

2 Lecture - CS501

Important Subjective

1. What is Instruction Set Architecture (ISA)?

Answer: Instruction Set Architecture (ISA) is the interface between hardware and software in a computer system. It defines the set of instructions that a processor can execute and how those instructions are encoded, as well as the memory organization, registers, and I/O operations.

What is the role of an instruction set in a computer system?

Answer: The instruction set is responsible for defining the operations that can be performed by a processor and how those operations are encoded in machine code. It determines the compatibility and performance of a computer system.

What is the difference between a register-based and a stack-based instruction set architecture?

Answer: In a register-based ISA, the instructions operate on registers, while in a stack-based ISA, the instructions operate on a last-in, first-out (LIFO) stack.

What is instruction encoding in ISA?

Answer: Instruction encoding is the process of translating assembly code into machine code, which is a binary representation of the instruction set.

What are addressing modes in ISA?

Answer: Addressing modes are a way of specifying the operand of an instruction. The different addressing modes include immediate, direct, indirect, and indexed.

What is the role of registers in ISA?

Answer: Registers are used to store data and control information in a processor. They are faster to access than memory and are used to improve the performance of a processor.

What is the difference between CISC and RISC instruction set architectures?

Answer: CISC architectures have complex instructions that can perform multiple operations, while RISC architectures have simpler instructions that perform only one operation. RISC architectures also have a simpler instruction set and fewer addressing modes than CISC architectures.

What is orthogonality in ISA?

Answer: Orthogonality refers to the property of an ISA where the instructions are independent of each other, meaning that any instruction can be used with any addressing mode.

How does the choice of ISA affect the performance of a computer system?

Answer: The choice of ISA affects the performance of a computer system by determining the efficiency of the instruction set and the compatibility of the processor with software applications.

What are the key components of an ISA?

Answer: The key components of an ISA include instruction encoding, memory organization,

registers, addressing modes, and I/O operations.