50.005 NS Quiz 4 (mock quiz; suggested time: 15 mins)
Name: _**Suggested Solutions**_____ Student ID: _____

Note: This is a mock quiz that won't be graded, and you don't have to submit it formally. It is suggested, however, that you attempt it like a real quiz.

1. If a Web server is to support N simultaneous HTTP connections, each from a different client browser, how many sockets will the Web server need to open during its whole execution?

N + 1. [One welcome socket for accepting connections, then one socket for the established connection with each client.]

2. Suppose a Web browser visits an HTML page with four embedded JPEG objects. At least how many RTTs are needed for the full page to load assuming (i) non-persistent HTTP with the browser configured for three parallel connections, and (ii) persistent HTTP (over a TCP connection) without any pipelining. You can assume that all the HTML and JPEG objects are small so that you can ignore their transmission time. You can also ignore TCP close.

(i) 6 RTTs (2 RTTs for the base page, then 2 RTTs for 3 JPEG objects in parallel, then 2 RTTs for the 4th JPEG object). (ii) 6 RTTs (2RTTs for the base page, then 1 RTT for each JPEG object).

3. A Web client that has cached an object can use the HTTP ___**conditional get**_____ request to check with the Web server that the cached copy is still up-to-date.

4. True or false: In HTTP/1.1 (persistent HTTP), multiple HTTP GET requests sent in a pipelined fashion over a TCP connection must complete in the same order in which they were sent.

True. [A TCP connection will not reorder data in either direction (i.e., requests from the client to the server, or replies from the server to the client), and the HTTP/1.1 server will process the GET requests one by one, in the order they were received.]