C/C++ Programming in a UNIX Environment, CS 3377, Assignment 08

1. [25] Write a program using the Pthreads API that prints “Hello, World!” from four threads it creates and prints the ids of the threads along with in the format “Hello, World! from thread id : 0” from each of the threads. You can use a global variable to declare the number of threads to be created and set that to 4 for this assignment.

2. [75]

   Fibonacci is a program that generates the Fibonacci sequence of a length N specified by the user. The Fibonacci sequence is the series of numbers 0, 1, 1, 2, 3, 5, 8, …. It is defined by the following mathematical expression, with x_0 and x_1 being 0 and 1, respectively:

   $$x_n = x_{n-1} + x_{n-2}$$

   Runner is a program that takes a positive integer N as a parameter and finds the sum of first N integers.

   The user will input that positive integer N which will be used by both the Runner and the Fibonacci program. It should be checked to ensure that a positive number is being entered by the user. The data generated by Runner (the sum) and Fibonacci (the sequence as an array) will used by the threads and can be saved as a global variable.

   Write a C program that creates two threads to run the Fibonacci and the Runner processes. Threads will indicate the start and the end of their work by printing statements in the format “Thread K Starting” “Thread K Finished”, where K is the thread number. When the threads finish, the parent thread will output the results generated by the two threads by printing in the format, “The sum of first 5 numbers is: 15” and “The first 5 numbers in the Fibonacci sequence are: 0, 1, 1, 2, 3” if the user had input 5 as the value of N.