

Parallel Computing & Distributed System



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Parallel computing and Distributed System

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More Notes Coming Soon

Chapter 1: Parallel computing

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1. Introduction to Parallel computing (Basics)
2. What are parallel computers? Explain Parallel computer classification based on Architecture
3. Explain Parallel computing classification based on Architectural schema
 - flynn classification
 - feng's classification
 - shore's classification
 - Handler's classification

Parallel Computing

Defination: Parallel computing is a type of

Note

(Bracket me tumhari understanding ke liye likha hai not for exams) computation (act of mathematical calculation or use of computer) in which many calculation or the execution of the process are carried out concurrently

(Parallel computing simple me bolo toh ek badi problem ko small tukdo me batoo aur un small tukdo ko alag processor pe execute karo ek saath taki jo kaam hai woh speed me ho)

Example: $a * b + c * d$ just imagine yeh task

Perform karna hai

serial computing: line se jana padenga ek his processor pura task execute karunga

Parallel computing: task ko divide kar denge aur alag alag processor ko denge.

$$t_1 = a * b$$

\downarrow
 P_1

$$t_2 = c * d$$

\downarrow
 P_2

$$t_3 = t_1 + t_2$$

\downarrow
 P_3

(isme P_1 and P_2 ek saath kaam karunge)

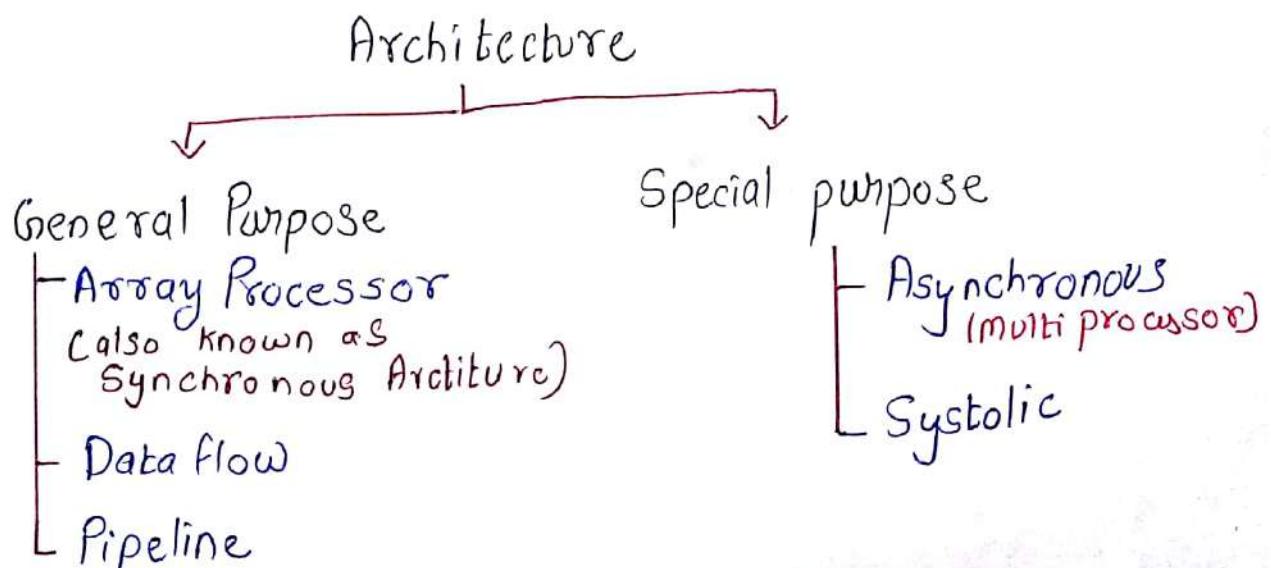
Q) What are parallel computers? Explain parallel computer classification based on Architecture?

→ parallel computers are those system that emphasizes (uses or focus on) parallel processing or parallel computing

- parallel computing makes use of multiple computing resources to solve a complex computation problem in which the Problem is broken into discrete parts that can be solved concurrently.
- Each part is further broken into series of instruction which execute simultaneously on different processors using overall controls or coordination mechanism.

