EE 3233 Systems Programming for Engineers (Fall 2023)

Programming Assignment 6

Name:_____ Score _____/50

Submit your assignment on blackboard.

1. Write a C or Python program that makes use of Popen. You will use Popen to **echo "Hello World"** into a file and Popen to read (25 points):
   a. Use Popen to execute an echo command to write to a file.
      a. Print "Using popen to echo 'Hello World' to a file"
      b. The file should be called **test.txt**
   b. Use Popen to read the contents of a file of the file using cat
      a. Print "Using popen to cat test.txt"
      b. Read contents of **text.txt** using cat
      c. Print the contents to screen

   (BONUS) 10 pts

   c. Use command line args in place of the "Hello World" and "test.txt"

   Expected response if using python:

```
$ python3 hw6_1.py
"Using popen to echo 'Hello World' to a file"
"Using popen to cat test.txt"
"text.txt contains 'Hello World'"
```

   Expected bonus response if using python:

```
$ python3 hw6_1.py "abc123" mytestfile.txt
"Using popen to echo 'abc123' to a file"
"Using popen to cat mytestfile.txt"
"mytestfile.txt contains 'abc123'"
```

   Expected response if using C:

```
$ ./a.out
"Using popen to echo 'Hello World' to a file"
"Using popen to cat test.txt"
"text.txt contains 'Hello World'"
```

   Expected bonus response if using C:

```
$ ./a.out "abc123" mytestfile.txt
"Using popen to echo 'abc123' to a file"
"Using popen to cat mytestfile.txt"
"mytestfile.txt contains 'abc123'"
```

2. Write a C or Python program that makes use threading (10 threads) to increment a counter from 0 to 1000000000, print the result. It should then decrement back to zero. (You'll need to use a mutex). (25 points)

   Expected response:

```
$ ./a.out or python equivalent
"Incrementing counter from 0 to 1000000000 using 10 threads"
"Final value is 1000000000"
"Decrementing counter from 1000000000 to 0 using 10 threads"
"Final value is 0"
```

   (BONUS) 10 pts

   Provide command line arg to set the counter value and number of threads so they can be specified by the user.