CECS 327 Assignment 2 - Architectures

20 points

Assignment Description. Answer the following questions from the Chapter 2 reading from your textbook. Be through and complete with your answers. You *may* work on these questions with a partner (no more than two working together), but **both** students must submit the document individually on Beachboard Dropbox along with both students' names on each submission.

1. What is a three-tiered client-server architecture?
2. What is the difference between a vertical distribution and a horizontal distribution?
3. If a client and a server are placed far apart, we may see network latency dominating overall performance. How can we tackle this problem?
4. Consider a chain of processes P_1, P_2, ..., P_n implementing a multitiered client-server architecture. Process P_i is client of process $P_i + 1$, and P_i will return a reply to $P_i - 1$ only after receiving a reply from P_i+1. What are the main problems with this organization when taking a look at the request-reply performance at process P_1?
5. In a structured overlay network, messages are routed according to the topology of the overlay. What is an important disadvantage of this approach?
6. Consider an unstructured overlay network in which each node randomly chooses c neighbors. If P and Q are both neighbors of R, what is the probability that they are also neighbors of each other?
7. Not every node in a peer-to-peer network should become superpeer. What are reasonable requirements that a superpeer should meet?
8. Give an example of a self-managing system in which the analysis component is completely distributed or even hidden.
9. Consider a BitTorrent system in which each node has an outgoing link with a bandwidth capacity B_{out} and an incoming link with bandwidth capacity B_{in}. Some of these nodes (called seeds) voluntarily offer files to be downloaded by others. What is the maximum download capacity of a BitTorrent client if we assume that it can contact at most one seed at a time?
10. Modern cars are stuffed with electronic devices. Give some examples of feedback control systems in cars.

Deliverables. Submit the answers to the questions on **Beachboard Dropbox** by the indicated due date and time. Acceptable file submission formats are: .txt, .rtf, .odt, .doc, .docx, or .pdf.