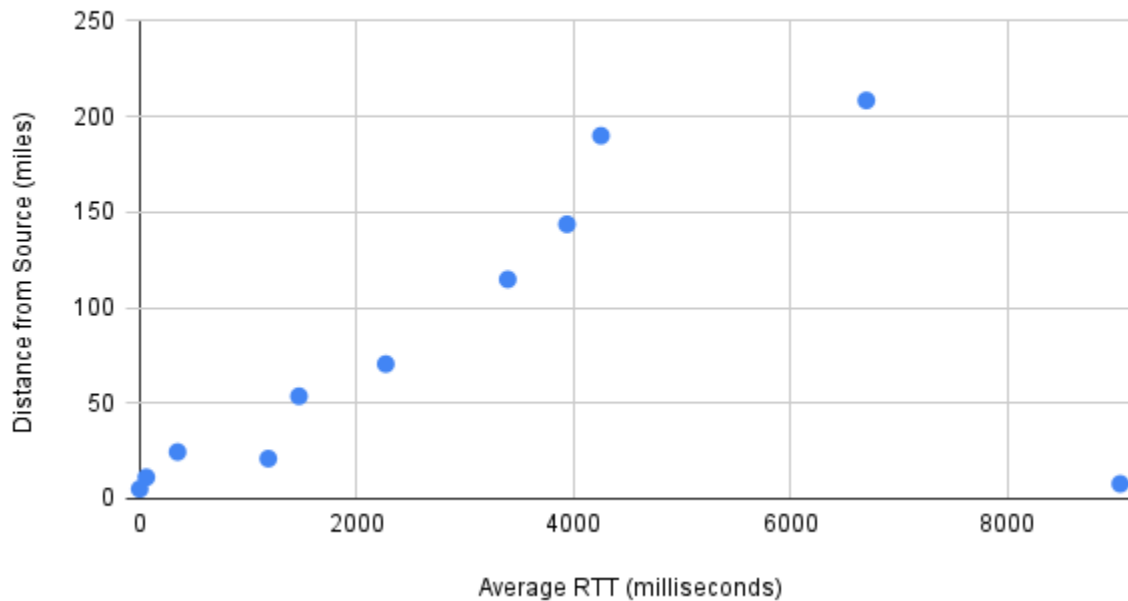- Using the pinger data, draw or create a scatterplot with the Average RTT in milliseconds on the Y-axis, and the geographic distance in miles on the X-axis. Save this scatterplot to be uploaded as one of your deliverables.
- Using the scatterplot you generated, answer the following questions:

Average RTT vs Distance

1. **Are RTT and geographic distance correlated positively, negatively, or not at all? If applicable, also comment on the strength of correlation (weak vs. strong).**
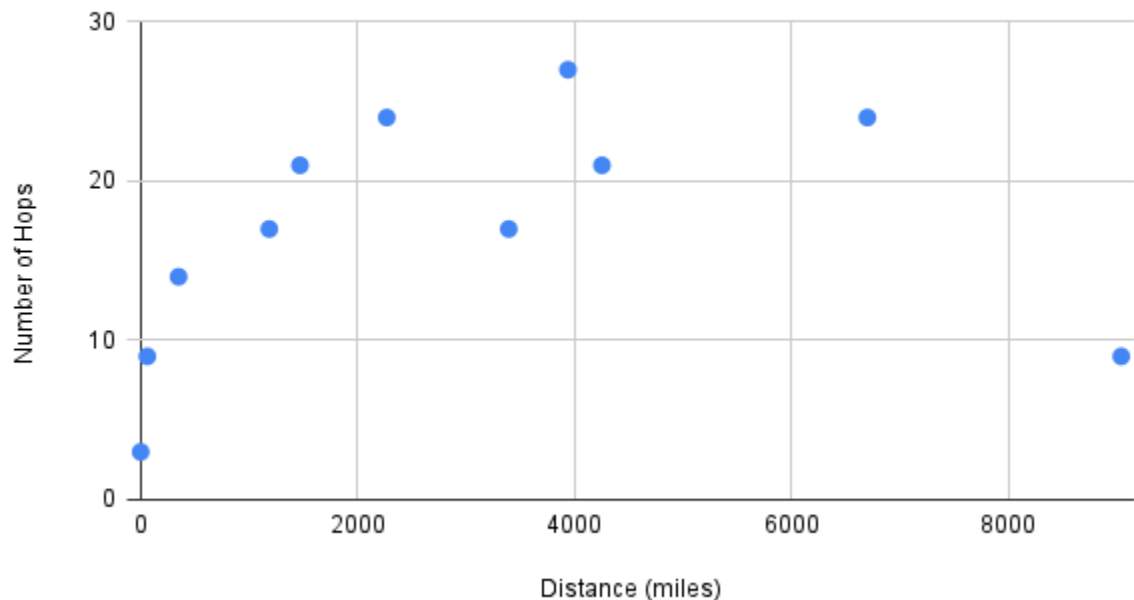
   RTT and geographical distance are strongly positively correlated. The further away the destination is, the more time it takes for a round trip to be completed.

