Sockets Assignment 6 Report

Instruction:

Sockets assignment 6: threadedServer.py is a multithreaded server that can handle multiple clients at once, keeping a cumulative count of per-thread responses and total responses. Unfortunately sometimes the total response count gets messed up. Diagnose the problem and fix it. Do not change, move, or delete any existing lines of code; you may only add new code. The only system calls you may add are those in the \_thread or Threading modules. In your report, include evidence that your modifications solve the problem. (est 1 hour)

Explanation:

The needed locks commands are allocate, acquire, release. Allocate will create locks, acquire will starts the lock, and release will terminate the lock that was initiated on release.

The counter of cumulative response is messed up, thus I put the locks where the value cumulativeResponses is being used. Before assigning oldCumulativeResponses I put the lock (acquire), and after new value for cumulativeResponses is assigned I released the lock (release).  
In order to test, I combied the two lines of code:  
 *oldCmulativeResponses = cumulativeResponses  
 cumulativeResponses = oldCmulativeResponses + 1*

To  
 *cumulativeResponses =+ 1*

And put the lock around it. It worked same as having two lines of code.

Code:

Client: (unchanged)

1. #!/usr/bin/env python3
2. from socket import \*
3. s = socket(AF\_INET, SOCK\_STREAM)
4. s.connect(("localhost", 7069))
5. for x in range(1,5):
6. result = s.recv(512)
7. print(result)

Server:

1. #!/usr/bin/env python3
2. from socket import \*
3. import datetime, time, random
4. import \_thread
5. def clientHandler(clientSocket, address, threadNumber):
6. global cumulativeResponses
7. myResponses = 0
8. print("I'm a new thread, number %d" % threadNumber)
9. print(" handling communications with " , address)
10. for x in range(1,5):
11. l.acquire()
12. oldCumulativeResponses = cumulativeResponses
13. time.sleep(2)
14. time1 = time.time()
15. nowtime = datetime.datetime.now()
16. toSendString = "hello from " + gethostname() + nowtime.strftime(" %A %I:%M")
17. toSendBytes = toSendString.encode()
18. clientSocket.send(toSendBytes)
19. cumulativeResponses = oldCumulativeResponses + 1
20. l.release()
21. myResponses = myResponses + 1
22. print("Thread %d has done %d sends; all threads %d" %
23. (threadNumber,myResponses, cumulativeResponses))
24. clientSocket.close()
25. \_thread.exit()
26. ##### main #####
27. nThreads = 0
28. global cumulativeResponses
29. cumulativeResponses = 0
30. l = \_thread.allocate\_lock()
31. s = socket(AF\_INET, SOCK\_STREAM)
32. s.bind(("localhost", 7069))
33. s.listen(5)
34. while True:
35. nThreads = nThreads + 1
36. c,a = s.accept()
37. \_thread.start\_new\_thread(clientHandler,(c,a, nThreads))

Output:

A picture containing text, computer, screenshot, electronics

Description automatically generated