CS3205: Assignment 1
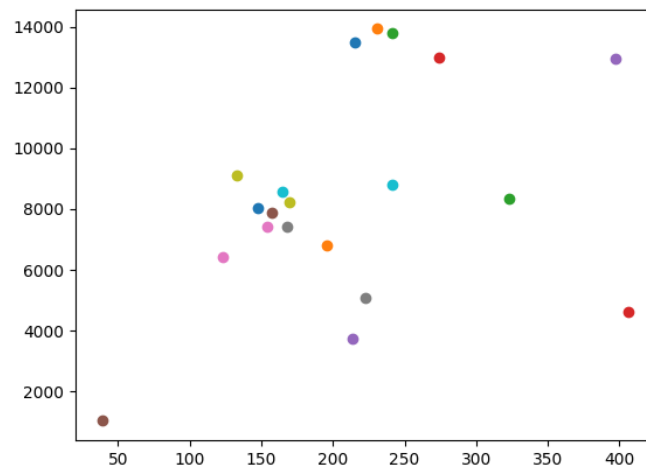
1. **Ping**

    a. Run 1a.py with `python 1a.py` to get output indistance.txt

    b. Run 2a.py with `sudo python 2a.py` to get output in distance.txt

    c. Run 2c.py with `sudo python 2a.py` to get plot in plot.png.

    It was observed that If these packets travelled at the "speed of light" they are approx 10x faster than the recorded RTT values.

    d. For ip 139.130.4.5

        i. Number of hops observed - 23

        ii. 115.247.85.129 - IP address of the router that forwards the packet to a foreign router

        iii. Singapore

2. **tcpdump**

    a. Number of packets exchanged - 8

Ping 139.130.4.5 :

```
PING 139.130.4.5 (139.130.4.5) 56(84) bytes of data.
64 bytes from 139.130.4.5: icmp_seq=1 ttl=228 time=257 ms
64 bytes from 139.130.4.5: icmp_seq=2 ttl=228 time=245 ms
64 bytes from 139.130.4.5: icmp_seq=3 ttl=228 time=243 ms
64 bytes from 139.130.4.5: icmp_seq=4 ttl=228 time=243 ms

--- 139.130.4.5 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 242.613/246.774/256.743/5.799 ms
```
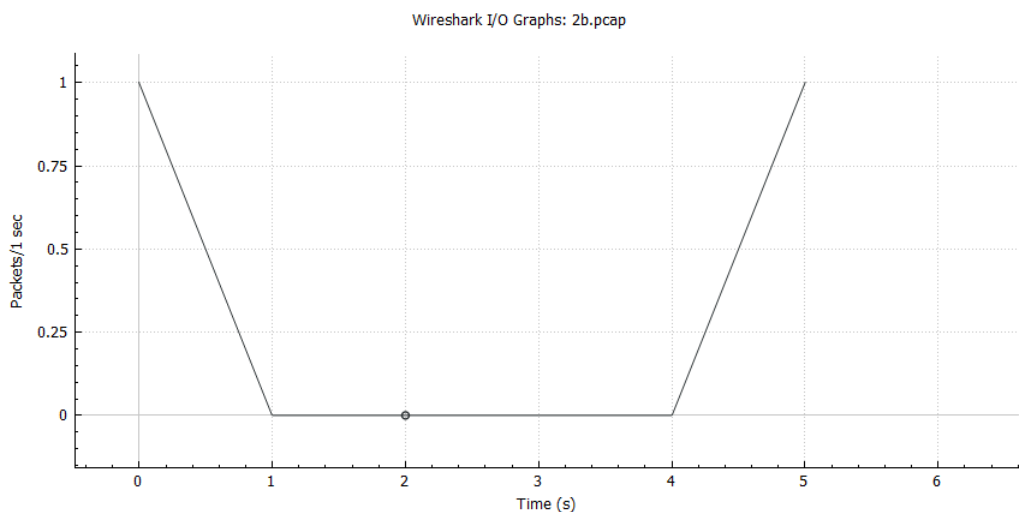
Timestamp from the pcap file 2a.pcap for the 8 packets:

```
2 4.040162   172.18.158.222   139.130.4.5 ICMP
3 4.296889   139.130.4.5 172.18.158.222   ICMP
4 5.041943   172.18.158.222   139.130.4.5 ICMP
5 5.286501   139.130.4.5 172.18.158.222   ICMP
6 6.043620   172.18.158.222   139.130.4.5 ICMP
7 6.286748   139.130.4.5 172.18.158.222   ICMP
8 7.045025   172.18.158.222   139.130.4.5 ICMP
9 7.287622   139.130.4.5 172.18.158.222   ICMP
```

We can verify that the time elapsed between an individual ping request and response agree with the reported RTT value.

b. pcap file - 2b.pacp

    i. 1,0,0,0,1 packets are exchanged in 1st second, 2nd second,... 5th second respectively.

    ii. Out of the two packets one is outgoing and one is incoming.

iii. Size of incoming packet = 211 bytes and size of outgoing packet = 86

　c. pcap file - 2c.pacp

3. **Hamming Code**

　　Run 3.py with `python 3.py` to get output in stdout as :

```
Text: it was a bright cold day in february, and the clocks were striking thirteen.
Code Word: 044B5281EE2E8BCC8942220109C9D2463BA1D0D0061BBDB1486A839085726203A5B8E04
4B31D89E44F2B05C9760A6101855E2F2181D1504EA981ADD80EFF0DAD660A03D995E44E2901DDE82F1
325AFD206D39C81E83EC3A5C9E8662B97B85C
Bit flip idx: [22, 28, 14, 35, 1, 23, 34, 20, 37, 38, 7, 26, 13, 21, 27, 30, 10, 3, 22]
Num Blocks: 19
```