

Casey Levy

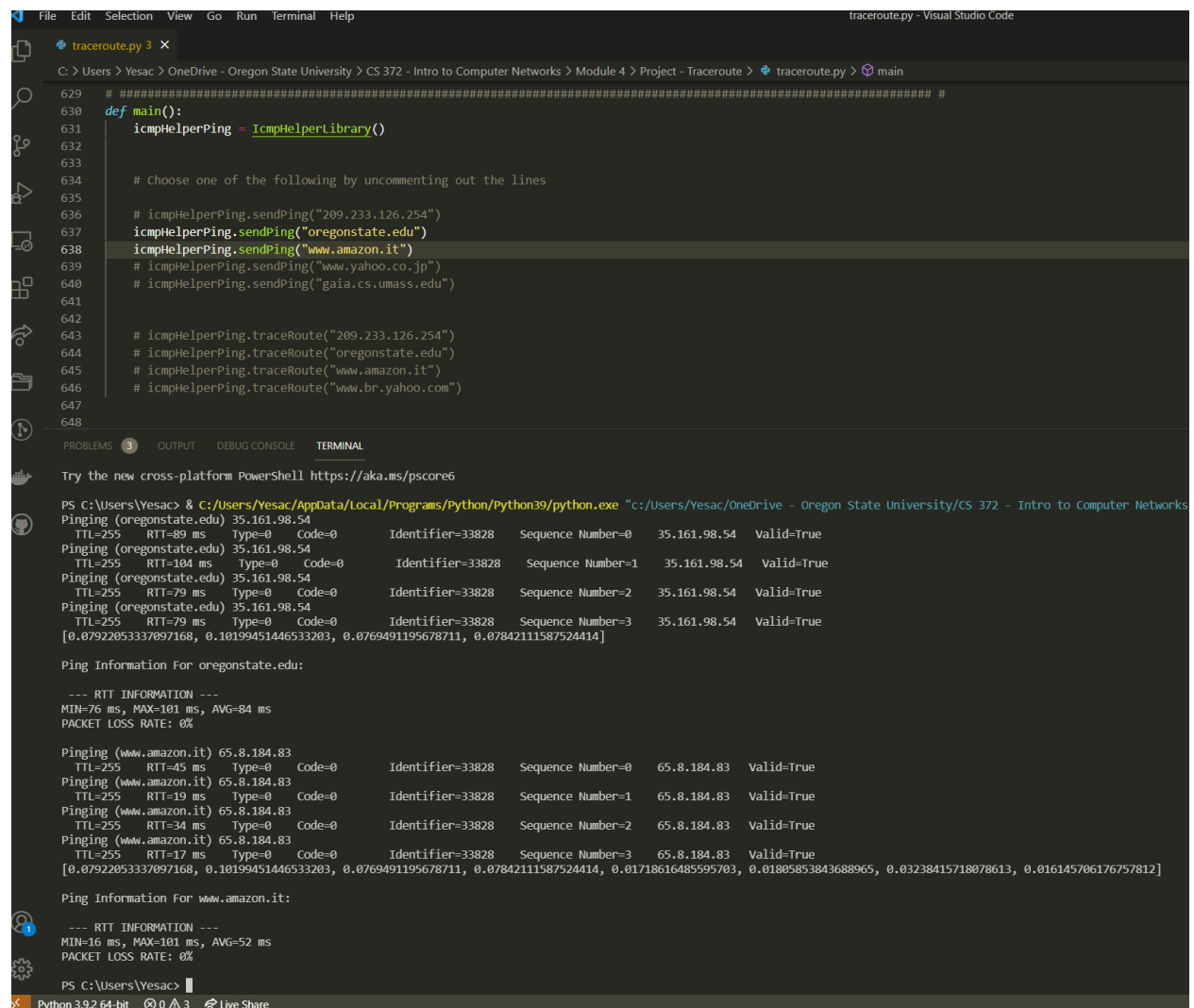
CS 372 – Project: Traceroute

My code was written in Python 3 in Visual Studio Code and I ran my code using the “run code” button at the top of the editor. You can also run the code using the command “py traceroute.py”. If this command doesn’t work, “python3 traceroute.py” may also work on other machines.

To run the code on a specific website, uncomment the line of code you wish to execute at the bottom of the code/file. Or if you’d like to run it using your own website, add the line of code to the bottom of the file just under the “main” function definition.

