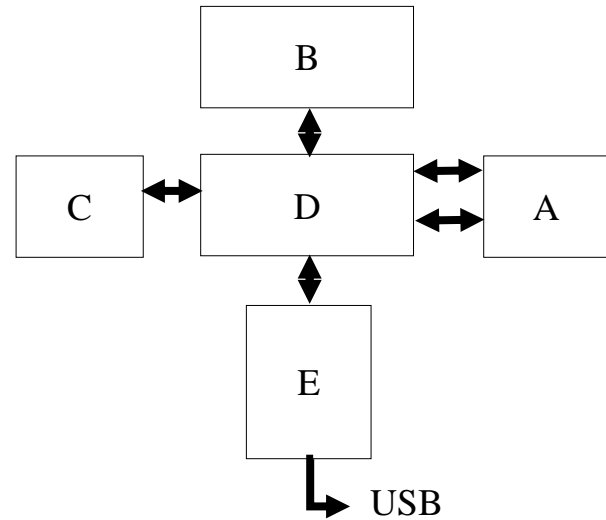# Tutorials #3

Exercise 01:

- Provide the meaning of each component in the following diagram of an Intel chipset.
- Cite the characteristics of a processor.

Exercise 02:

The Computing Lab in the Engineering Department is equipped with high-performance computers to support intensive software applications. Each computer is powered by a 3.4 GHz Intel Core i7 processor. The processor is mounted on a Gigabyte motherboard with a Front Side Bus (FSB) speed of 1600 MHz. The motherboard includes four (04) memory slots, each operating at a speed of 1333 MHz and supporting a maximum of 8GB per slot.

- What is the total maximum RAM capacity that each computer can accommodate?
- Determine the width of the system bus.
- Determine the frequency used by the computer.
- Calculate the computer's bandwidth.
- Estimate the latency experienced by each electronic component.

Exercise 03:

A first-year computer science student wants to buy a powerful laptop for practical assignments. The salesperson offers him three laptops:

Laptop 1: 64-bit Intel i5 quad-core processor with a frequency of 1.8 GHz, installed on an Acer motherboard with a Front Side Bus (FSB) speed of 1833 MHz, and DDR4 RAM supporting up to 2333 MHz.

Laptop 2: 64-bit Intel i7 dual-core processor with a frequency of 2.8 GHz, installed on a Gigabyte motherboard with an FSB speed of 1687 MHz, and DDR3 RAM supporting up to 1833 MHz.

Laptop 3: 64-bit Intel i5 dual-core processor with a frequency of 1.4 GHz, installed on an Asus motherboard with an FSB speed of 2433 MHz, and DDR3 RAM supporting up to 2133 MHz.

Which laptop is the best choice for this student? Justify your answer.

Exercise 04:

In a Von Neumann machine:

1. Data is stored in the..............................
2. Programs are stored in the..............................
3. How does the processor determine the location of the next instruction to execute?
4. How is an instruction written in the machine's memory?
5. Where are calculations performed?
6. What is the role of the sequencer in the machine?
7. What is the role of scheduling in the context of a Von Neumann machine?
8. Where is the instruction being executed in the machine's architecture?
9. Why are caches used in a Von Neumann architecture?

Exercise 05:

Complete the diagram of the Von Neumann machine