2. **Why do you think you observe this trend (or lack thereof)?**

   I think this trend is observed because the further away the destination, the more the packet has to travel along multiple hops on a longer route.

- Using the traceroute data, draw or create a scatterplot with the # Hops to Target on the Y-axis, and the geographic distance in miles on the X-axis. Save this scatterplot to be uploaded as one of your deliverables.
- Using the scatterplot you generated, answer the following questions:

Hops vs Distance

1. **Are # hops and geographic distance correlated positively, negatively, or not at all? If applicable, also comment on the strength of correlation (weak vs. strong).**

   The number of hops is weakly positively correlated to the distance away from the source. To a certain extent, it takes more hops to reach a further destination. However, it is important to note that there are a few outliers to this rule, making the correlation weak.

2. **Why do you think you observe this trend (or lack thereof)?**

   I think this correlation is positive but weak because routers aim to find the fastest and most efficient way to get to a place and for further destinations, this can be done by hopping over fewer routers that cover more distance. A path with fewer hops but

greater physical distance may be chosen over a shorter path with more hops to optimize network performance.

Today's advanced technology can also allow data to be transmitted over long distances with fewer hops, using tools like underwater fiber optic cables to connect continents.

Execution Trace:

Pinger

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPpinger.py 104.102.112.162
Pinging 104.102.112.162 [104.102.112.162] 3 times using Python:
Ping 1 RTT 8.505821228027344 sec
Ping 2 RTT 9.155988693237305 sec
Ping 3 RTT 9.344339370727539 sec

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPpinger.py 104.102.112.162
Pinging 104.102.112.162 [104.102.112.162] 3 times using Python:
Ping 1 RTT 8.649587631225586 millisec
Ping 2 RTT 9.897470474243164 millisec
Ping 3 RTT 7.7724456787109375 millisec

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPpinger.py 104.102.112.162
Pinging 104.102.112.162 [104.102.112.162] 3 times using Python:
Ping 1 RTT 9.203433990478516 millisec
Ping 2 RTT 12.453317642211914 millisec
Ping 3 RTT 9.961366653442383 millisec

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPpinger.py 104.102.112.162
Pinging 104.102.112.162 [104.102.112.162] 3 times using Python:
Ping 1 RTT 15.94686508178711 millisec
Ping 2 RTT 8.562326431274414 millisec
Ping 3 RTT 9.076833724975586 millisec
Average RTT: 11.19534174601237 millisec

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPpinger.py 171.67.215.200
Pinging 171.67.215.200 [171.67.215.200] 3 times using Python:
Ping 1 RTT 71.40779495239258 millisec
Ping 2 RTT 71.27928733825684 millisec

