

THE UNIVERSITY OF WESTERN ONTARIO

DEPARTMENT OF COMPUTER SCIENCE
LONDON CANADA

Software Tools and Systems Programming
(Computer Science 2211a)

ASSIGNMENT 1

Due date: Friday, September 22, 2023, 11:55 PM

Assignment overview

We would like students to get experience with Unix basics, C compilation, and assignment submission process.

For questions 1, 2, and 3, the answers should be typed and then converted to a pdf file, **asn1_answer.pdf**.

1. Answer the following questions.

- a. What is an operating system?
- b. What is a kernel of an operating system?
- c. What is a shell in Unix operating system?

2. Answer the following questions. For this question, we assume that your current working directory is `~/courses/cs2211/Asn/asn1/q2q3`. You should create directories along the path if they do not exist.

In `q2q3` (i.e. `~/courses/cs2211/Asn/asn1/q2q3`), create two directories, `df1` and `df2`, and two text files, `tf1` and `tf2`.

In `df1` (i.e. `~/courses/cs2211/Asn/asn1/q2q3/df1`), create a text file `df1`.

In `df2` (i.e. `~/courses/cs2211/Asn/asn1/q2q3/df2`), create a directory `tf1`.

- a. What command do you use to create a directory?
- b. What command do you use to create a text file?

3. Answer the following questions for the use of Unix **ls** command assuming that you log in `compute.gaul.csd.uwo.ca` and your current working directory is `~/courses/cs2211/Asn/asn1/q2q3`.

For this question (3a, 3b, 3c, and 3d), for **ls** command, we ask you to use **/usr/bin/ls**.

(Note: In `compute.gaul.csd.uwo.ca`, **/usr/bin/ls** is the original command and **ls** is the original command with color option added.)

- a. What is the result of command **/usr/bin/ls df2 df1 tf2 tf1**?

- b. What **ls** option(s) should we use if we want to display permission information?
(hint: use **man ls** and check options related to long format).
- c. What option(s) should we add to **/usr/bin/ls df1 df2** to display permission information of *df1* and *df2* but not their contents?
(hint: use **man ls** and check options related to directory).
- d. Compare the results of commands **/usr/bin/ls** and **/usr/bin/ls .** , are the results different and why?

Now demonstrate your answers by typing the appropriate commands and capture the screen (record your session) in a file called **asn1_q3.script** with the following steps.

- Type **script asn1_q3.script** to begin your screen capture session.
- Type **date** to show date and time
- Type **whoami** to show your user name.
- Type **pwd** to show your current working directory
- Type commands to demonstrate your answers for 3a, 3b, 3c, and 3d
- Type **exit** to stop and exit your screen capture session.
- Type **mv asn1_q3.script ..** to move this file to the parent directory.

4. Your first C program. For this question, we assume that your current working directory is `~/courses/cs2211/Asn/asn1`. Use a Unix editor, i.e. *vi* or *emacs*, to create a new C program file, named **asn1.c**. Your program should output the exact following to the screen:

Hello, CS2211 2023!

Compile your program with **gcc** and ensure that the executable is labeled: **asn1**. The following step will record your screen session and complete question 4 with a file called **asn1_q4.script**.

- Type **script asn1_q4.script** to begin your screen capture session.
- Type **date** to show date and time
- Type **whoami** to show your user name.
- Type **pwd** to show your current working directory
- Type commands to compile your program resulting a executable file named: **asn1**
- Run the program **asn1**.
- Type **exit** to stop and exit your screen capture session.

For assignment 1, in your Gaul account, you should have the following files or directory in directory `~/courses/cs2211/Asn/asn1` to be submitted:

- **asn1_answer.pdf** (for question 1 to 3)
- **asn1_q3.script** (for question 3)
- **asn1_q4.script** (for question 4)
- **asn1.c** (for question 4)
- **asn1** (for question 4)
- **q2q3** (for question 2 and 3)
- **assignment_academic_consideration_form.txt** (download and fill with the required information **if** you have requested an academic consideration through faculty academic counselling)

Change your current working directory to `~/courses/cs2211/Asn`. Create a file named **YourUserName_asn1.tar.gz** with command **tar -czvf YourUserName_asn1.tar.gz asn1** and submit this file for assignment 1. **YourUserName** should be your UWO email account user name which is the same as your Gaul account login user name.

To submit this file for your assignment 1,

- copy this file to `~/tmp`
- use command **tar -xvf YourUserName_asn1.tar.gz** to open this file at `~/tmp`
- make sure `~/tmp/asn1` is exactly the same as `~/courses/cs2211/Asn/asn1`
- this is to make sure that the **YourUserName_asn1.tar.gz** file contains the correct information for your assignment 1
- down load this file to you home computer with **sftp** command.
- from your home computer, submit this file to owl.

(For detailed information, please check *CS2211 Assignment Submission Guidelines*).

For **asn1_answer.pdf**, the following six lines should appear on the first page.

CS2211 2023

Assignment number

Your name

Your student number

Your UWO User Name

Date Completed

For **asn1.c**, the following six lines should appear from line 1 to line 6 as comments.

// CS2211 2023

```
// Assignment number  
// Your name  
// Your student number  
// Your UWO User Name  
// Date Completed
```

Please check CS2211 Assignment Submission Guidelines on OWL website for detailed information of submission process.

For assignment 1, we listed all steps for script command, all information needed for .pdf and .c files, and all files to be submitted, though the information can be found in CS2211 Assignment Submission Guidelines. This is to help you to get familiar with the submission process. Starting from assignment 2, we may not provide all these details.