Ping Screenshots

www.oregonstate.edu and www.amazon.it



```
File Edit Selection View Go Run Terminal Help
traceroute.py - Visual Studio Code

traceroute.py 3 X
C: > Users > Yesac > OneDrive - Oregon State University > CS 372 - Intro to Computer Networks > Module 4 > Project - Traceroute > traceroute.py > main

629 # =====
630 def main():
631     icmpHelperPing = IcmpHelperLibrary()
632
633     # Choose one of the following by uncommenting out the lines
634
635     # icmpHelperPing.sendPing("209.233.126.254")
636     icmpHelperPing.sendPing("oregonstate.edu")
637     icmpHelperPing.sendPing("www.amazon.it")
638     # icmpHelperPing.sendPing("www.yahoo.co.jp")
639     # icmpHelperPing.sendPing("gaia.cs.umass.edu")
640
641     # icmpHelperPing.traceRoute("209.233.126.254")
642     # icmpHelperPing.traceRoute("oregonstate.edu")
643     # icmpHelperPing.traceRoute("www.amazon.it")
644     # icmpHelperPing.traceRoute("www.br.yahoo.com")
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PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Yesac> & C:\Users\Yesac\AppData\Local\Programs\Python\Python39\python.exe "c:\Users\Yesac\OneDrive - Oregon State University\CS 372 - Intro to Computer Networks
Ping (oregonstate.edu) 35.161.98.54
TTL=255 RTT=89 ms Type=0 Code=0 Identifier=33828 Sequence Number=0 35.161.98.54 Valid=True
Ping (oregonstate.edu) 35.161.98.54
TTL=255 RTT=104 ms Type=0 Code=0 Identifier=33828 Sequence Number=1 35.161.98.54 Valid=True
Ping (oregonstate.edu) 35.161.98.54
TTL=255 RTT=79 ms Type=0 Code=0 Identifier=33828 Sequence Number=2 35.161.98.54 Valid=True
Ping (oregonstate.edu) 35.161.98.54
TTL=255 RTT=79 ms Type=0 Code=0 Identifier=33828 Sequence Number=3 35.161.98.54 Valid=True
[0.07922053337097168, 0.10199451446533203, 0.0769491195678711, 0.07842111587524414]

Ping Information For oregonstate.edu:

--- RTT INFORMATION ---
MIN=76 ms, MAX=101 ms, AVG=84 ms
PACKET LOSS RATE: 0%

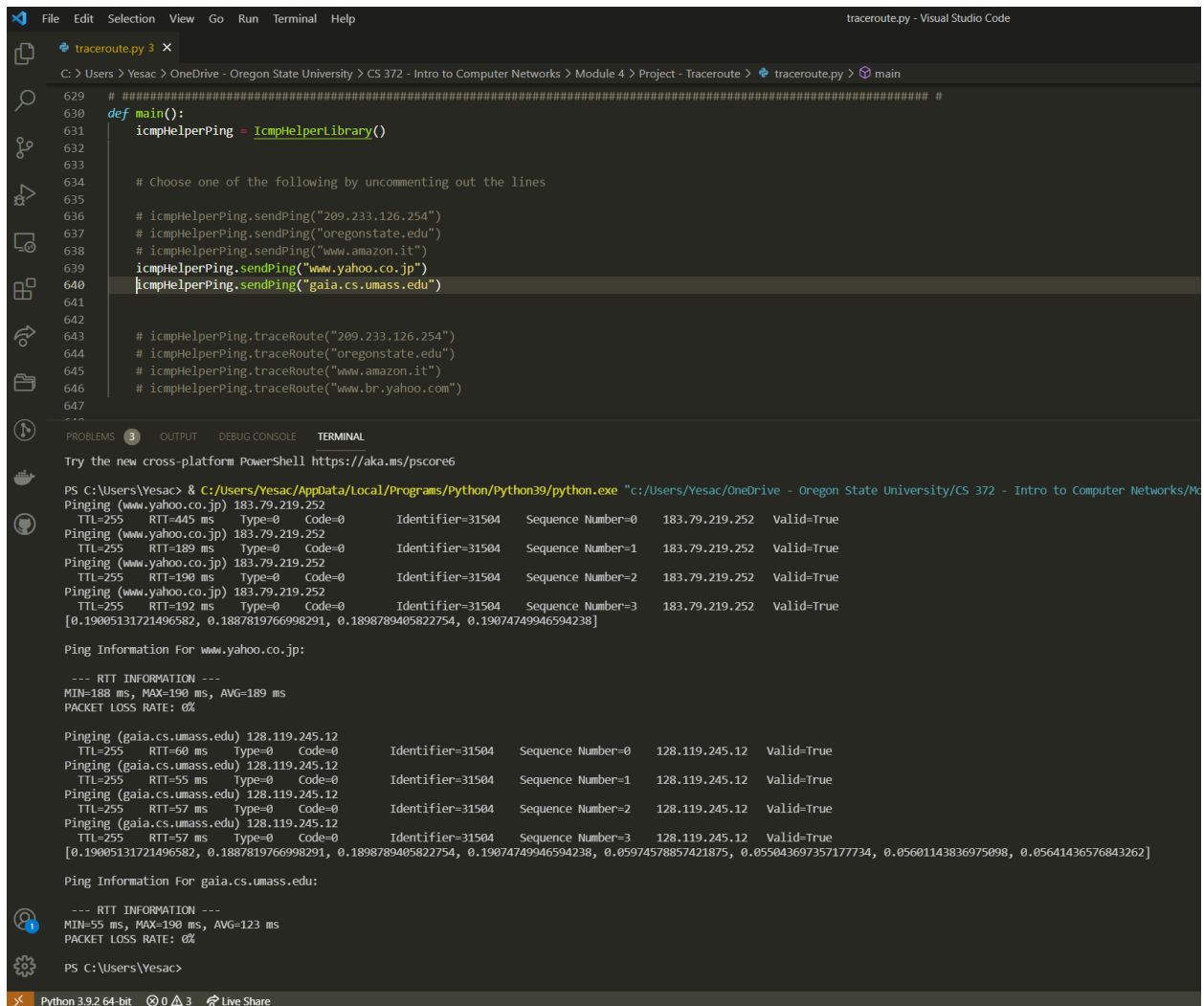
Ping (www.amazon.it) 65.8.184.83
TTL=255 RTT=45 ms Type=0 Code=0 Identifier=33828 Sequence Number=0 65.8.184.83 Valid=True
Ping (www.amazon.it) 65.8.184.83
TTL=255 RTT=19 ms Type=0 Code=0 Identifier=33828 Sequence Number=1 65.8.184.83 Valid=True
Ping (www.amazon.it) 65.8.184.83
TTL=255 RTT=34 ms Type=0 Code=0 Identifier=33828 Sequence Number=2 65.8.184.83 Valid=True
Ping (www.amazon.it) 65.8.184.83
TTL=255 RTT=17 ms Type=0 Code=0 Identifier=33828 Sequence Number=3 65.8.184.83 Valid=True
[0.07922053337097168, 0.10199451446533203, 0.0769491195678711, 0.07842111587524414, 0.01718616485595703, 0.01805853843688965, 0.03238415718078613, 0.016145706176757812]

Ping Information For www.amazon.it:

--- RTT INFORMATION ---
MIN=16 ms, MAX=101 ms, AVG=52 ms
PACKET LOSS RATE: 0%

PS C:\Users\Yesac>
```