Ping 3 RTT 68.75181198120117 millisec
Average RTT: 70.4796314239502 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 20.225.32.183
Pinging 20.225.32.183 [20.225.32.183] 3 times using Python:
Ping 1 RTT 54.43882942199707 millisec
Ping 2 RTT 53.582191467285156 millisec
Ping 3 RTT 52.84929275512695 millisec
Average RTT: 53.62343788146973 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 128.2.42.52
Pinging 128.2.42.52 [128.2.42.52] 3 times using Python:
Ping 1 RTT 23.908615112304688 millisec
Ping 2 RTT 25.97951889038086 millisec
Ping 3 RTT 23.445844650268555 millisec
Average RTT: 24.4446595509847 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 65.8.19.129
Pinging 65.8.19.129 [65.8.19.129] 3 times using Python:
Ping 1 RTT 8.962154388427734 millisec
Ping 2 RTT 7.734775543212891 millisec
Ping 3 RTT 46.16808891296387 millisec
Average RTT: 20.955006281534832 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 197.255.125.220
Pinging 197.255.125.220 [197.255.125.220] 3 times using Python:
Ping 1 RTT 189.61095809936523 millisec
Ping 2 RTT 191.36548042297363 millisec
Ping 3 RTT 188.92431259155273 millisec
Average RTT: 189.96691703796387 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 178.154.243.30
Pinging 178.154.243.30 [178.154.243.30] 3 times using Python:
Ping 1 RTT 146.0130214691162 millisec
Ping 2 RTT 143.55087280273438 millisec
Ping 3 RTT 141.33000373840332 millisec
Average RTT: 143.6312993367513 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 43.245.41.9
Pinging 43.245.41.9 [43.245.41.9] 3 times using Python:
Ping 1 RTT 6.387472152709961 millisec
Ping 2 RTT 11.035919189453125 millisec
Ping 3 RTT 9.476423263549805 millisec
Average RTT: 8.966604868570963 millisec

```
C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 43.245.41.9
Pinging 43.245.41.9 [43.245.41.9] 3 times using Python:
Ping 1 RTT 7.203578948974609 millisec
Ping 2 RTT 9.10496711730957 millisec
Ping 3 RTT 7.020235061645508 millisec
Average RTT: 7.7762603759765625 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 146.141.13.50
Pinging 146.141.13.50 [146.141.13.50] 3 times using Python:
Ping 1 RTT Request timed out. millisec
Traceback (most recent call last):
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 155, in
<module>
    ping(target)
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 141, in ping
    total_rtt += delay
TypeError: unsupported operand type(s) for +=: 'int' and 'str'

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 146.141.13.50
Pinging 146.141.13.50 [146.141.13.50] 3 times using Python:
Ping 1 RTT Request timed out. millisec
Traceback (most recent call last):
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 155, in
<module>
    ping(target)
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 141, in ping
    total_rtt += delay
TypeError: unsupported operand type(s) for +=: 'int' and 'str'

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 210.152.243.234
Pinging 210.152.243.234 [210.152.243.234] 3 times using Python:
Ping 1 RTT Request timed out. millisec
Traceback (most recent call last):
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 155, in
<module>
    ping(target)
  File "C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4\ICMPpinger.py", line 141, in ping
    total_rtt += delay
TypeError: unsupported operand type(s) for +=: 'int' and 'str'

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>ping 210.152.243.234

Pinging 210.152.243.234 with 32 bytes of data:
```

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 210.152.243.234:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

Since requests timed out to the last two IPs (for Witswatersand in South Africa and University of Tokyo in Japan. I also updated the code so that it doesn't run into an error when calculating the average RTT for a request that timed out.

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 129.187.255.109
Pinging 129.187.255.109 [129.187.255.109] 3 times using Python:
Ping 1 RTT 114.66026306152344 millisec
Ping 2 RTT 114.44282531738281 millisec
Ping 3 RTT 115.21553993225098 millisec
Average RTT: 114.77287610371907 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 4.224.55.79
Pinging 4.224.55.79 [4.224.55.79] 3 times using Python:
Ping 1 RTT 207.9169750213623 millisec
Ping 2 RTT 206.8314552307129 millisec
Ping 3 RTT 210.50095558166504 millisec
Average RTT: 208.41646194458008 millisec

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPpinger.py 131.229.65.117
Pinging 131.229.65.117 [131.229.65.117] 3 times using Python:
Ping 1 RTT 5.165576934814453 millisec
Ping 2 RTT 4.0683746337890625 millisec
Ping 3 RTT 5.953788757324219 millisec
Average RTT: 5.062580108642578 millisec

