

CSc 422/522 — Homework 1, Part A

due Tuesday, February 2

This programming exercise is worth 20 points. Turn in commented listings of both programs (paper copies only) and the results from a few tests. We will give you instructions later on the tests to run. Your programs will be graded for correctness (80%) and style (20%); see the attached handout on Presentation Points.

First write a sequential program that implements a simplified version of the Unix `diff` command for comparing two text files. If `diff` is the name of your executable file, then the program should be invoked as:

```
diff filename1 filename2
```

The two command-line arguments are the names of text files. Your program should print out all lines in the two files that are different. In particular, for each pair of lines that differ, print:

```
filename1 lineNumber: line from file 1
filename2 lineNumber: line from file 2
```

If one file is longer than the other, there should also be one output line for each extra line in the longer file.

Second write a parallel version of your sequential program. Use three processes: two to read the input files and one to compare lines and print the ones that differ. The input processes should use what is called *double buffering*: Read into a second input buffer while the first is being examined by the output process. The processes will need to synchronize to make sure buffers are not overwritten before they are examined. Use flag variables and busy waiting to program the synchronization.

At the end of each program, print the execution time of the program as measured by the `SRage()` function. Start timing after initializing variables and opening the input files. End timing just before printing the execution time.