Internet and Web Technologies (CSCI 355)
Summer 2018

Midterm Exam

Problem 1 (15 points)

[a] What do TCP and IP respectively stand for?
[b] State the layers in the TCP/IP model. (No further explanation required for this question.)
[c] What does OSI stand for?
[d] State the layers in the OSI model, and briefly discuss (where appropriate, touching on some supporting protocols) the contribution of each layer to the overall functioning of the internet.

Problem 2 (20 points)

[a] Define datagram and list some of its components.
[b] What are some of the issues that can occur in the transmission of datagrams over an internet.
[c] Identify and discuss several features of a transmission protocol that uses a “best-effort delivery” approach.
[d] Identify and discuss several features of a transmission protocol that uses a “reliable service” approach.
[e] What is “encapsulation” and how does it relate to the rest of this question?

Problem 3 (20 points)

[a] Describe the IPv4 addressing scheme.
[b[Describe a few ways in which IPv6 differs from IPv4.
[c] Discuss the at least three “partners” in the determining the IP addresses used in IPv4.
[d] What is “classful” addressing, and what are the classes used in IPv4.
[e] What is “classless” addressing in IPv4, and what additional data is needed to use it.
[f] Suppose a company with 75 employees was originally allocated addresses of the form 192.123.156.xxx, but now is dividing into three smaller separate companies of 25 employees each, with each company having its own network and routers. How might this situation be respectively handled in the classful and classless addressing schemes?

Problem 4 (15 points)

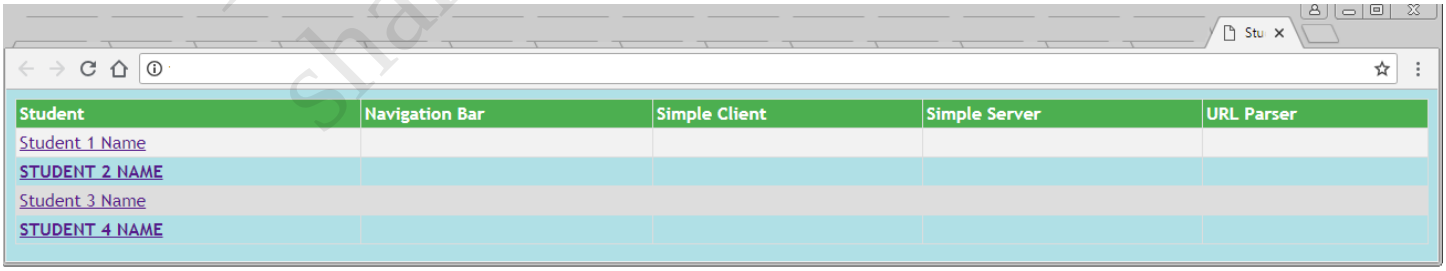
[a] List at least five differences between the “stream” and “message” paradigms.
[b] Discuss some of the main features of the client-server architecture, and the respective roles of client and server.
[c] What is a peer-to-peer architecture and in what ways does it differ from the client-server model.

Problem 5 (15 points)

[a] Discuss the function and features of the HTTP protocol.
[b] Name and state the purpose of at least four “request types” of HTTP.
[c] What is HTTPS, and state a few ways in which it differs from HTTP.

Problem 6 (20 points)

An instructor wishes to maintain a page titled “Student Dashboard” which is a table of students in a class for the purposes of tracking their assignments. Clicking on each student’s name will bring up the homepage of their website in a separate tab (browser page). Moreover the instructor would like to *visually indicate* – beyond mere text - which students have completed their assignments. Thus for example, if a student has a “Y” for a particular assignment it might show in green and bold, while if the student has a “N”, it would show in red. (Since the instructor may change his mind about how that visual indication should occur – and may even task an assistant, better versed in design, with controlling that styling – it should be easily and separately maintained.) Show the HTML and CSS that might be used for such a task.



Problem 7 (5 points)

[a] What does URL stand for?
[b] What are the components of a URL?