CptS 455 Homework 2
Due Monday, Sept 14, 2015, 11:59:59PM
Turn in using the Project turn-in link on the Course Home Pate www.eecs.wsu.edu/~hauser/cs455. Answers should be typed. Convert your answer file to PDF and turn in a file named two.pdf. Copy the text of each question or problem into your answer document preceding your answer to that problem.

These questions pertain to Chapter 2.

1. The kliks URL for this class is http://kliks.eecs.wsu.edu:7070. In networking terms, what is the "7070" here? (Section 2.1.2)
2. I'm also teaching CptS 355 and using kliks for that class as well, but the URL for that class is http://kliks.eecs.wsu.edu:8080. Why do you suppose I use different URLs for the two classes?
3. Explain succinctly the difference between a *port* and a *socket.*
4. What is the importance of *well-known ports* such as port 80 for web, port 25 for smtp, and port 22 for secure shell? Can these services be run on other ports? What reasons might one have for doing that? What issues have to be dealt with when services are run on non-standard ports?
5. Figure 2.4 says that downloading web documents requires a few kbps. Do you think that a few kbps of download speed gives a satisfactory user experience? What might have changed since Figure 2.4 was created?
6. The reliable data transfer guarantee provided by TCP is actually a bit stronger than stated in section 2.1.4: an application reading from a TCP socket is assured of receiving the same stream of bytes sent by the sender with no loss or duplication *and in the same order that the bytes were sent.* This additional guarantee is a source of problems for some time-sensitive applications. Why? (Hint: consider the effect of lost data (at a layer below the transport layer) on what the transport layer must do in order to meet its guarantees).
7. Another characteristic of TCP is that its service model is reliable delivery of a stream of *bytes.* In particular it does not preserve segment boundaries from the sender to the receiver. That is, the sender may send a segment of 1000 bytes followed by a segment of 500 bytes. The receiver may receive a single segment of 1500 bytes, or 3 segments of 500 bytes, or even 1500 segments of 1 byte each! What implications does this behavior have for application protocols? As a hint, refer to figure 2.8 and consider why the blank line is required between the header lines and the request body and could not be replaced by sending the headers and body separately.
8. A similar issue to that of problem 7 governs the issue of "where does the entity body end" in an HTTP request or response. Why doesn't a blank line suffice to terminate the entity body? What mechanism is used instead to allow the receiver of a request (or response) to determine the end of the entity body part of the request (or response). (I do not believe the answer to this can be found in the book – you will have to do a little research. Cite your sources.)
9. Section 2.3 concerns FTP, the file transfer protocol. Why is FTP infrequently used today? (Again, some research is warranted)
10. SMTP, POP3, and IMAP are all protocols related to email. Of the three of them, which is essential to providing email connectivity between essentially all Internet users? Why? Why could we get by without the other two?
11. The DNS service described in the book is not secure as described on p. 143. Explain in your own words in a couple of paragraphs how the DNSSEC specifications go about reducing DNS-related vulnerabilities. Cite any sources you use and DO NOT COPY directly from the sources.