www.yahoo.co.jp and gaia.cs.umass.edu



The screenshot shows a Visual Studio Code editor window with a file named `traceroute.py`. The script is a Python program that uses the `icmpHelperLibrary` to send ping requests and trace routes to various destinations. The destinations listed in the script are `209.233.126.254`, `oregonstate.edu`, `www.amazon.it`, `www.yahoo.co.jp`, and `gaia.cs.umass.edu`. The script is currently set to ping `www.yahoo.co.jp` and trace the route to `gaia.cs.umass.edu`.

```
629 # #####
630 def main():
631     icmpHelperPing = IcmpHelperLibrary()
632
633     # Choose one of the following by uncommenting out the lines
634
635     # icmpHelperPing.sendPing("209.233.126.254")
636     # icmpHelperPing.sendPing("oregonstate.edu")
637     # icmpHelperPing.sendPing("www.amazon.it")
638     icmpHelperPing.sendPing("www.yahoo.co.jp")
639     # icmpHelperPing.sendPing("gaia.cs.umass.edu")
640
641
642     # icmpHelperPing.traceRoute("209.233.126.254")
643     # icmpHelperPing.traceRoute("oregonstate.edu")
644     # icmpHelperPing.traceRoute("www.amazon.it")
645     # icmpHelperPing.traceRoute("www.br.yahoo.com")
646
647
```

