COMPTER NETWORKS
HOMEWORK 2: CHAPTER 2

(2012-10-22)

Submission Deadline: 23:59PM, 2012-11-4

Notes: All exercises are in accordance with the 5th edition (*International Edition*).

Exercise 1 (R4)
For a P2P file-sharing application, do you agree with the statement, "There is no notion of client andserver sides of a communication session"? Why or why not?

Exercise 2 (R24)
What is an overlay network? Does it include routers? What are the edges in the overlay network? How is the query-flooding overlay network created and maintained?

Exercise 3 (P8)
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, ..., 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?

Exercise 4 (P23)
Consider query flooding, as discussed in Section 2.6. Suppose that each peer is connected to at most *N* neighbors in the overlay network. Also suppose that the node-count field is initially set to *K*. Suppose Alice makes a query. Find an upper bound on the number of query messages that are sent into the overlay network.

Exercise 5 (P22)
Suppose that in UDPClient.java we replace the line

```
DatagramSocket clientSocket = new DatagramSocket();
```

With

```
DatagramSocket clientSocket = new DatagramSocket(5432);
```

Will it become necessary to change UDPSever.java? What are the port numbers for the socket in UDPClient and UDPServer? What were they before making this change?