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Microcomputers - CIS 225

Assignment 1

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1. **Read about Harvard Architecture and von Neumann architecture. In your own words in 2 paragraphs (5 sentences each) compare and contrast the two types of architecture.**

The Harvard Architecture is a computer architecture that is organized in a way that all store location and pathway for instructions and data are separated. Because of how it is designed, the Harvard Architecture have some advantage and disadvantage as well. One its advantage is that it can read and write simultaneously. The main disadvantage that it has is that the control unit for two buses is more complicated which adds to the development cost. This type of computer architecture is mainly used in microcontrollers and signal processing.

The Von Neumann Architecture is another computer architecture based on the stored-program computer concept, this means that it shares the same bus for instruction fetch and data operation, so it can work with one of them at the time. Besides that, the advantage of this type of architecture is that it has a simpler control unit design, and the development of one is cheaper and faster. The Von Neuman Architecture is mainly used in personal computers, laptops, and workstations.

Web links:

1- <http://infocenter.arm.com/help/index.jsp?topic=/com.arm.doc.faqs/ka11516.html>

2- <https://en.wikipedia.org/wiki/Von_Neumann_architecture>

3- <https://en.wikipedia.org/wiki/Harvard_architecture>

1. **Read about RISC vs. CISC processors and in your own words in 2 paragraphs compare and contrast these types of processors.**

Reduced instructions set computers (RISC), is an instruction set architecture that has a software-centric design. This type of instruction set architecture is well-known for having a small number of fixed-length instructions and having fewer cycles per instructions than a CISC. A disadvantage of the RISC architecture is that it has a heavy use of the RAM (can cause a bottleneck if RAM is limited). RISC architecture is mainly used in portable devices due to its power efficiency.

Complex instruction set computer is another instruction set architecture that has a hardware-centric design. This instruction set architecture attempts to minimize the number of instructions per program, sacrificing the number of cycles per instruction. This means that it is slower than the RISC architecture because its instructions can take several clock cycles. One of the advantages of this type of set architecture is that it has more efficient use of RAM than the RISC.

Web links:

1- <https://www.edgefxkits.com/blog/what-is-risc-and-cisc-architecture/>

2- <https://cs.stanford.edu/people/eroberts/courses/soco/projects/risc/risccisc/>

3- <https://en.wikipedia.org/wiki/Complex_instruction_set_computer>

**INCLUDE THE WEB LINKS WHERE YOU FOUND THIS INFORMATION**