The terminal output shows the results of the ping and trace route commands. The ping command for `www.yahoo.co.jp` shows a successful connection with a response time of 183.79.219.252 ms. The trace route command for `gaia.cs.umass.edu` shows a successful connection with a response time of 128.119.245.12 ms.

```
PS C:\Users\Yesac> & C:\Users\Yesac\AppData\Local\Programs\Python\Python39\python.exe "c:/Users/Yesac/OneDrive - Oregon State University/CS 372 - Intro to Computer Networks/M
Ping (www.yahoo.co.jp) 183.79.219.252
TTL=255 RTT=445 ms Type=0 Code=0 Identifier=31504 Sequence Number=0 183.79.219.252 Valid=True
Ping (www.yahoo.co.jp) 183.79.219.252
TTL=255 RTT=189 ms Type=0 Code=0 Identifier=31504 Sequence Number=1 183.79.219.252 Valid=True
Ping (www.yahoo.co.jp) 183.79.219.252
TTL=255 RTT=190 ms Type=0 Code=0 Identifier=31504 Sequence Number=2 183.79.219.252 Valid=True
Ping (www.yahoo.co.jp) 183.79.219.252
TTL=255 RTT=192 ms Type=0 Code=0 Identifier=31504 Sequence Number=3 183.79.219.252 Valid=True
[0.19005131721496582, 0.1887819766998291, 0.1898789405822754, 0.19074749946594238]

Ping Information For www.yahoo.co.jp:

--- RTT INFORMATION ---
MIN=188 ms, MAX=190 ms, AVG=189 ms
PACKET LOSS RATE: 0%

Ping (gaia.cs.umass.edu) 128.119.245.12
TTL=255 RTT=60 ms Type=0 Code=0 Identifier=31504 Sequence Number=0 128.119.245.12 Valid=True
Ping (gaia.cs.umass.edu) 128.119.245.12
TTL=255 RTT=55 ms Type=0 Code=0 Identifier=31504 Sequence Number=1 128.119.245.12 Valid=True
Ping (gaia.cs.umass.edu) 128.119.245.12
TTL=255 RTT=57 ms Type=0 Code=0 Identifier=31504 Sequence Number=2 128.119.245.12 Valid=True
Ping (gaia.cs.umass.edu) 128.119.245.12
TTL=255 RTT=57 ms Type=0 Code=0 Identifier=31504 Sequence Number=3 128.119.245.12 Valid=True
[0.19005131721496582, 0.1887819766998291, 0.1898789405822754, 0.19074749946594238, 0.05974578857421875, 0.055043697357177734, 0.05601143836975098, 0.05641436576843262]

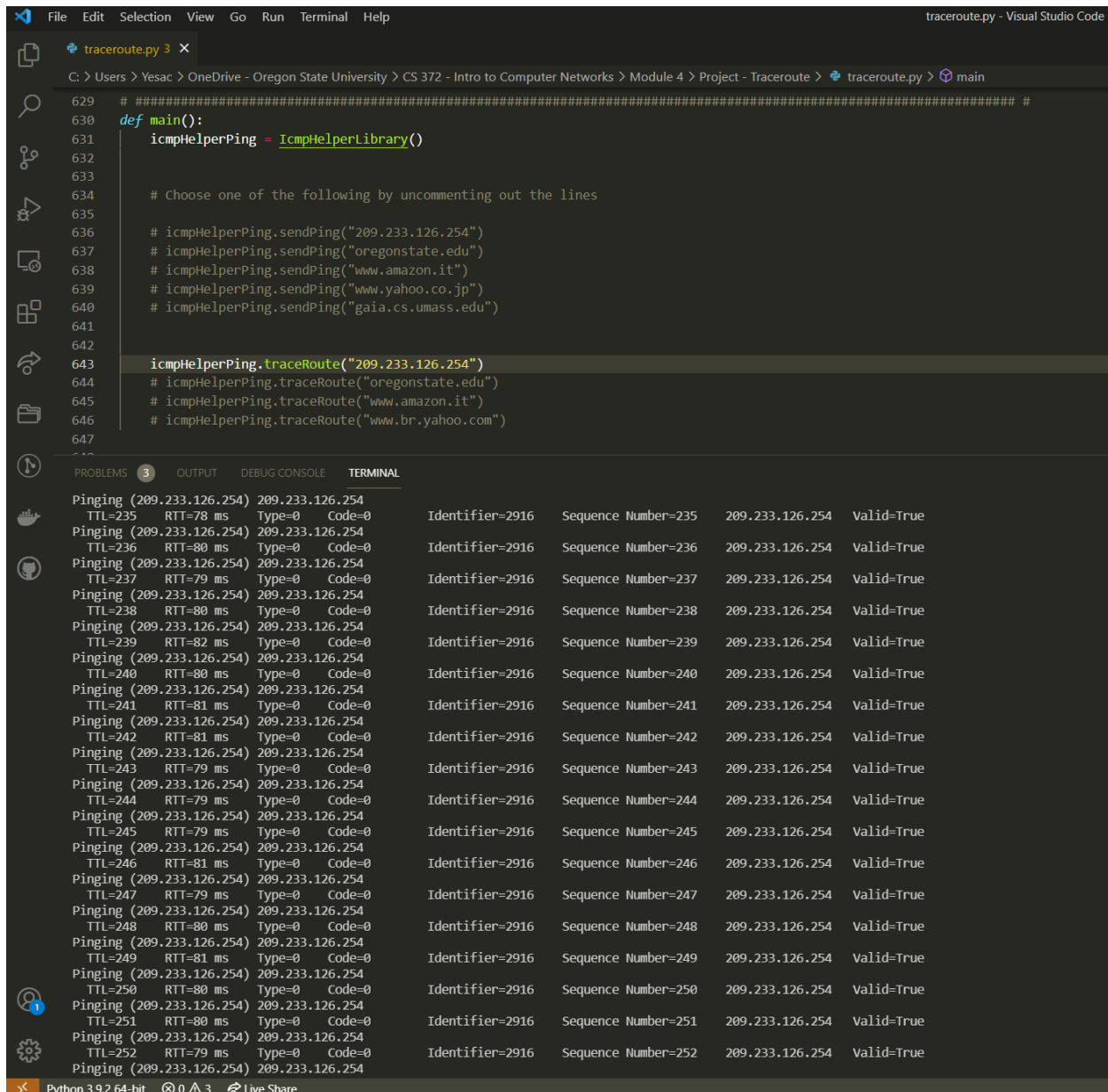
Ping Information For gaia.cs.umass.edu:

--- RTT INFORMATION ---
MIN=55 ms, MAX=190 ms, AVG=123 ms
PACKET LOSS RATE: 0%

PS C:\Users\Yesac>
```