Traceroute

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
104.102.112.162
 1 rtt=7 ms 131.229.147.254 (Hostname not found)
 2 rtt=17 ms 131.229.11.142 (Hostname not found)

```
 3 rtt=21 ms 131.229.10.104 (Hostname not found)
 4 rtt=4 ms 134.241.249.33 (Hostname not found)
 5 rtt=5 ms 69.16.1.33 (Hostname not found)
 6 rtt=3 ms 18.2.136.89 (umassnet-cps2-nox-mghpcc-gw1.nox.org)
 7 rtt=10 ms 192.5.89.57 (Hostname not found)
 8 rtt=11 ms 206.53.143.2 (ae4.ecx-bos2.netarch.akamai.com)
 9 rtt=9 ms 104.102.112.162 (a104-102-112-162.deploy.static.akamaitechnologies.com)

Total RTT: 87 ms

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
104.102.112.162
Traceback (most recent call last):
  File "C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4\ICMPtraceroute.py", line 148, in
<module>
    get_route(target)
  File "C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4\ICMPtraceroute.py", line 107, in
get_route
    types, code, checksum, packetID, sequence = struct.unpack("bbHHh", icmpHeader)
                                                 ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
KeyboardInterrupt
^C
C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
171.67.215.200
 1 rtt=9 ms 131.229.147.254 (Hostname not found)
 2 rtt=27 ms 131.229.11.142 (Hostname not found)
 3 rtt=25 ms 131.229.10.104 (Hostname not found)
 4 rtt=4 ms 134.241.249.33 (Hostname not found)
 5 rtt=5 ms 69.16.1.33 (Hostname not found)
 6 rtt=3 ms 18.2.8.89 (umassnet-re2-nox-mghpcc-gw1.nox.org)
 7 rtt=9 ms 192.5.89.254 (nox-mghpcc-gw1-i2-re-chic.nox.org)
 8 rtt=71 ms 163.253.1.21 (fourhundredge-0-0-0-2.4079.core2.clev.net.internet2.edu)
 9 rtt=71 ms 163.253.2.144 (fourhundredge-0-0-0-22.4079.core1.clev.net.internet2.edu)
 10 rtt=70 ms 163.253.1.211 (fourhundredge-0-0-0-2.4079.core1.eqch.net.internet2.edu)
 11 rtt=72 ms 163.253.1.206 (fourhundredge-0-0-0-1.4079.core1.chic.net.internet2.edu)
 12 rtt=70 ms 163.253.2.29 (fourhundredge-0-0-0-1.4079.core2.kans.net.internet2.edu)
 13 rtt=68 ms 163.253.1.250 (fourhundredge-0-0-0-1.4079.core2.denv.net.internet2.edu)
 14 rtt=70 ms 163.253.1.169 (fourhundredge-0-0-0-3.4079.core2.salt.net.internet2.edu)
 15 rtt=70 ms 163.253.1.186 (fourhundredge-0-0-0-2.4079.core2.sacr.net.internet2.edu)
 16 rtt=71 ms 163.253.1.38 (fourhundredge-0-0-0-23.4079.core1.sacr.net.internet2.edu)
 17 rtt=71 ms 163.253.1.193 (fourhundredge-0-0-0-0.4079.core1.sunn.net.internet2.edu)
 18 rtt=69 ms 137.164.26.126 (hpr-svl-agg10--internet2r&e-100ge.cenic.net)
 19 rtt=68 ms 137.164.25.95 (hpr-oak-agg8--svl-hpr3-100g.cenic.net)
 20 rtt=70 ms 137.164.25.77 (oak-agg8-hpr--emvl1-agg-01-hpr--100g--01.cenic.net)
```

21 rtt=71 ms 137.164.26.241 (Hostname not found)
22 rtt=68 ms 171.66.255.200 (campus-ial-nets-b-vl1104.SUNet)
* * * Request timed out.
* * * Request timed out.
24 rtt=68 ms 171.67.215.200 (web.stanford.edu)

Total RTT: 1199 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 20.225.32.183
 1 rtt=12 ms 131.229.147.254 (Hostname not found)
 2 rtt=16 ms 131.229.11.142 (Hostname not found)
 3 rtt=22 ms 131.229.10.104 (Hostname not found)
 4 rtt=3 ms 134.241.249.33 (Hostname not found)
 5 rtt=6 ms 69.16.1.33 (Hostname not found)
 6 rtt=5 ms 18.2.136.89 (umassnet-cps2-nox-mghpcc-gw1.nox.org)
 7 rtt=8 ms 192.5.89.57 (Hostname not found)
 8 rtt=2 ms 206.53.143.7 (massix.bos01-96e-1.ntwk.msn.net)
 9 rtt=16 ms 104.44.231.118 (ae28-0.ear05.nyc30.ntwk.msn.net)
* * * Request timed out.
* * * Request timed out.
 11 rtt=69 ms 104.44.28.55 (be-9-0.ibr04.bl20.ntwk.msn.net)
 12 rtt=54 ms 104.44.30.120 (be-8-0.ibr02.bn6.ntwk.msn.net)
 13 rtt=60 ms 104.44.29.181 (be-7-0.ibr02.atl30.ntwk.msn.net)
 14 rtt=55 ms 104.44.28.226 (be-11-0.ibr02.sn1.ntwk.msn.net)
 15 rtt=54 ms 104.44.23.68 (ae122-0.icr02.sn1.ntwk.msn.net)
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
 21 rtt=58 ms 20.225.32.183 (Hostname not found)

