

## Study Questions – Networking, Programming Concepts

No need to turn these in, these are just some questions for your reference to help you study for the second exam. Sorry, no solutions are available, but if you have specific questions feel free to show me your answer or to post on the web bulletin board.

1. What was ARPANet?
2. What is the difference between bps (bits per second) and baud?
3. What physical medium would be most appropriate for creating a network spanning:
  - a. A very short distance, e.g. connecting computers in a room
  - b. A somewhat short distance, e.g. between buildings
  - c. A long distance, e.g. between cities or countries
4. What is the role of multiplexing in creating a network?
5. What is the difference between a hub, switch, bridge, and router?
6. Illustrate how token ring operates when a computer wants to send
  - a. What happens if multiple computers want to send data simultaneously?
7. Illustrate how Ethernet operates when a computer wants to send
  - a. What happens if multiple computers want to send data simultaneously?
8. What is the network “stack” in the context of TCP/IP?
9. What is a packet and what are typical fields of a packet?
10. In terms of TCP/IP, computer A wants to send a large amount of data to computer B. What transformation of this data occurs to send the information to B across a network such as the Internet? Describe what happens at each layer.
11. What is the relationship between a computer’s domain name and IP address?
12. What does the traceroute program do?
13. For a programming language, what is the difference between syntax and semantics?
14. What is the difference between an assembler and a compiler?
15. What is the difference, pro’s, and con’s of an interpreted programming language vs. a compiled programming language?
16. List the steps that are required to manage the development of a computer program from scratch.
17. Describe in detail an algorithm to compute:
$$\sum_{i=0}^{i=n} n^2$$
18. Describe in detail an algorithm to compute  $n!$ , i.e.:
$$\prod_{i=1}^{i=n} i$$
19. In the networking section, we said that a **checksum** is typically added to a packet of data. This checksum is a short number that the recipient can use to check and see if the packet of data arrived intact, or if there was an error and some bits in the packet were flipped. In other words, this is very similar to the parity bit checking we discussed previously, but it works on an entire packet of data. Describe an algorithm that can compute a checksum for a block of data.