Traceroute Screenshots

209.233.126.254



The screenshot shows a Visual Studio Code editor window with a Python file named `traceroute.py`. The script defines a `main()` function that uses the `icmpHelperLibrary` to perform a traceroute to the IP address `209.233.126.254`. The script includes several commented-out lines for other destinations and a line to uncomment for the current target.

```
def main():
    icmpHelperPing = IcmpHelperLibrary()

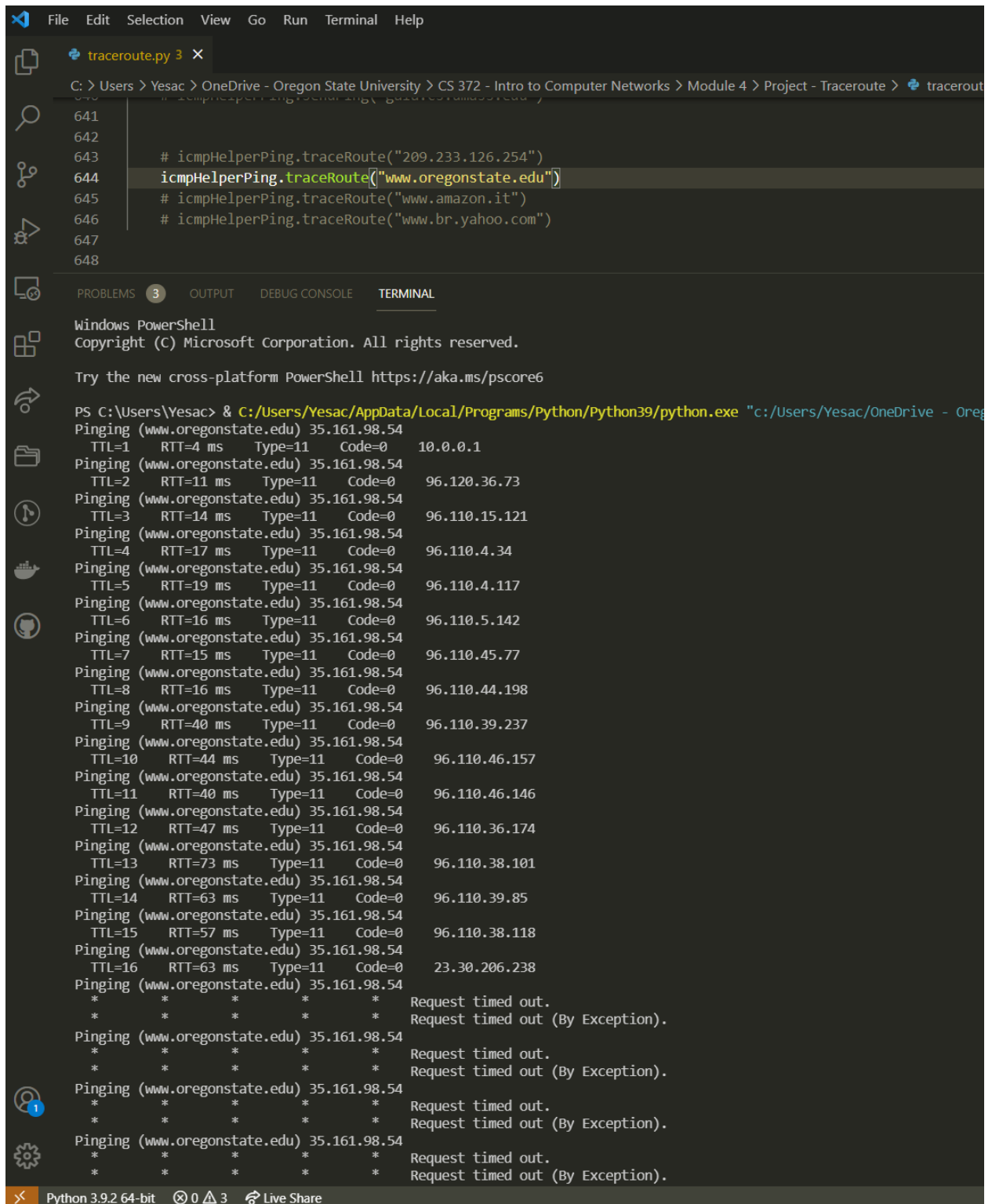
    # Choose one of the following by uncommenting out the lines

    # icmpHelperPing.sendPing("209.233.126.254")
    # icmpHelperPing.sendPing("oregonstate.edu")
    # icmpHelperPing.sendPing("www.amazon.it")
    # icmpHelperPing.sendPing("www.yahoo.co.jp")
    # icmpHelperPing.sendPing("gaia.cs.umass.edu")

    icmpHelperPing.traceRoute("209.233.126.254")
    # icmpHelperPing.traceRoute("oregonstate.edu")
    # icmpHelperPing.traceRoute("www.amazon.it")
    # icmpHelperPing.traceRoute("www.br.yahoo.com")
```

The terminal output shows the results of the traceroute, displaying the sequence number, TTL, RTT, and the IP address of each hop. The output is as follows:

Sequence Number	TTL	RTT	IP Address
235	235	78 ms	209.233.126.254
236	236	80 ms	209.233.126.254
237	237	79 ms	209.233.126.254
238	238	80 ms	209.233.126.254
239	239	82 ms	209.233.126.254
240	240	80 ms	209.233.126.254
241	241	81 ms	209.233.126.254
242	242	81 ms	209.233.126.254
243	243	79 ms	209.233.126.254
244	244	79 ms	209.233.126.254
245	245	79 ms	209.233.126.254
246	246	81 ms	209.233.126.254
247	247	79 ms	209.233.126.254
248	248	80 ms	209.233.126.254
249	249	81 ms	209.233.126.254
250	250	80 ms	209.233.126.254
251	251	80 ms	209.233.126.254
252	252	79 ms	209.233.126.254



The screenshot shows a Visual Studio Code editor window with a Python file named `traceroute.py` open. The file contains several lines of code, with line 644 highlighted: `icmpHelperPing.traceRoute("www.oregonstate.edu")`. The interface includes a sidebar with icons for Explorer, Search, Source Control, and Run and Debug. The main editor area shows the code, and the bottom panel displays the 'TERMINAL' output.

The terminal output shows the execution of the script in a Windows PowerShell environment. It starts with the command `PS C:\Users\Yesac> & C:/Users/Yesac/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Yesac/OneDrive - Oregon State University/CS 372 - Intro to Computer Networks/Module 4/Project - Traceroute/traceroute.py"`. The output shows a series of ping attempts to `www.oregonstate.edu` with increasing TTL values from 1 to 16. Each attempt shows the IP address `35.161.98.54` and various RTT and Type values. After TTL 16, the output shows "Request timed out. Request timed out (By Exception)." for the remaining TTL values (17 to 20).

```
641
642
643 # icmpHelperPing.traceRoute("209.233.126.254")
644 icmpHelperPing.traceRoute("www.oregonstate.edu")
645 # icmpHelperPing.traceRoute("www.amazon.it")
646 # icmpHelperPing.traceRoute("www.br.yahoo.com")
647
648
```

Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

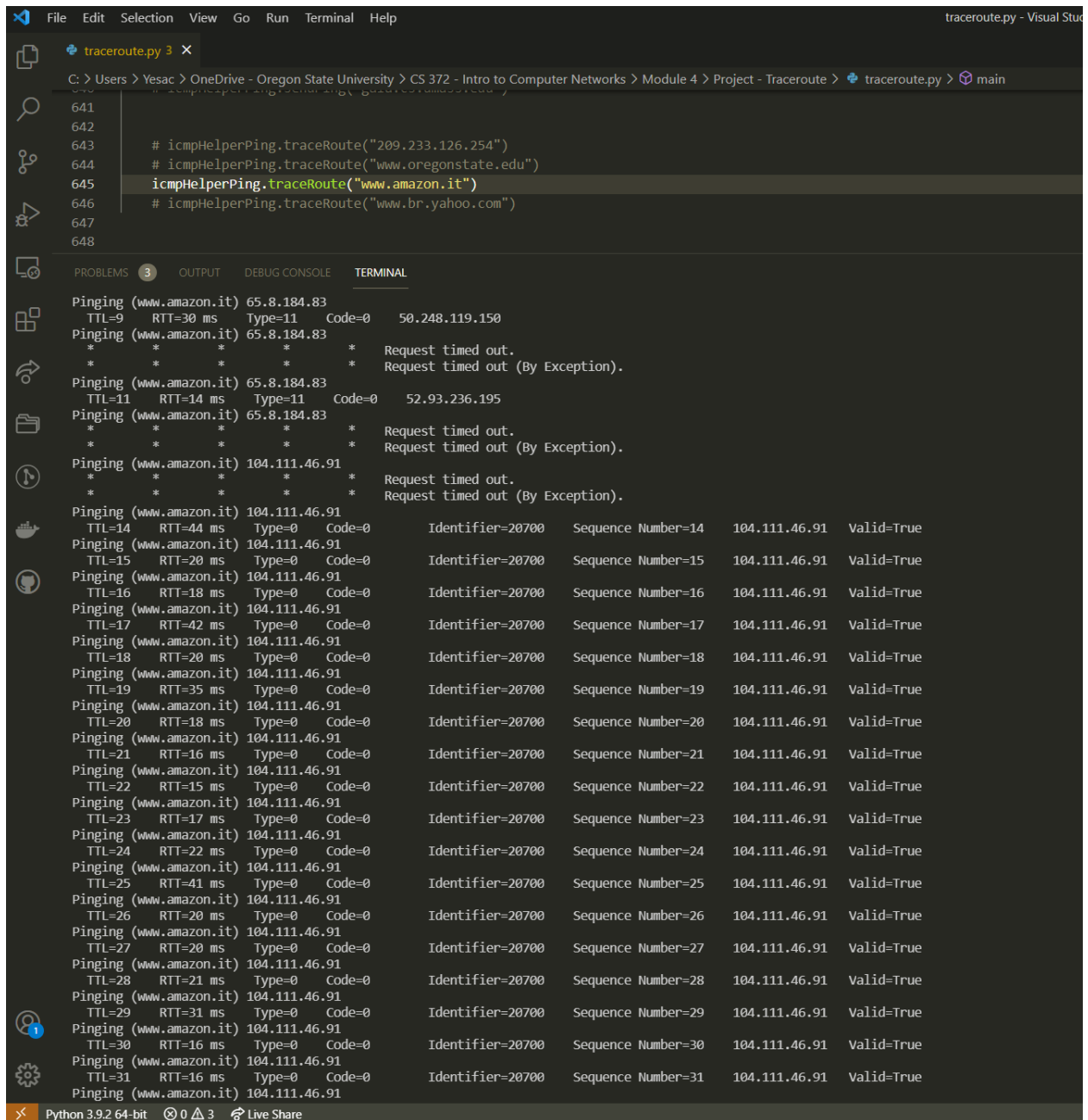
Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\Users\Yesac> & C:/Users/Yesac/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Yesac/OneDrive - Oregon State University/CS 372 - Intro to Computer Networks/Module 4/Project - Traceroute/traceroute.py"

Pinging (www.oregonstate.edu) 35.161.98.54
TTL=1 RTT=4 ms Type=11 Code=0 10.0.0.1
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=2 RTT=11 ms Type=11 Code=0 96.120.36.73
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=3 RTT=14 ms Type=11 Code=0 96.110.15.121
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=4 RTT=17 ms Type=11 Code=0 96.110.4.34
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=5 RTT=19 ms Type=11 Code=0 96.110.4.117
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=6 RTT=16 ms Type=11 Code=0 96.110.5.142
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=7 RTT=15 ms Type=11 Code=0 96.110.45.77
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=8 RTT=16 ms Type=11 Code=0 96.110.44.198
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=9 RTT=40 ms Type=11 Code=0 96.110.39.237
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=10 RTT=44 ms Type=11 Code=0 96.110.46.157
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=11 RTT=40 ms Type=11 Code=0 96.110.46.146
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=12 RTT=47 ms Type=11 Code=0 96.110.36.174
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=13 RTT=73 ms Type=11 Code=0 96.110.38.101
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=14 RTT=63 ms Type=11 Code=0 96.110.39.85
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=15 RTT=57 ms Type=11 Code=0 96.110.38.118
Pinging (www.oregonstate.edu) 35.161.98.54
TTL=16 RTT=63 ms Type=11 Code=0 23.30.206.238
Pinging (www.oregonstate.edu) 35.161.98.54
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.oregonstate.edu) 35.161.98.54
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.oregonstate.edu) 35.161.98.54
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.oregonstate.edu) 35.161.98.54
* * * * * Request timed out.
* * * * * Request timed out (By Exception).

