Problem 2.7

- Suppose within your Web browser you click on a link to obtain a Web page.
- The IP address for the associated URL is not cached in your local host, so a DNS lookup is necessary to obtain the IP address.
- Suppose that \( n \) DNS servers are visited before your host receives the IP address from DNS.
  - The successive visits incur an RTT of \( RTT_1, \ldots, RTT_n \).
- Further suppose that the Web page associated with the link contains exactly one object, consisting of a small amount of HTML text.
  - Let \( RTT_0 \) denote the RTT between the local host and the server containing the object.
- Assuming zero transmission time of the object, how much time elapses from when the client clicks on the link until the client receives the object?
Problem 2.8

- Referring to Problem 2.7, suppose the HTML file references eight very small objects on the same server.

- Neglecting transmission times, how much time elapses with
  a. Non-persistent HTTP with no parallel TCP connections?
  b. Non-persistent HTT

Problem 2.25

- Consider an overlay network with N active peers, with each pair of peers having an active TCP connection.

- Additionally, suppose that the TCP connections pass through a total of M routers.

- How many nodes and edges are there in the corresponding overlay network?
Problem 2.28 – We’ll do this after the lab

- Assume that you have installed and compiled the Python programs TCPClient and UDPClient on one host and TCPServer and UDPServer on another host.

  a. Suppose you run TCPClient before you run TCPServer. What happens? Why?
  b. Suppose you run UDPClient before you run UDPServer. What happens? Why?
  c. What happens if you use different port numbers for the client and server sides?