I'm not robot

reCAPTCHA

I am not robot!

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Input output reference instructions in computer architecture

Introduction : Computer organization refers to the way in which the components of a computer system are organized and interconnected to perform specific tasks. One of the most fundamental aspects of computer organization is the set of basic computer instructions that the system can execute. debufi Basic computer instructions are the elementary operations that a computer system can perform.

These instructions are typically divided into three categories: data movement instructions, arithmetic and logic instructions, and control instructions. Data movement instructions are used to move data between different parts of the computer system. These instructions include load and store instructions, which move data between memory and the CPU, and input/output (I/O) instructions, which move data between the CPU and external devices. Arithmetic and logic instructions are used to perform mathematical operations and logical operations on data stored in the system.

These instructions include add, subtract, multiply, and divide instructions, as well as logic instructions such as AND, OR, and NOT.

Control instructions are used to control the flow of instructions within the computer system. These instructions include branch instructions, which transfer control to different parts of the program based on specified conditions, and jump instructions, which transfer control to a specified memory location. The basic computer has 16-bit instruction register (IR) which can denote either memory reference or register reference or input-output instruction.

Memory Reference – These instructions refer to memory address as an operand. The other operand is always accumulator. Specifies 12-bit address, 3-bit opcode (other than 111) and 1-bit addressing mode for direct and indirect addressing. Example – IR register contains = 0001XXXXXXXXXXXX, i.e. ADD after fetching and decoding of instruction we find out that it is a memory reference instruction for ADD operation. Hence, DR ← M[AR] AC ← AC + DR, SC ← 0 Register Reference – These instructions perform operations on registers rather than memory addresses. The IR(14 – 12) is 111 (differentiates it from memory reference) and IR(15) is 0 (differentiates it from input/output instructions). The rest 12 bits specify register operation. Example – IR register contains = 0111001000000000, i.e. CMA after fetch and decode cycle we find out that it is a register reference instruction for complement accumulator. Hence, AC ← ~AC Input/Output – These instructions are for communication between computer and outside environment. The IR(14 – 12) is 111 (differentiates it from memory reference) and IR(15) is 1 (differentiates it from register reference instructions). The rest 12 bits specify I/O operation. Example – IR register contains = 1111100000000000, i.e. INP after fetch and decode cycle we find out that it is an input/output instruction for inputing character. Hence, INPUT character from peripheral device. Essential PC directions are the principal tasks that a PC can perform. These directions are executed by the focal handling unit (central processor) of a PC, and they structure the reason for additional perplexing tasks. cufiye A few instances of essential PC directions include: 1.Load: This guidance moves information from the memory to a computer processor register. 2.Store: This guidance moves information from a computer chip register to the memory. 3.Add: This guidance adds two qualities and stores the outcome in a register. 4.Subtract: This guidance deducts two qualities and stores the outcome in a register. 5.Multiply: This guidance duplicates two qualities and stores the outcome in a register. 6.Divide: This guidance isolates two qualities and stores the outcome in a register. 7.Branch: This guidance changes the program counter to a predefined address, which is utilized to execute restrictive and genuine leaps. 8.Jump: This guidance changes the program counter to a predefined address. 9.Compare: This guidance looks at two qualities and sets a banner demonstrating the consequence of the examination. 10.Increment: This guidance adds 1 to a worth in a register or memory area. The set of instructions incorporated in 16 bit IR register are: Arithmetic, logical and shift instructions (and, add, complement, circulate left, right, etc) To move information to and from memory (store the accumulator, load the accumulator) Program control instructions with status conditions (branch, skip) Input output instructions (input character, output character) Symbol Hexadecimal Code Description AND 0xxx 8xxx And memory word to AC ADD 1xxx 9xxx Add memory word to AC LDA 2xxx Axxx Load memory word to AC STA 3xxx Bxxx Store AC content in memory BUN 4xxx Cxxx Branch Unconditionally BSA 5xxx Dxxx Branch and Save Return Address ISZ 6xxx Exxx Increment and skip if 0 CLA 7800 Clear AC CLE 7400 Clear E(overflow bit) CMA 7200 Complement AC CME 7100 Complement E CIR 7080 Circulate right AC and E CIL 7040 Circulate left AC and E INC 7020 Increment AC SPA 7010 Skip next instruction if AC > 0 SNA 7008 Skip next instruction if AC < 0 SZA 7004 Skip next instruction if AC = 0 SZE 7002 Skip next instruction if E = 0 HLT 7001 Halt computer INP F800 Input character to AC OUT F400 Output character from AC SKI F200 Skip on input flag SKO F100 Skip on output flag ION F080 Interrupt On IOF F040 Interrupt Off Uses of Basic Computer Instructions : Some of the key uses of basic computer instructions include: Data manipulation: Basic computer instructions are used to manipulate data stored in the computer system, including moving data between memory and the CPU, performing mathematical operations, and performing logical operations. Control flow: Basic computer instructions are used to control the flow of instructions within the computer system. geholapexisege This includes branching to different parts of the program based on specified conditions and jumping to a specific memory location. bojemuhobumu