Python 3.9.2 64-bit 0 3 Live Share

www.amazon.it



The screenshot displays a Visual Studio Code editor window with a Python script named `traceroute.py` open. The script is located at `C:\Users\Yesac\OneDrive - Oregon State University\CS 372 - Intro to Computer Networks\Module 4\Project - Traceroute\traceroute.py`. The script contains the following code:

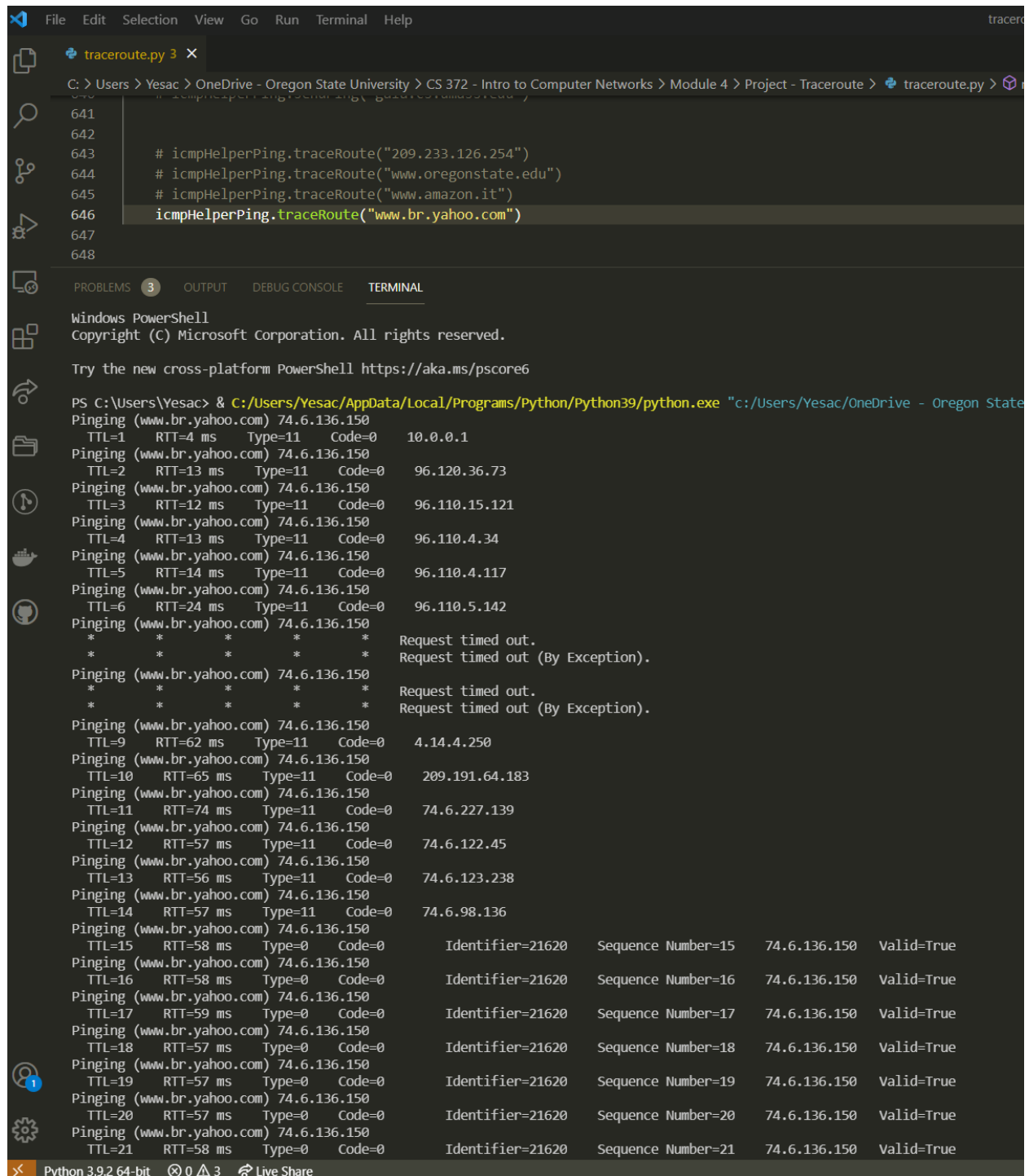
```
641
642
643 # icmpHelperPing.traceRoute("209.233.126.254")
644 # icmpHelperPing.traceRoute("www.oregonstate.edu")
645 icmpHelperPing.traceRoute("www.amazon.it")
646 # icmpHelperPing.traceRoute("www.br.yahoo.com")
647
648
```

