Tutorials #2

Exercise 01:

1. What function does the motherboard serve?
2. Identify the examined buses and elaborate on the purpose of each.

Exercise 02:

We possess three motherboards with the following specifications:

- First motherboard: 8-bit bus width and a Front Side Bus (FSB) frequency of 165 KHz.
- Second motherboard: 16-bit bus width and an FSB frequency of 275 MHz.
- Third motherboard: 32-bit bus width and an FSB frequency of 1.8 GHz.

Perform the following calculations:

1. Determine the bandwidth of each motherboard in megabytes.
2. Calculate the maximum amount of memory address that can be supported by each motherboard.
3. Find out the time required to fill memory capacities of 16KB, 2GB, and 6GB for each motherboard, knowing that the size of a memory word is equal to 32bits

Exercise 03

We aim to work with 3D graphics using an image processing application. Installing this program necessitates a hard drive with a capacity exceeding 48 GB. The program is being installed on a computer with a maximum memory limit of 4 GB, aligned to the byte. To ensure smooth operation, the program needs to load 5 GB of its content every three seconds.

1. What is the smallest memory capacity needed to avoid program slowdown?
2. What is the simplest motherboard configuration that ensures smooth program operation?
3. How long does it take for the program to finish loading?

Exercise 04

We want to transfer 20 files, each of the same size, which is 150 MB, from ATA100 hard drive to another ATA133 hard drive on a computer with a 32-bit motherboard.

- What is the time required to complete this operation?

Exercise 05

We possess a computer equipped with a 2.8 GHz processor. This computer features a motherboard with a 1600 MHz Front-Side Bus (FSB) aligned to the byte, along with a hard drive connected to a PCI-E 16X port. Additionally, it includes two USB 3.0 ports and a DVD reader connected to an ATA133 port. The computer is designed with 4 RAM slots, each supporting a maximum capacity of 4GB.

1. What is the highest RAM size allowable for installation on this computer?
2. What is the minimal acceptable System Bus width?
3. What is the computer's bandwidth?

Our objective is to play a movie on the DVD player and transfer a folder from the computer to a Flash Disk.

4. What is the time needed for transferring the folder, containing 10 files of 50 MB each?
5. What bandwidth is utilized for playing the film?"