University of Windsor

School of Computer Science
Faculty of Science
COMP-2560: System Programming, Fall 2021

Lec#	Date	Title	Due Date	Grade Release Date
Lec04	Week 04	**Shell**	Oct. 20, 2021, Wednesday 4:00 AM EDT	Oct. 25, 2021

The objectives of the weekly lecture assignments (Lecs) are to practice on topics covered in the lectures as well as improving the student's *critical thinking and problem-solving skills in ad hoc topics that are closely related but not covered in the lectures*. Lecture assignments also help students with research skills, including accessing, retrieving, and evaluating information (information literacy).

Lecture Assignments Deliverables

You should answer **two questions** below using an editor like MS Word, Notepad, and the likes or pen in papers. In the latter case, you must scan the papers clearly and merge them into a **single file** `lec02_uwindid.pdf` containing your `name`, `uwinid`, `student#`. **Please note that if your answers cannot be read, you will lose marks.** Please follow the naming convention as you lose marks otherwise. Instead of `uwindid`, use your own account name, e.g., mine is `hfani@uwindsor.ca`, so my submission would be: `lec02_hfani.pdf`

Lecture Assignments

Select two questions based on your preference!

1. Is `cc`, the C compiler, a built-in command of a shell of a UNIX-based/like operating system? Justify your answer.
2. How can we distinguish between shell's built-ins (commands) and a program which requests the shell to be bootstrapped?
3. Why not make all library routines and programs part of the shell?
4. Is it possible to change the default (login) shell of a user in a UNIX-based/like operating system?
5. Compare shells with and without GUI? Explain the pros and cons of each.
6. How can we add a new environment variable? How can we make it persistent? What is the difference between adding and making persistent?
7. What happens when your program file has the same name as
   a) one of the built-ins of a shell?
   b) one of the programs in directories defined in the PATH environment variable?
8. Do you prefer to do a System Call by `unistd.h` or use the library routine `stdlib.h` to access and manipulate environment variables? Justify your answer.
9. Is it possible to access user/shell variables in a program through System Call or library routines? How?
10. Does `sh` has the ability to run scripts? Justify your answer.
11. Let's assume `sh` accepts scripts. Is it able to run `bash` scripts? How about the reverse; is `bash` able to run `sh` scripts? Justify your answer. (*hint: think of* `sh` *as the POSIX standard.*)