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CSE 310

Programming Homework 3

Sending packets to localhost, 127.0.0.1:

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py 127.0.0.1
Password:
Pinging 127.0.0.1 using Python:
36 bytes from 127.0.0.1 : time = 0.0457763671875 ms
36 bytes from 127.0.0.1 : time = 0.05793571472167969 ms
36 bytes from 127.0.0.1 : time = 0.06103515625 ms
36 bytes from 127.0.0.1 : time = 0.050067901611328125 ms
36 bytes from 127.0.0.1 : time = 0.07200241088867188 ms
36 bytes from 127.0.0.1 : time = 0.04792213439941406 ms
36 bytes from 127.0.0.1 : time = 0.04100799560546875 ms
36 bytes from 127.0.0.1 : time = 0.0362396240234375 ms
36 bytes from 127.0.0.1 : time = 0.08797645568847656 ms
36 bytes from 127.0.0.1 : time = 0.05817413330078125 ms
^C-----Ping statistics-----
Minimum ping: 0.06389617919921875 ms
Average ping: 0.09200572967529297 ms
Maximum ping: 0.10800361633300781 ms
```

Sending packets to stonybrook.edu:

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py stonybrook.edu
Pinging 172.30.32.25 using Python:
36 bytes from 172.30.32.25 : time = 2.027750015258789 ms
36 bytes from 172.30.32.25 : time = 1.3937950134277344 ms
36 bytes from 172.30.32.25 : time = 1.4698505401611328 ms
36 bytes from 172.30.32.25 : time = 1.3589859008789062 ms
36 bytes from 172.30.32.25 : time = 1.2290477752685547 ms
36 bytes from 172.30.32.25 : time = 0.90789794921875 ms
36 bytes from 172.30.32.25 : time = 0.9768009185791016 ms
36 bytes from 172.30.32.25 : time = 0.9250640869140625 ms
36 bytes from 172.30.32.25 : time = 0.8368492126464844 ms
36 bytes from 172.30.32.25 : time = 1.1599063873291016 ms
36 bytes from 172.30.32.25 : time = 0.9436607360839844 ms
36 bytes from 172.30.32.25 : time = 0.9591579437255859 ms
36 bytes from 172.30.32.25 : time = 0.8718967437744141 ms
^C-----Ping statistics-----
Minimum ping: 0.8902549743652344 ms
Average ping: 1.391007350041316 ms
Maximum ping: 2.7170181274414062 ms
```

Sending packets to 192.36.148.17 (Sweden)

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py 192.36.148.17
Password:
Pinging 192.36.148.17 using Python:
36 bytes from 192.36.148.17 : time = 21.149158477783203 ms
36 bytes from 192.36.148.17 : time = 21.203994750976562 ms
36 bytes from 192.36.148.17 : time = 21.25096321105957 ms
36 bytes from 192.36.148.17 : time = 21.31199836730957 ms
36 bytes from 192.36.148.17 : time = 21.127939224243164 ms
36 bytes from 192.36.148.17 : time = 20.98393440246582 ms
36 bytes from 192.36.148.17 : time = 21.094083786010742 ms
36 bytes from 192.36.148.17 : time = 20.904064178466797 ms
36 bytes from 192.36.148.17 : time = 20.97296714782715 ms
36 bytes from 192.36.148.17 : time = 21.38686180114746 ms
36 bytes from 192.36.148.17 : time = 21.08001708984375 ms
^C-----Ping statistics-----
Minimum ping: 21.02184295654297 ms
Average ping: 21.282239393754438 ms
Maximum ping: 21.625757217407227 ms
```

Sending packets to 193.0.14.129 (Netherlands)

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py 193.0.14.129
Pinging 193.0.14.129 using Python:
36 bytes from 193.0.14.129 : time = 90.24310111999512 ms
36 bytes from 193.0.14.129 : time = 90.15917778015137 ms
36 bytes from 193.0.14.129 : time = 90.17586708068848 ms
36 bytes from 193.0.14.129 : time = 90.11006355285645 ms
36 bytes from 193.0.14.129 : time = 90.03376960754395 ms
36 bytes from 193.0.14.129 : time = 89.95509147644043 ms
36 bytes from 193.0.14.129 : time = 90.00205993652344 ms
36 bytes from 193.0.14.129 : time = 90.25907516479492 ms
36 bytes from 193.0.14.129 : time = 90.14511108398438 ms
36 bytes from 193.0.14.129 : time = 89.93196487426758 ms
36 bytes from 193.0.14.129 : time = 90.2559757232666 ms
36 bytes from 193.0.14.129 : time = 89.96009826660156 ms
^C-----Ping statistics-----
Minimum ping: 89.91718292236328 ms
Average ping: 90.17594655354817 ms
Maximum ping: 90.46506881713867 ms
```