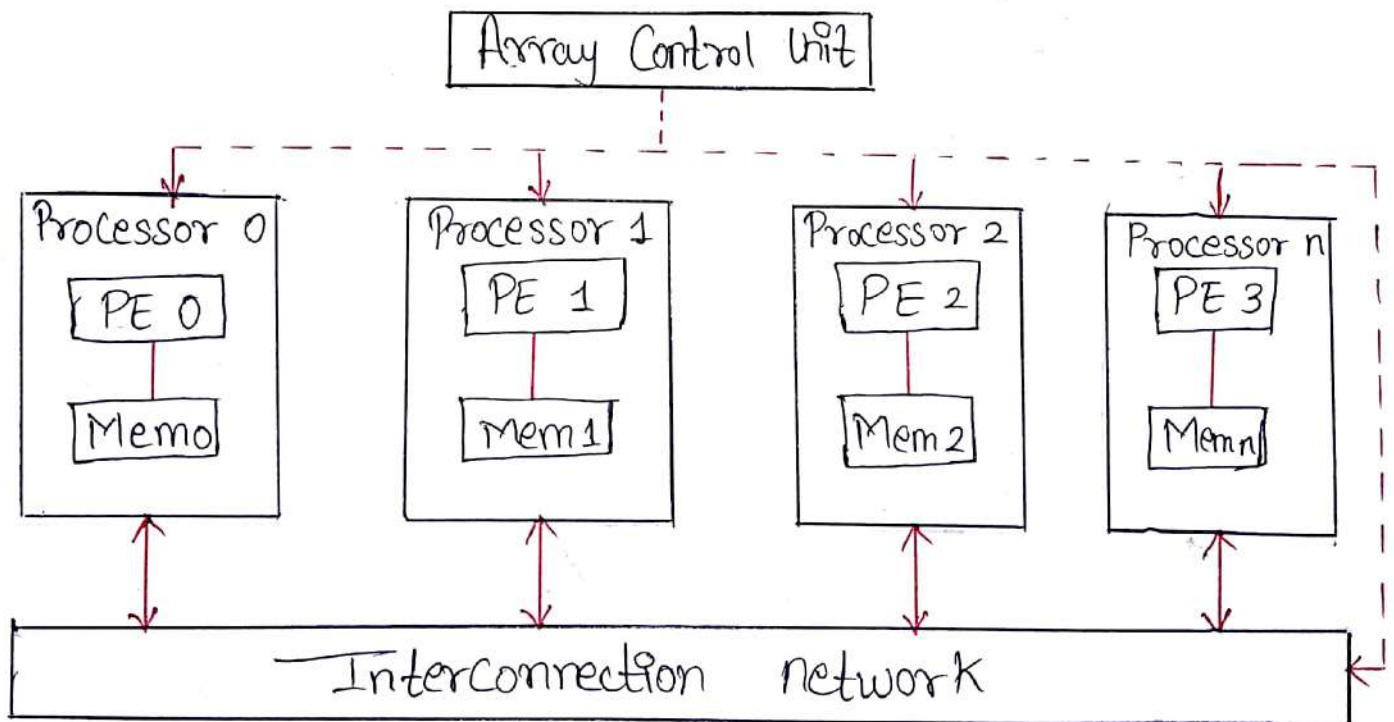
Classification of Parallel computer based on architecture.