The terminal output shows the results of the trace for `www.amazon.it`. The output is as follows:

```
Pinging (www.amazon.it) 65.8.184.83
TTL=9 RTT=30 ms Type=11 Code=0 50.248.119.150
Pinging (www.amazon.it) 65.8.184.83
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.amazon.it) 65.8.184.83
TTL=11 RTT=14 ms Type=11 Code=0 52.93.236.195
Pinging (www.amazon.it) 65.8.184.83
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.amazon.it) 104.111.46.91
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.amazon.it) 104.111.46.91
TTL=14 RTT=44 ms Type=0 Code=0 Identifier=20700 Sequence Number=14 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=15 RTT=20 ms Type=0 Code=0 Identifier=20700 Sequence Number=15 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=16 RTT=18 ms Type=0 Code=0 Identifier=20700 Sequence Number=16 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=17 RTT=42 ms Type=0 Code=0 Identifier=20700 Sequence Number=17 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=18 RTT=20 ms Type=0 Code=0 Identifier=20700 Sequence Number=18 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=19 RTT=35 ms Type=0 Code=0 Identifier=20700 Sequence Number=19 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=20 RTT=18 ms Type=0 Code=0 Identifier=20700 Sequence Number=20 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=21 RTT=16 ms Type=0 Code=0 Identifier=20700 Sequence Number=21 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=22 RTT=15 ms Type=0 Code=0 Identifier=20700 Sequence Number=22 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=23 RTT=17 ms Type=0 Code=0 Identifier=20700 Sequence Number=23 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=24 RTT=22 ms Type=0 Code=0 Identifier=20700 Sequence Number=24 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=25 RTT=41 ms Type=0 Code=0 Identifier=20700 Sequence Number=25 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=26 RTT=20 ms Type=0 Code=0 Identifier=20700 Sequence Number=26 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=27 RTT=20 ms Type=0 Code=0 Identifier=20700 Sequence Number=27 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=28 RTT=21 ms Type=0 Code=0 Identifier=20700 Sequence Number=28 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=29 RTT=31 ms Type=0 Code=0 Identifier=20700 Sequence Number=29 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=30 RTT=16 ms Type=0 Code=0 Identifier=20700 Sequence Number=30 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
TTL=31 RTT=16 ms Type=0 Code=0 Identifier=20700 Sequence Number=31 104.111.46.91 Valid=True
Pinging (www.amazon.it) 104.111.46.91
```

The bottom status bar indicates the environment is Python 3.9.2 64-bit, with 0 errors and 3 warnings, and a Live Share button.

www.br.yahoo.com



The screenshot shows a Visual Studio Code editor window with a Python file named `traceroute.py` open. The file path is `C:\Users\Yesac> OneDrive - Oregon State University > CS 372 - Intro to Computer Networks > Module 4 > Project - Traceroute > traceroute.py`. The script contains a function `icmpHelperPing.traceRoute` that is called with the URL `"www.br.yahoo.com"` on line 646. The terminal output shows the execution of the script, which performs a series of ping tests to `www.br.yahoo.com` (IP: 74.6.136.150) with increasing TTL values from 1 to 21. The output includes RTT, Type, and Code for each hop. For TTLs 1 through 14, the results are summarized in a table. For TTLs 15 through 21, the output shows the Identifier, Sequence Number, IP, and Validity of each packet.

```
641
642
643     # icmpHelperPing.traceRoute("209.233.126.254")
644     # icmpHelperPing.traceRoute("www.oregonstate.edu")
645     # icmpHelperPing.traceRoute("www.amazon.it")
646     icmpHelperPing.traceRoute("www.br.yahoo.com")
647
648
```

Windows PowerShell
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\Users\Yesac> & C:/Users/Yesac/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Yesac/OneDrive - Oregon State University/CS 372 - Intro to Computer Networks/Module 4/Project - Traceroute/traceroute.py"

Pinging (www.br.yahoo.com) 74.6.136.150
TTL=1 RTT=4 ms Type=11 Code=0 10.0.0.1
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=2 RTT=13 ms Type=11 Code=0 96.120.36.73
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=3 RTT=12 ms Type=11 Code=0 96.110.15.121
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=4 RTT=13 ms Type=11 Code=0 96.110.4.34
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=5 RTT=14 ms Type=11 Code=0 96.110.4.117
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=6 RTT=24 ms Type=11 Code=0 96.110.5.142
Pinging (www.br.yahoo.com) 74.6.136.150
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.br.yahoo.com) 74.6.136.150
* * * * * Request timed out.
* * * * * Request timed out (By Exception).
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=9 RTT=62 ms Type=11 Code=0 4.14.4.250
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=10 RTT=65 ms Type=11 Code=0 209.191.64.183
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=11 RTT=74 ms Type=11 Code=0 74.6.227.139
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=12 RTT=57 ms Type=11 Code=0 74.6.122.45
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=13 RTT=56 ms Type=11 Code=0 74.6.123.238
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=14 RTT=57 ms Type=11 Code=0 74.6.98.136
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=15 RTT=58 ms Type=0 Code=0 Identifier=21620 Sequence Number=15 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=16 RTT=58 ms Type=0 Code=0 Identifier=21620 Sequence Number=16 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=17 RTT=59 ms Type=0 Code=0 Identifier=21620 Sequence Number=17 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=18 RTT=57 ms Type=0 Code=0 Identifier=21620 Sequence Number=18 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=19 RTT=57 ms Type=0 Code=0 Identifier=21620 Sequence Number=19 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=20 RTT=57 ms Type=0 Code=0 Identifier=21620 Sequence Number=20 74.6.136.150 Valid=True
Pinging (www.br.yahoo.com) 74.6.136.150
TTL=21 RTT=58 ms Type=0 Code=0 Identifier=21620 Sequence Number=21 74.6.136.150 Valid=True

Python 3.9.2 64-bit @ 3 Live Share