



SNS COLLEGE OF ENGINEERING



Kurumbapalayam(Po), Coimbatore – 641 107

Accredited by NAAC-UGC with 'A' Grade

Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

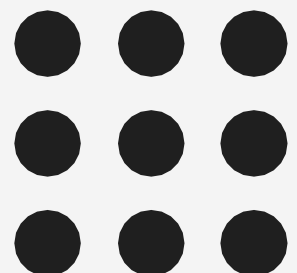
Department of Information Technology

**Course Name – 19IT301 Computer Organization and
Aechitecture**

II Year / III Semester

Unit 1 – Basic Structures of Computers

Topic :Basic Operational Concept





Basic Operational Steps



- Activity in a computer is governed by instructions.
- To perform a task, an appropriate program consisting of a list of instructions is stored in the memory.
- Individual instructions are brought from the memory into the processor, which executes the specified operations.
- Data to be used as operands are also stored in the memory.

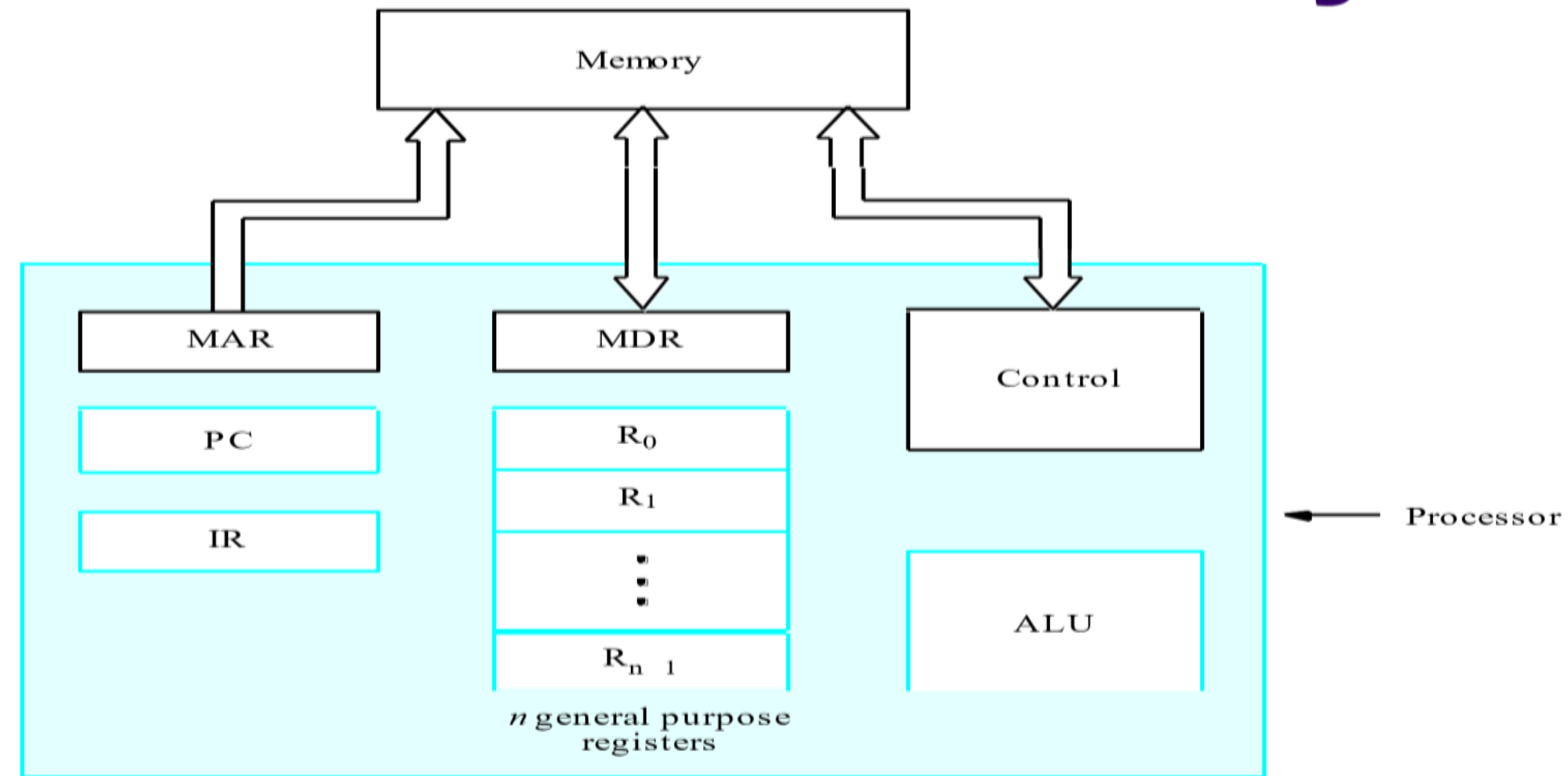


Typical Instruction



- Add LOCA, R0
- Add the operand at memory location LOCA to the operand in a register R0 in the processor.
- Place the sum into register R0.
- The original contents of LOCA are preserved. The original contents of R0 is overwritten.
- Instruction is fetched from the memory into the processor – the operand at LOCA is fetched and added to the contents of R0 – the resulting sum is stored in register R0.
- Load LOCA, R1
- Add R1, R0

Connections between processor and memory





Registers



- Instruction register (IR)
- Program counter (PC)
- General-purpose register ($R_0 - R_{n-1}$)
- Memory address register (MAR)
- Memory data register (MDR)



Typical Operating Steps



- Programs reside in the memory through input devices
- PC is set to point to the first instruction
- The contents of PC are transferred to MAR
- A Read signal is sent to the memory
- The first instruction is read out and loaded into MDR
- The contents of MDR are transferred to IR
- Decode and execute the instruction



Typical Operating Steps



- **Get operands for ALU**
- General-purpose register
- Memory (address to MAR – Read – MDR to ALU)
- Perform operation in ALU
- Store the result back
- To general-purpose register
- To memory (address to MAR, result to MDR – Write)
- During the execution, PC is incremented to the next instruction



Interrupt



- Normal execution of programs may be preempted if some device requires urgent servicing.
- The normal execution of the current program must be interrupted – the device raises an *interrupt* signal.
- Interrupt-service routine
- Current system information backup and restore (PC, general-purpose registers, control information, specific information)



THANK YOU