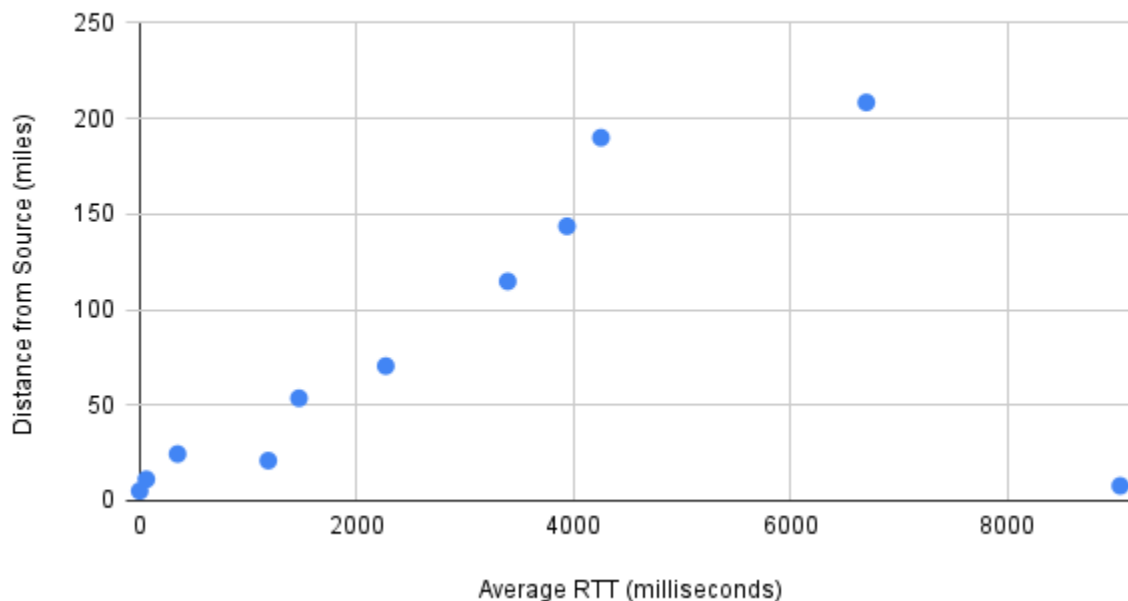- Using the pinger data, draw or create a scatterplot with the Average RTT in milliseconds on the Y-axis, and the geographic distance in miles on the X-axis. Save this scatterplot to be uploaded as one of your deliverables.
- Using the scatterplot you generated, answer the following questions:

Average RTT vs Distance

1. **Are RTT and geographic distance correlated positively, negatively, or not at all? If applicable, also comment on the strength of correlation (weak vs. strong).**

   RTT and geographical distance are strongly positively correlated. The further away the destination is, the more time it takes for a round trip to be completed.

2. **Why do you think you observe this trend (or lack thereof)?**

   I think this trend is observed because the further away the destination, the more the packet has to travel along multiple hops on a longer route.

- Using the traceroute data, draw or create a scatterplot with the # Hops to Target on the Y-axis, and the geographic distance in miles on the X-axis. Save this scatterplot to be uploaded as one of your deliverables.
- Using the scatterplot you generated, answer the following questions:

Hops vs Distance
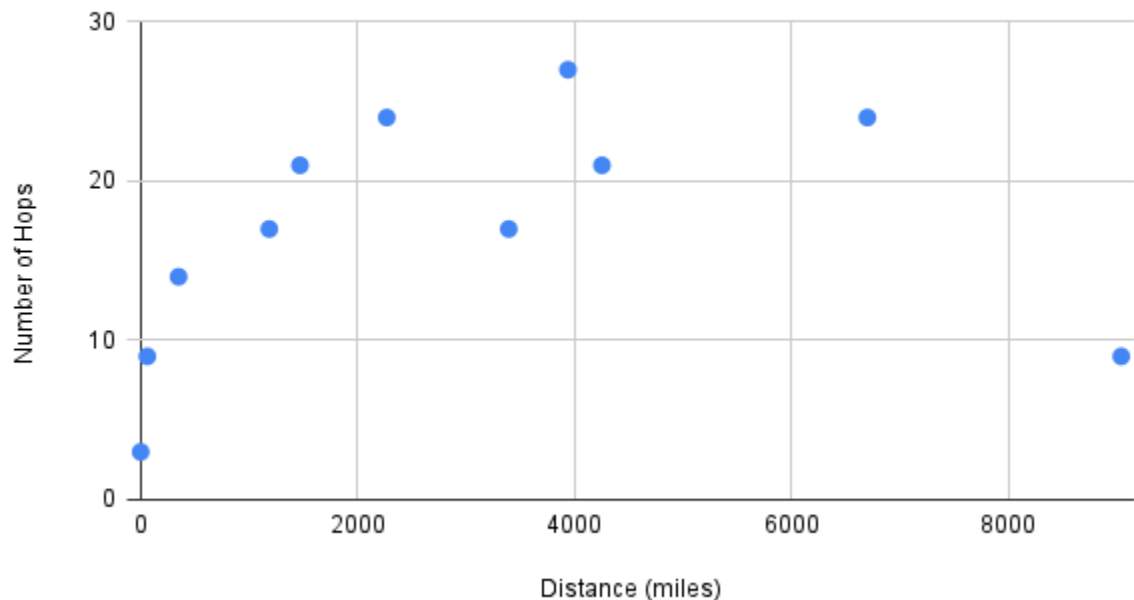
1. **Are # hops and geographic distance correlated positively, negatively, or not at all? If applicable, also comment on the strength of correlation (weak vs. strong).**

   The number of hops is weakly positively correlated to the distance away from the source. To a certain extent, it takes more hops to reach a further destination. However, it is important to note that there are a few outliers to this rule, making the correlation weak.

2. **Why do you think you observe this trend (or lack thereof)?**

   I think this correlation is positive but weak because routers aim to find the fastest and most efficient way to get to a place and for further destinations, this can be done by hopping over fewer routers that cover more distance. A path with fewer hops but

greater physical distance may be chosen over a shorter path with more hops to optimize network performance.

Today's advanced technology can also allow data to be transmitted over long distances with fewer hops, using tools like underwater fiber optic cables to connect continents.