Sending packets to 202.12.27.33 (Japan)

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py 202.12.27.33
Pinging 202.12.27.33 using Python:
36 bytes from 202.12.27.33 : time = 75.89888572692871 ms
36 bytes from 202.12.27.33 : time = 75.54817199707031 ms
36 bytes from 202.12.27.33 : time = 75.65426826477051 ms
36 bytes from 202.12.27.33 : time = 75.5157470703125 ms
36 bytes from 202.12.27.33 : time = 75.61922073364258 ms
36 bytes from 202.12.27.33 : time = 75.32906532287598 ms
36 bytes from 202.12.27.33 : time = 75.40082931518555 ms
36 bytes from 202.12.27.33 : time = 75.46114921569824 ms
36 bytes from 202.12.27.33 : time = 75.42300224304199 ms
36 bytes from 202.12.27.33 : time = 75.41012763977051 ms
36 bytes from 202.12.27.33 : time = 75.4709243774414 ms
36 bytes from 202.12.27.33 : time = 75.43420791625977 ms
^C-----Ping statistics-----
Minimum ping: 75.3629207611084 ms
Average ping: 75.5581259727478 ms
Maximum ping: 75.97994804382324 ms
```

Sending packets to 198.41.0.4 (Virginia, United States)

```
angel@Angels-MacBook-Pro ~ % sudo python3 sample_pinger.py 198.41.0.4
Pinging 198.41.0.4 using Python:
36 bytes from 198.41.0.4 : time = 6.3610076904296875 ms
36 bytes from 198.41.0.4 : time = 5.337953567504883 ms
36 bytes from 198.41.0.4 : time = 5.856990814208984 ms
36 bytes from 198.41.0.4 : time = 5.668163299560547 ms
36 bytes from 198.41.0.4 : time = 5.39708137512207 ms
36 bytes from 198.41.0.4 : time = 5.950927734375 ms
36 bytes from 198.41.0.4 : time = 6.107091903686523 ms
36 bytes from 198.41.0.4 : time = 5.2700042724609375 ms
36 bytes from 198.41.0.4 : time = 6.149053573608398 ms
36 bytes from 198.41.0.4 : time = 5.157232284545898 ms
^C-----Ping statistics-----
Minimum ping: 5.341768264770508 ms
Average ping: 5.652618408203125 ms
Maximum ping: 6.138324737548828 ms
```

I tried pinging localhost, stonybrook.edu, and 4 root servers. Of the 4 root servers, I only found 3 root servers that were outside of the United States. In order, the root servers that I tried running sample_pinger.py on were Sweden, Netherlands, Japan, and Virginia, US. The minimum round trip times were all very different. When I tried testing out the pinger on localhost, the minimum time was 0.06 ms. When I tried pinging stonybrook.edu, the minimum round trip time was 0.89 ms. When I tried pinging Sweden, Netherlands, Japan, and Virginia, the minimum round trip times were 21.02 ms, 89.17 ms, 75.36 ms, and 5.34 ms, respectively. Testing the pinger on my IP address and Stonybrook.edu was the smallest because ping increases the further the host is from my computer. Given that the distance is not significant from the host I need to reach and my computer, the round trip times were relatively small. Testing the pinger on the four root servers, it is apparent the round trip times increase. It takes a greater amount of time to reach the host across the IP network because the root servers are geographically far away.