Total RTT: 440 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 128.2.42.52
 1 rtt=1 ms 131.229.147.254 (Hostname not found)
 2 rtt=18 ms 131.229.11.142 (Hostname not found)
 3 rtt=21 ms 131.229.10.104 (Hostname not found)
 4 rtt=4 ms 134.241.249.33 (Hostname not found)

5 rtt=8 ms 69.16.1.33 (Hostname not found)
6 rtt=3 ms 18.2.8.89 (umassnet-re2-nox-mghpcc-gw1.nox.org)
7 rtt=8 ms 192.5.89.57 (Hostname not found)
8 rtt=10 ms 192.5.89.222 (i2-re-nox300gw1.nox.org)
9 rtt=7 ms 163.253.1.241 (fourhundredge-0-0-0-0.4079.core1.phil.net.internet2.edu)
10 rtt=3 ms 163.253.5.33 (Hostname not found)
11 rtt=25 ms 162.223.17.79 (162-223-17-79.static.firstlight.net)
12 rtt=24 ms 128.2.0.181 (CORE0-POD-I-DCNS-8500.GW.CMU.NET)
13 rtt=28 ms 128.2.0.202 (POD-D-CYH-CORE0.GW.CMU.NET)
14 rtt=31 ms 128.2.42.52 (WWW-CMU-PROD-VIP.ANDREW.CMU.EDU)

Total RTT: 191 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 65.8.19.129
 1 rtt=4 ms 131.229.147.254 (Hostname not found)
 2 rtt=6 ms 131.229.11.142 (Hostname not found)
 3 rtt=22 ms 131.229.10.104 (Hostname not found)
 4 rtt=4 ms 134.241.249.33 (Hostname not found)
 5 rtt=2 ms 69.16.1.33 (Hostname not found)
 6 rtt=1 ms 65.175.24.205 (ae6-201.cr1-bos1.ip4.gtt.net)
 7 rtt=3 ms 89.149.130.30 (ae0.cr2-bos1.ip4.gtt.net)
 * * * Request timed out.
 * * * Request timed out.
 9 rtt=7 ms 52.93.76.141 (Hostname not found)
 10 rtt=14 ms 52.93.76.60 (Hostname not found)
 11 rtt=9 ms 150.222.71.89 (Hostname not found)
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 17 rtt=10 ms 65.8.19.129 (server-65-8-19-129.bos50.r.cloudfront.net)

Total RTT: 80 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
197.255.125.220
 1 rtt=0 ms 131.229.147.254 (Hostname not found)
 2 rtt=19 ms 131.229.11.142 (Hostname not found)

3 rtt=18 ms 131.229.10.104 (Hostname not found)
4 rtt=3 ms 134.241.249.33 (Hostname not found)
5 rtt=3 ms 69.16.1.33 (Hostname not found)
6 rtt=5 ms 18.2.8.89 (umassnet-re2-nox-mghpcc-gw1.nox.org)
7 rtt=7 ms 192.5.89.57 (Hostname not found)
8 rtt=3 ms 192.5.89.222 (i2-re-nox300gw1.nox.org)
9 rtt=8 ms 163.253.1.42 (fourhundredge-0-0-0-20.4079.core1.newy32aoa.net.internet2.edu)
10 rtt=70 ms 198.71.45.237 (Hostname not found)
11 rtt=99 ms 62.40.98.106 (ae8.mx1.lon2.uk.geant.net)
12 rtt=94 ms 62.40.98.64 (ae2.mx1.lon.uk.geant.net)
13 rtt=85 ms 62.40.125.234 (wacren-gw.mx1.lon.uk.geant.org)
14 rtt=204 ms 196.216.188.145 (if-xe-0-0-1-0.aggr-lag.as37288.wacren.net)
15 rtt=209 ms 196.216.188.129 (if-xe-0-1-0-0.aggr-acc.as37288.wacren.net)
16 rtt=204 ms 196.216.188.138 (if-xe-1-0-0-0.edge-acc.as37288.wacren.net)
17 rtt=199 ms 196.216.188.6 (garnet.edge-acc.as37288.wacren.net)
18 rtt=183 ms 169.239.248.66 (Hostname not found)
19 rtt=182 ms 197.255.127.3 (Hostname not found)
20 rtt=189 ms 197.255.127.43 (Hostname not found)
21 rtt=183 ms 197.255.125.220 (Hostname not found)

