity can be wireless or wired network packets. It can be Internet or local area network packets. It captures everything storing the “traffic” in a file that you can then view through the software. We use this tool to analyze the packets by sorting the columns and rows as you search for information and patterns.

Do the following:

- Download Wireshark at <https://www.wireshark.org/download.html>
- Install it

- Run it to make sure it works. If you have a firewall you may need to deactivate it and reinstall. Assume that this is not the case and just try it the first time with your firewall still running. If it did not work, then deactivate your firewall and try again.
- Assuming Wireshark is running:
  - o Press the “record” button
  - o Then open your browser and type [www.cs.mcgill.ca](http://www.cs.mcgill.ca) and wait for the school’s home page display
  - o Once you see the home page, then go back to Wireshark and stop recording
  - o Open/Look at the recording you made and try to find two things:
    - The packet that stores your request for [www.cs.mcgill.ca](http://www.cs.mcgill.ca)
    - The packet that contains the webpage that was returned to your browser
- Take some time to look around for these two packets. Try to identify the parts of the packets and try to deduce the meaning of the parts.

Submit the following:

- Expand the packet that contains the request to GET [www.cs.mcgill.ca](http://www.cs.mcgill.ca), and take a screenshot. Call that **m1q3a.jpg**. Make sure it is clear that the screenshot shows it is the request packet.
- Expand the packet that contains the returned webpage containing the home page of [www.cs.mcgill.ca](http://www.cs.mcgill.ca). Take a screenshot and call it **m1q3b.jpg**.
- Submit these two JPG files as your solution to question 3.

## WHAT TO HAND IN

The following files must be submitted to the “mini 1” box in the Assignment Tool at myCourses:

- m1q1.jpg
- m1q2.txt and m1q2.jpg
- m1q3a.jpg and m1q3b.jpg

## HOW IT WILL BE GRADED

This mini assignment is worth 20 points and part marks can be awarded.

Deduction points:

- -3 for not following instructions

Awarding points:

- +5 points for Q1: demonstrates the ls command on mimi for the user’s account.
- +5 points for Q2: 1 point for each subproblem (there are 5 subproblems)
- +5 points for Q3A: showing the request packet
- +5 points for Q3B: showing the response packet