For all the programming assignments, you can choose any operating systems to develop your code. A README.txt is required in the submission of all programming assignments. In the README.txt, you need to provide the following information:

* How to compile your program?
* How to run your program?
* What are the output and the results when I run your program?
* Any descriptions which can help me understand, compile, run, and verify your answers.

Zip all of your source code, project files, supporting files, and README.txt and submit the all-in-one zip file together in Canvas.

**Part 1:** (10 points each). Run the ICMP\_Simple\_Ping.py program provided to you here. Make sure to run it as Administrator in Windows and sudo in Mac or Linux systems.

1. Explain what is the result when you run the above Python code.
2. Try to figure out what each step does in this code and explain it here.

**Part 2:** (50 points). Complete the Python script ICMP Pinger skeleton code here. This will give you an excuse to read section 5.6 in the text. ICMP is a pretty simple protocol and this project lets you build network-level packets out and receive them back.

* (10/50 points) You need to add a comment to each section that is not already commented on in the code, so I know you did your research to understand what this program does.

**Part 3:** (20 points) Observe the ICMP traffic from your program using Wireshark. Answer the following questions:

1. Examine one of the ICMP request packets sent by your Program. What are the ICMP type and code numbers? Does this match with the packet you created in the program? Explain your answer.
2. Examine the corresponding ICMP reply**.** What are the ICMP type and code numbers? Is there any warning? Ifyes**,** explain what is going on**.**

Examine the ICMP packet data in your packet capture. Is this different from the dummy ICMP data we created on the Python program? Explain your answer.