# DSCI 551 – Fall 2025

## Homework 2: File system

**Due: 11:59pm, September 22, 2025, Monday**

**NO Late Submissions will be accepted!**

Every file system (including HDFS) needs to maintain a hierarchy of objects (files and directories) in the system. It also needs to provide a list of commands (e.g., mkdir) for users to interact with the system (e.g., create a directory).

In this homework, we will develop an app that emulates how a file system maintains the hierarchy of files and directories, and interacts with the users. We provide you with an example implementation of such an app which is almost complete, expect for the implementation of the functions for removing files, directories, and dumping the namespace of the file system. Your task will be to complete and test the implementation of these three functions.

Specifically, the handout includes the following files:

* filesystem.py: which defines Node class that stores file system objects, FileSystem class that allows one to format the system, add drop users from the system (you can ignore drop user for this homework). It also implements a Session class that keeps track of login of a particular user, and implements the basic file system commands, including ls, cd, pwd, mkdir, and touch.
* hw2session-template.py: this file has a class HW2Session that extends Session to implement rmdir, rm, and dump\_fsimage functions. Rename this file to hw2session.py and fill in the missing codes.
* 551\_hw2\_testing.ipynb: this shows how the app is run and how your implementation of the above three functions will be tested.

**Submissions:**

1. Your completed hw2session.py.
2. A notebook file, hw2-testing.ipynb, for testing the implementation of three functions. Your notebook file should show the output of interacting with the file system, similar to that in the provided testing script, for different scenarios (e.g., removing an non-existing files or directories, removing an non-empty directory, etc). Note that dump\_fsimage() will be automatically called when you exit the session.
3. Add a Google colab link for your hw2-testing.ipynb file at the beginning of the file (as comment, see example notebook). Please make sure the link is accessible.
4. Do not zip the submission files.