Total RTT: 1967 ms

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
178.154.243.30
 1 rtt=22 ms 131.229.147.254 (Hostname not found)
 2 rtt=28 ms 131.229.11.142 (Hostname not found)
 3 rtt=25 ms 131.229.10.104 (Hostname not found)
 4 rtt=5 ms 134.241.249.33 (Hostname not found)
 5 rtt=15 ms 69.16.1.33 (Hostname not found)
 6 rtt=8 ms 65.175.24.205 (ae6-201.cr1-bos1.ip4.gtt.net)
 7 rtt=8 ms 89.149.130.30 (ae0.cr2-bos1.ip4.gtt.net)
 8 rtt=6 ms 4.68.37.109 (lag-18.bear2.Boston1.Level3.net)
* * * Request timed out.
* * * Request timed out.
 10 rtt=18 ms 4.14.99.138 (CARQUADRIN.bear2.Washington111.Level3.net)
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.

```
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
20 rtt=132 ms 130.193.63.246 (Hostname not found)
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
 * * * Request timed out.
27 rtt=142 ms 178.154.243.30 (Hostname not found)

Total RTT: 409 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 43.245.41.9
 1 rtt=1 ms 131.229.147.254 (Hostname not found)
 2 rtt=51 ms 131.229.11.142 (Hostname not found)
 3 rtt=11 ms 131.229.10.104 (Hostname not found)
 4 rtt=0 ms 134.241.249.33 (Hostname not found)
 5 rtt=4 ms 69.16.1.33 (Hostname not found)
 6 rtt=2 ms 65.175.24.205 (ae6-201.cr1-bos1.ip4.gtt.net)
 7 rtt=7 ms 89.149.130.30 (ae0.cr2-bos1.ip4.gtt.net)
 8 rtt=5 ms 76.74.50.107 (Hostname not found)
 9 rtt=7 ms 43.245.41.9 (uom.squizedge.cloud)

Total RTT: 88 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 4.224.55.79
 1 rtt=3 ms 131.229.147.254 (Hostname not found)
 2 rtt=20 ms 131.229.11.142 (Hostname not found)
 3 rtt=25 ms 131.229.10.104 (Hostname not found)
 4 rtt=5 ms 134.241.249.33 (Hostname not found)
```

5 rtt=6 ms 69.16.1.33 (Hostname not found)
6 rtt=6 ms 18.2.136.89 (umassnet-cps2-nox-mghpcc-gw1.nox.org)
7 rtt=8 ms 192.5.89.57 (Hostname not found)
8 rtt=2 ms 206.53.143.7 (massix.bos01-96e-1.ntwk.msn.net)
9 rtt=11 ms 104.44.231.118 (ae28-0.ear05.nyc30.ntwk.msn.net)
10 rtt=206 ms 104.44.33.215 (be-24-0.ibr02.nyc30.ntwk.msn.net)
11 rtt=213 ms 104.44.18.155 (be-7-0.ibr02.lon22.ntwk.msn.net)
12 rtt=205 ms 104.44.7.50 (be-12-0.ibr02.par30.ntwk.msn.net)
13 rtt=275 ms 104.44.7.214 (be-1-0.ibr02.par21.ntwk.msn.net)
14 rtt=208 ms 104.44.18.7 (be-6-0.ibr02.gva20.ntwk.msn.net)
15 rtt=207 ms 104.44.29.58 (be-7-0.ibr02.mrs21.ntwk.msn.net)
* * * Request timed out.
16 rtt=201 ms 104.44.31.15 (Hostname not found)
17 rtt=208 ms 104.44.31.134 (Hostname not found)
18 rtt=197 ms 104.44.18.34 (be-1-0.ibr02.pnq21.ntwk.msn.net)
* * * Request timed out.
* * * Request timed out.
19 rtt=201 ms 104.44.21.22 (ae124-0.rwa03.pnq21.ntwk.msn.net)
Traceback (most recent call last):
  File "C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4\ICMPtraceroute.py", line 148, in
<module>
    get_route(target)
  File "C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4\ICMPtraceroute.py", line 78, in
get_route
    whatReady = select.select([mySocket], [], [], timeLeft)
                ^^^
ValueError: timeout must be non-negative

