Exercise #2 Worksheet (Individual)
CS361
Concurrent Programming

Your name: _____

1. We have N names: stored in an array String colors[N]. Think of the names as strings such as “red”, “blue”, “green”.

We want to start up N threads, where the ith thread has its name in colors [i].

The main program has a variable int x that is initialized to 47. We want the threads to add onto x the length of their name. So for example, the first thread (red) would add on 3, the second (blue) would add on 4, etc. When all of this is done, the main program prints out the total.

There may be problems if we just start up all N threads and let them add onto the common variable x. There might be unpredictable results if two or more threads start incrementing at exactly the same time. So they should share a lock to make sure that only one at a time can increment x.

For each of the statements below, decide if it's true or false, or if you don’t know:

a) The threads must be started up by subclassing Thread and starting up an object of the subclass. Circle one: true false don’t know

b) There should be a lock as a local (stack) variable for each thread object.
Circle one: true false don’t know

c) You shouldn't make a copy of the lock(s) for each thread. They should all refer to the same lock.
Circle one: true false don’t know

d) The threads will do their work in the order in which they're started up. E.g. the red thread will add on 3 before the blue thread gets a chance to add on 4.
Circle one: true false don’t know

e) Each time you execute the program, you will get the same result for the total.
Circle one: true false don’t know

f) You will get the same result even without a lock, because there's only one line of code involved in changing the state of x, not several lines of code as in the bank account example. Since there's no interleaving, there's really no problem.
Circle one: true false don’t know

Hint: it may be useful to roughly sketch out the code in order to answer the question, although you may be able to determine a number of the answersScoring: .

6 points total: 1 point for making a reasonable attempt to respond to all parts a-f. Partial credit for lesser attempts.

Protocol:

(10 minutes individually decide on the answers)

(10 minutes group discussion. You get to change your answer if you are persuaded. Or maybe you will persuade someone else!)

g) (After the group discussion): +1 point: list the names of the other people you discussed this problem with.

There is only one sheet to turn in today. +7 points for completing all parts, but the 7th point you can get only after you do the group discussion of your individual answers.