CSCE 3030 PARALLEL PROGRAMMING, Spring 2015

Exam: March 26, 10:00am-11:20am

Answer 2 out of the following 3 questions, for 15 points each

Question 1
There are two reasons for parallelism: better performance and ability to better describe concurrent execution.

- Sketch 3 use cases where the key result of parallelism is increased performance
- Give 1 example where parallelism makes programming concurrent tasks easier

Question 2
Two threads loop by calling repeatedly a random number generator that returns values between 1 and 100.

Write a Java or C-based program that ensures that both threads stop as soon as one of the threads hits a number larger than 95.

Question 3
Two threads $t_1$ and $t_2$ share access to a string buffer $s$ of size 1000 characters initialized with "abracadabra".

The thread $t_1$ performs repeated replacements of the substring "bra" with "brabra".

The thread $t_2$ performs replacements of the substring "bra" with "nobra".

Both threads check for buffer overflow and each stops if its replacement operation would result in a string longer than 1000 characters.

Implement this algorithm as a C or Java program.