Updated my code by implementing Maggie Hollis' fix for this negative time issue

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 4.224.55.79
 1 rtt=5 ms 131.229.147.254 (Hostname not found)
 2 rtt=13 ms 131.229.11.142 (Hostname not found)
 3 rtt=16 ms 131.229.10.104 (Hostname not found)
 4 rtt=29 ms 134.241.249.33 (Hostname not found)
 5 rtt=4 ms 69.16.1.33 (Hostname not found)
 6 rtt=5 ms 18.2.136.89 (umassnet-cps2-nox-mghpcc-gw1.nox.org)
 7 rtt=7 ms 192.5.89.57 (Hostname not found)
 8 rtt=4 ms 206.53.143.7 (massix.bos01-96e-1.ntwk.msn.net)
 9 rtt=21 ms 104.44.231.118 (ae28-0.ear05.nyc30.ntwk.msn.net)
10 rtt=208 ms 104.44.33.215 (be-24-0.ibr02.nyc30.ntwk.msn.net)
11 rtt=193 ms 104.44.18.155 (be-7-0.ibr02.lon22.ntwk.msn.net)
12 rtt=206 ms 104.44.7.50 (be-12-0.ibr02.par30.ntwk.msn.net)
13 rtt=210 ms 104.44.7.214 (be-1-0.ibr02.par21.ntwk.msn.net)

14 rtt=197 ms 104.44.18.7 (be-6-0.ibr02.gva20.ntwk.msn.net)
15 rtt=206 ms 104.44.29.58 (be-7-0.ibr02.mrs21.ntwk.msn.net)
16 rtt=197 ms 104.44.31.15 (Hostname not found)
17 rtt=194 ms 104.44.31.134 (Hostname not found)
18 rtt=206 ms 104.44.18.34 (be-1-0.ibr02.pnq21.ntwk.msn.net)
* * * Request timed out.
* * * Request timed out.
19 rtt=200 ms 104.44.21.22 (ae124-0.rwa03.pnq21.ntwk.msn.net)
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
24 rtt=209 ms 4.224.55.79 (Hostname not found)

Total RTT: 2328 ms

C:\Users\LAWSON_l\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py
129.187.255.109
 1 rtt=9 ms 131.229.147.254 (Hostname not found)
 2 rtt=19 ms 131.229.11.142 (Hostname not found)
 3 rtt=17 ms 131.229.10.104 (Hostname not found)
 4 rtt=3 ms 134.241.249.33 (Hostname not found)
 5 rtt=2 ms 69.16.1.33 (Hostname not found)
 6 rtt=5 ms 18.2.8.89 (umassnet-re2-nox-mghpcc-gw1.nox.org)
 7 rtt=5 ms 192.5.89.57 (Hostname not found)
 8 rtt=10 ms 192.5.89.222 (i2-re-nox300gw1.nox.org)
 9 rtt=10 ms 163.253.1.44 (fourhundredge-0-0-0-21.4079.core1.newy32aoa.net.internet2.edu)
 10 rtt=81 ms 198.71.45.237 (Hostname not found)
 11 rtt=91 ms 62.40.98.238 (ae7.mx1.gen.ch.geant.net)
 12 rtt=110 ms 62.40.98.182 (ae5.rt1.fra.de.geant.net)
 13 rtt=104 ms 62.40.124.218 (dfn-gw.rt1.fra.de.geant.net)
 14 rtt=117 ms 188.1.145.230 (cr-gar1-be6.x-win.dfn.de)
 15 rtt=107 ms 188.1.37.90 (kr-gar188-0.x-win.dfn.de)
 16 rtt=112 ms 129.187.0.168 (vl-3001.cvr2-2wr.lrz.de)
 17 rtt=115 ms 129.187.255.109 (wwwv21.tum.de)

Total RTT: 916 ms

```
C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>python ICMPtraceroute.py 131.229.65.117
 1 rtt=10 ms 131.229.147.254 (Hostname not found)
 2 rtt=31 ms 131.229.11.142 (Hostname not found)
 3 rtt=4 ms 131.229.65.117 (bouncenode01.smith.edu)

Total RTT: 45 ms

C:\Users\LAWSON_I\Documents\GitHub\csc-249-p4>
```