Basic Input-Output Instructions

Symbol	Hex. Code	Description
INP	F800	Input character to AC
OUT	F400	Output character from AC
SKI	F200	Skip on input flag
SKO	F100	Skip on output flag
ION	F080	Interrupt on
IOF	F040	Interrupt off

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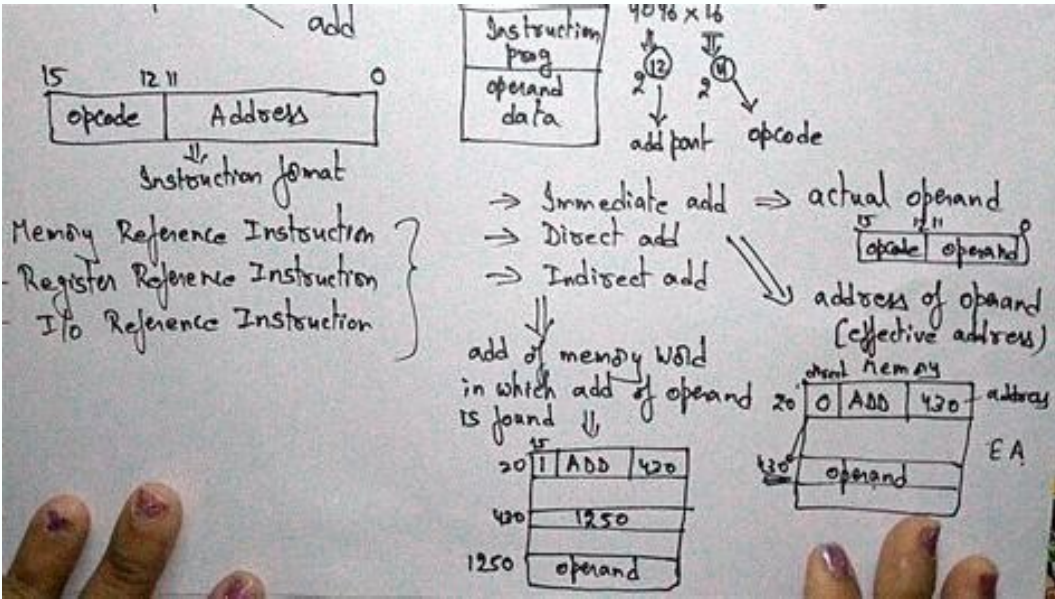

