

COSE222 Computer Architecture Assignment #2

No late turn-in accepted

In the Patterson & Hennessy book (Computer Organization and Design 4th Edition),

1. Exercise 1.2.1
2. Exercise 1.2.2
3. Exercise 1.2.3
4. Exercise 1.3.1
5. Exercise 1.3.2
6. Exercise 1.3.3
7. Exercise 1.3.4
8. Exercise 1.3.5
9. Exercise 1.3.6
10. Exercise 1.4.1
11. Exercise 1.4.2
12. Exercise 1.4.3

Please read the following excerpt from a book “**Computer Network**” by Tanenbaum, to clarify the meaning of KB, MB, GB, Kbps, Mbps, Gbps in exercise questions.

It is also worth pointing out that for measuring memory, disk, file, and database sizes, in common industry practice, the units have slightly different meanings. There, kilo means 2^{10} (1024) rather than 10^3 (1000) because memories are always a power of two. Thus, a 1-KB memory contains 1024 bytes, not 1000 bytes. Note also the capital “B” in that usage to mean “bytes” (units of eight

SEC. 1.7

METRIC UNITS

83

bits), instead of a lowercase “b” that means “bits.” Similarly, a 1-MB memory contains 2^{20} (1,048,576) bytes, a 1-GB memory contains 2^{30} (1,073,741,824) bytes, and a 1-TB database contains 2^{40} (1,099,511,627,776) bytes. However, a 1-kbps communication line transmits 1000 bits per second and a 10-Mbps LAN runs at 10,000,000 bits/sec because these speeds are not powers of two. Unfortunately, many people tend to mix up these two systems, especially for disk sizes. To avoid ambiguity, in this book, we will use the symbols KB, MB, GB, and TB for 2^{10} , 2^{20} , 2^{30} , and 2^{40} bytes, respectively, and the symbols kbps, Mbps, Gbps, and Tbps for 10^3 , 10^6 , 10^9 , and 10^{12} bits/sec, respectively.

Examples:

- 2GHz clock frequency = 2×10^9 Hz
- 1MB memory = 1×2^{20} Bytes
- 500GB HDD = 500×2^{30} Bytes
- 1Gbps = 1×10^9 bits per second

What and How to submit:

1. Upload pdf to Blackboard **before** the class begins
2. Submit the printed copy of the pdf in class to TA **before** the class begins.

Note: This is an individual assignment. You are welcome to discuss, but DO NOT COPY solutions. If you are found to copy solutions from others or slightly modify the solutions from others, both of you will be given 0 credits.