- There are 5 different Parallel architecture



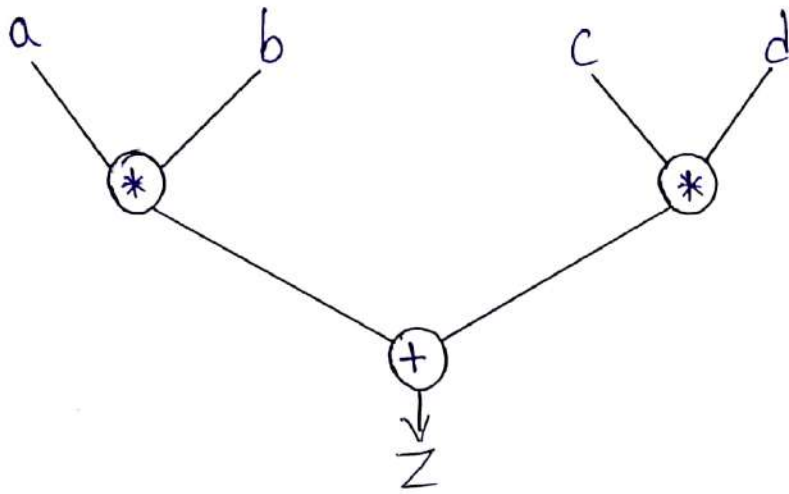
Array Processor :-

- A synchronous parallel computer with multiple ALU called processing element (PE) that operate in parallel is called array processor.
- All PEs are synchronized and connected by an interconnection network to perform same function at same time.
- Each PE is equipped with some register and local memory.
- Instructions are fetched and broadcasted to all PEs by common control unit.
- This type of architectural arrangement is termed as SIMD.



Data Flow Architecture

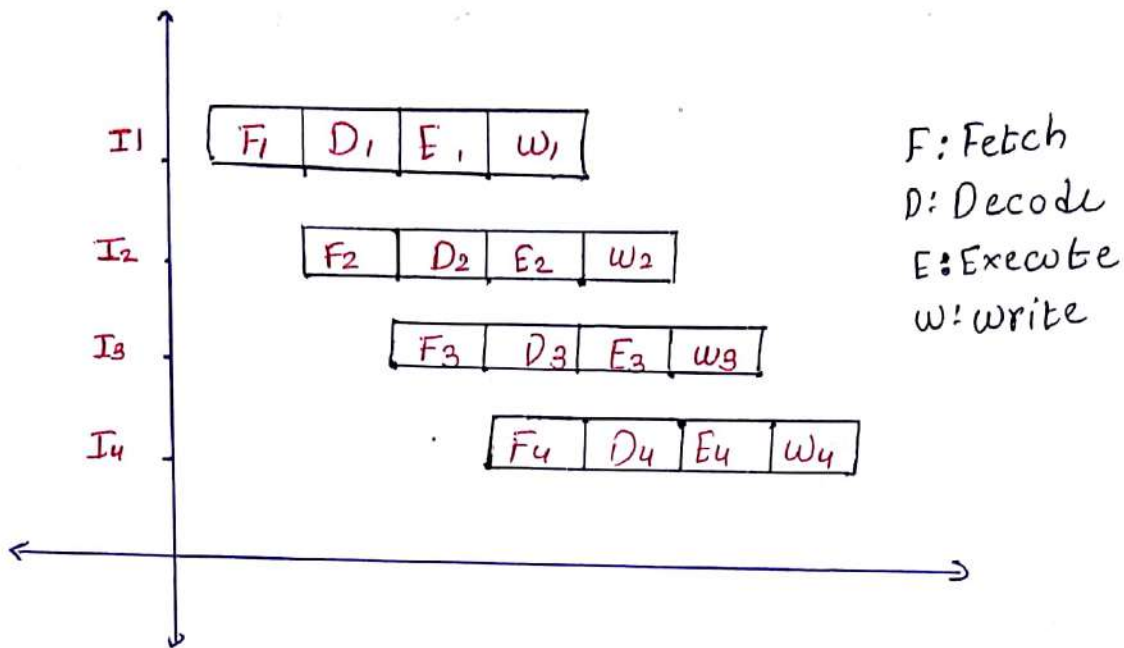
- Uses data-driven model in which pgm is represented using DAG (Direct Acyclic Graphs).
- Graph contains nodes and edges.
- node : instructions, edge : data dependency relationship between connected nodes.
- Popular dataflow languages : SISAL, LISP, Silage.



- Advantages :
- 1] Provides very high potential for parallelism.
 - 2] Gives high throughput for complex computation.

- Disadvantages :
- 1] Time lost in waiting for arguments.
 - 2] High control overhead.
 - 3] Difficult to manipulate data ~~str~~ structure.

Pipeline architecture



- Pipelining is a technique where multiple instructions are overlapped during execution
- pipeline is divided into stages and these stages are connected with one another to form a pipeline structure
- instruction enters from one end and exits from another end
- It is used to enhance the performance of the processor.

(ek baar video dekh lena last moment tuition)

pe : fir bahut acche se samajh jayenga)

Strongly suggest to see
Sandeep maheshwari
videos



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