Input & Output Instructions

- CPU communicates with the peripherals through I/O registers called I/O ports.
- There are 2 instructions, IN & OUT, that access the ports directly.
- These instructions are used when fast I/O is essential ……. in a game program.
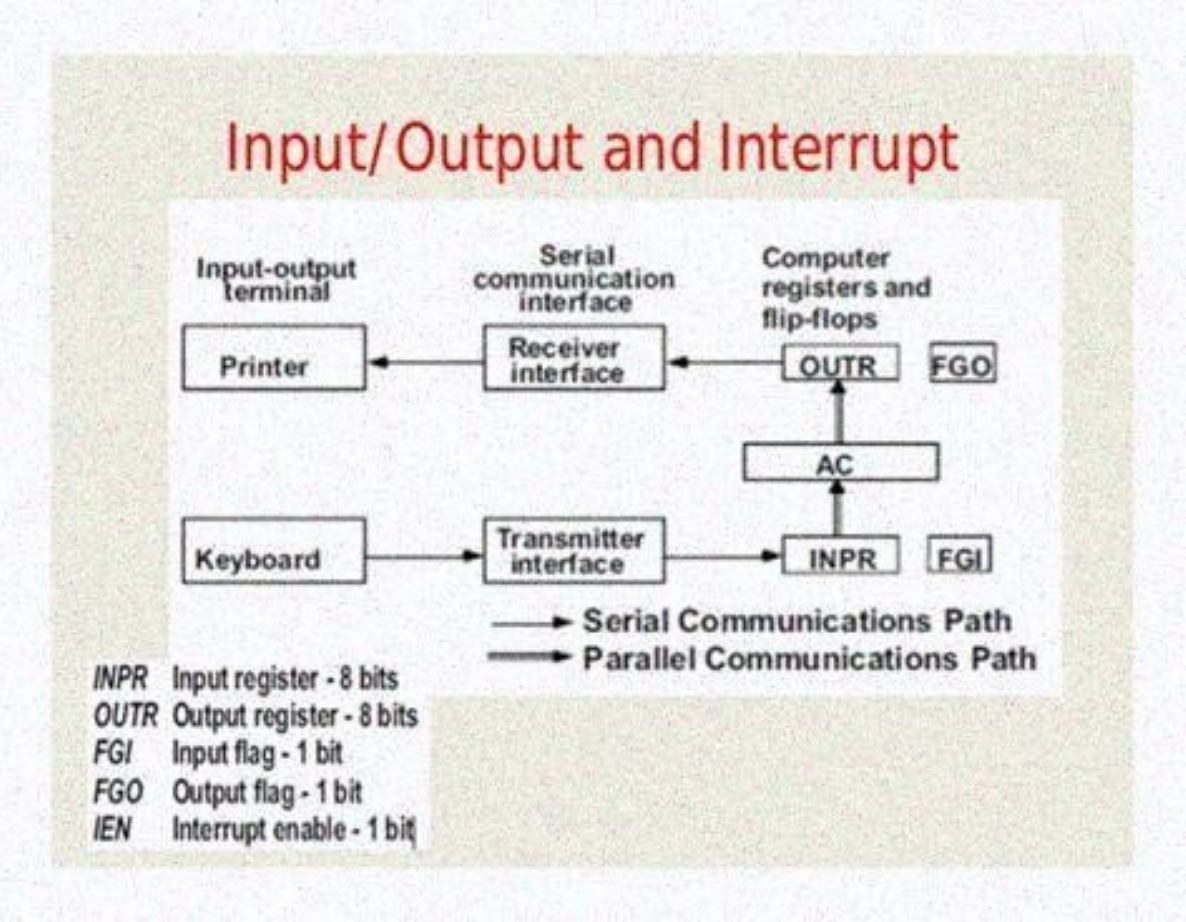
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This can make it challenging to write secure code and can require additional measures to be taken to protect the system. Maintenance: Basic computer instructions can be difficult to maintain, particularly as systems become more complex and code becomes more extensive. This can require significant resources to maintain and update the code, which can be challenging for organizations with limited resources. Whether you're preparing for your first job interview or aiming to upskill in this ever-evolving tech landscape, GeeksforGeeks Courses are your key to success. We provide top-quality content at affordable prices, all geared towards accelerating your growth in a time-bound manner. Join the millions we've already empowered, and we're here to do the same for you. Don't miss out - check it out now! Last Updated : 21 Apr, 2023 Like Article Save Article Networking carrier cloud A carrier cloud is a cloud computing environment that is owned and operated by a traditional telecommunications service provider. data link layer The data link layer is the protocol layer in a program that handles how data moves in and out of a physical link in a network. CPRI (Common Public Radio Interface) CPRI (Common Public Radio Interface) is a specification for wireless communication networks that defines the key criteria for ... Security CIO HRSoftware employee resource group (ERG) An employee resource group is a workplace club or more formally realized affinity group organized around a shared interest or ... employee training and development Employee training and development is a set of activities and programs designed to enhance the knowledge, skills and abilities of ... employee sentiment analysis Employee sentiment analysis is the use of natural language processing and other AI techniques to automatically analyze employee ... Customer Experience buyer persona A buyer persona is a composite representation of a specific type of customer in a market segment. high-touch customer service High-touch customer service is a category of contact center interaction that requires human interaction. digital marketing Digital marketing is the promotion and marketing of goods and services to consumers through digital channels and electronic ...
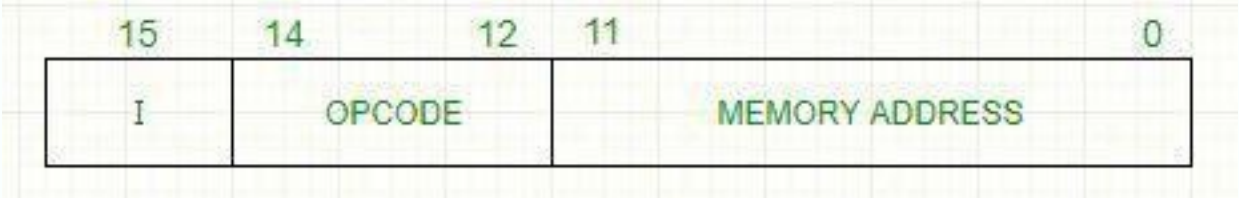

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