

Q8

Source and Destination inside a Continent

```
taowang@Taos-MacBook-Air ~ % traceroute youtube.com
traceroute to youtube.com (142.251.214.142), 64 hops max, 52 byte packets
 1  10.12.159.1 (10.12.159.1)  11.839 ms  10.408 ms  9.406 ms
 2  12.138.185.185 (12.138.185.185)  7.792 ms  10.868 ms  13.583 ms
 3  32.132.237.13 (32.132.237.13)  7.735 ms  6.872 ms  5.529 ms
 4  12.123.155.82 (12.123.155.82)  19.889 ms  17.321 ms  11.831 ms
 5  * * *
 6  * * *
 7  * * *
 8  32.130.105.99 (32.130.105.99)  16.298 ms  11.139 ms  15.026 ms
 9  12.255.10.228 (12.255.10.228)  15.444 ms  13.654 ms  23.930 ms
10  * * *
11  142.251.70.106 (142.251.70.106)  15.111 ms
    209.85.252.250 (209.85.252.250)  26.616 ms
    142.251.241.105 (142.251.241.105)  16.199 ms
12  192.178.46.198 (192.178.46.198)  14.245 ms
    142.251.241.105 (142.251.241.105)  11.915 ms
    192.178.46.196 (192.178.46.196)  10.094 ms
13  sfo03s32-in-f14.1e100.net (142.251.214.142)  11.015 ms  10.456 ms  11.930 ms
```

Mean = $\frac{11.015 + 10.456 + 11.930}{3} = 11.13 \text{ ms}$

Standard Deviation = $\sqrt{\frac{((11.015-11.13)^2 + (10.456-11.13)^2 + (11.930-11.13)^2)}{3}} = 0.608 \text{ ms}$

Number of Intervening Routers = 12

Different Domain:

- sfo03s32-in-f14.1e100.net

Source and Destination on Different Continents

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taowang@Taos-MacBook-Air ~ % traceroute gamer.com.tw
traceroute: Warning: gamer.com.tw has multiple addresses; using 104.16.182.30
traceroute to gamer.com.tw (104.16.182.30), 64 hops max, 52 byte packets
 1  10.12.159.1 (10.12.159.1)  27.572 ms  22.331 ms  13.965 ms
 2  12.138.185.185 (12.138.185.185)  16.080 ms  15.898 ms  17.901 ms
 3  32.132.237.13 (32.132.237.13)  27.916 ms  16.519 ms  22.594 ms
 4  12.123.155.82 (12.123.155.82)  29.257 ms  33.504 ms
    12.123.155.86 (12.123.155.86)  23.999 ms
 5  sffca22crs.ip.att.net (12.122.18.14)  31.368 ms  31.493 ms  17.837 ms
 6  sffca402igs.ip.att.net (12.122.114.29)  26.014 ms
    12.122.149.137 (12.122.149.137)  20.035 ms
    sffca402igs.ip.att.net (12.122.114.29)  68.762 ms
 7  192.205.37.58 (192.205.37.58)  31.308 ms  24.391 ms  17.893 ms
 8  ae-9.r24.snjsca04.us.bb.gin.ntt.net (129.250.2.2)  46.775 ms
    ae-9.r25.snjsca04.us.bb.gin.ntt.net (129.250.3.102)  33.112 ms  25.093 ms
 9  ae-0.a03.snjsca04.us.bb.gin.ntt.net (129.250.2.159)  59.827 ms *
    ae-1.a03.snjsca04.us.bb.gin.ntt.net (129.250.2.191)  47.470 ms
10  * * *
11  172.69.132.2 (172.69.132.2)  90.396 ms
    172.71.156.2 (172.71.156.2)  16.629 ms
    162.158.164.2 (162.158.164.2)  43.563 ms
12  104.16.182.30 (104.16.182.30)  26.363 ms  25.222 ms  16.676 ms

```

Mean = $\frac{26.363 + 25.222 + 16.676}{3} = 22.75 \text{ ms}$

Standard Deviation =

$\sqrt{\frac{(26.363 - 22.75)^2 + (25.222 - 22.75)^2 + (16.676 - 22.75)^2}{3}} = 4.323 \text{ ms}$

Number of Intervening Routers = 11

Different Domain:

- sffca22crs.ip.att.net
- sffca402igs.ip.att.net
- sffca402igs.ip.att.net
- ae-9.r24.snjsca04.us.bb.gin.ntt.net
- ae-9.r25.snjsca04.us.bb.gin.ntt.net
- ae-0.a03.snjsca04.us.bb.gin.ntt.net
- ae-1.a03.snjsca04.us.bb.gin.ntt.net