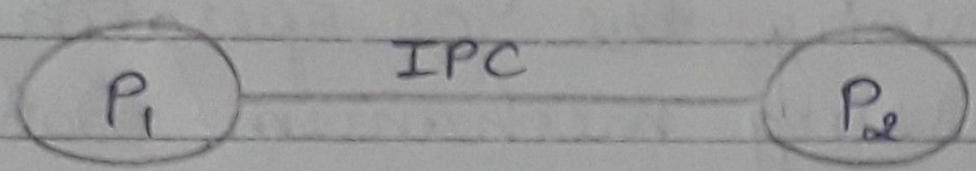
classmate
Date 29th Aug'19
Page

- Call & return architecture

Methods are invoked → TOP DOWN STYLE
→ OBJECT ORIENTED STYLE
→ LAYERED STYLE

* Interprocess Communication (IPC) :-

- IPC is the mechanism provided by the OS that allows processes to communicate with each other.



Basics -

1) Information sharing
2) Computation speed-up
3) Modularity - Dividing the system func^ns into split processes.
4) Convenience - Single user may work on many tasks at a time.

Different Models of IPC -

1) Shared Memory :

- Shared memory is a region of memory which is shared by co-operating processes gets established.

Cloud Computing ....

* Parallel Computing :-

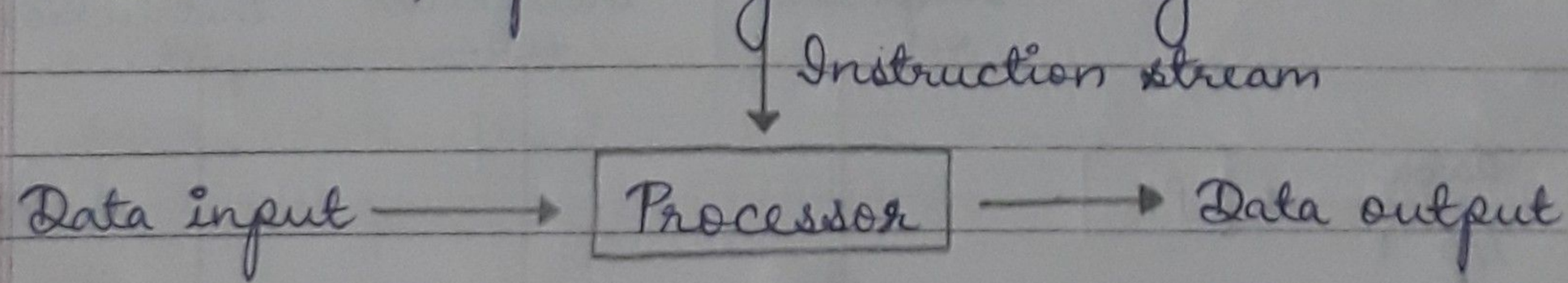
- Parallel computing refers to a model in which the computation is divided among several processors sharing the same memory.
- Homogeneity of components.

* Hardware architectures for parallel computing -

- 4 categories :-
  - (i) Single Instruction, Single Data (SISD)
  - (ii) Single Instruction, Multiple Data (SIMD)
  - (iii) Multiple Instruction, Single Data (MISD)
  - (iv) Multiple Instruction, Multiple Data (MIMD)

- **SISD →**

An SISD Computing System is a uni-processor machine which is capable of executing a single instruction, operating on a single data stream.



- **SIMD →**

An SIMD is a multi-processor machine capable of executing the same instruction on all the CPU, but operating on different data streams.

⊛ Difference b/w :

Parallel Computing	Distributed Computing
1) Single computer	Multiple computers.
2) Multiple processors execute multiple tasks at the same time.	Multiple computers perform tasks at the same time.
3) Share memory / distributed memory.	Each computer has it's own memory.
4) Commⁿ using bus.	Commⁿ using network.
5) Increase the performance of the system.	Allows scalability, shared resources & helps to perform computation tasks efficiently.

→ Components of distributed systems :

There are different layers that are involved in providing the services of distributed systems.

Elements -

Social networks
Scientific computing
Enterprise applⁿ } Application (Saas)

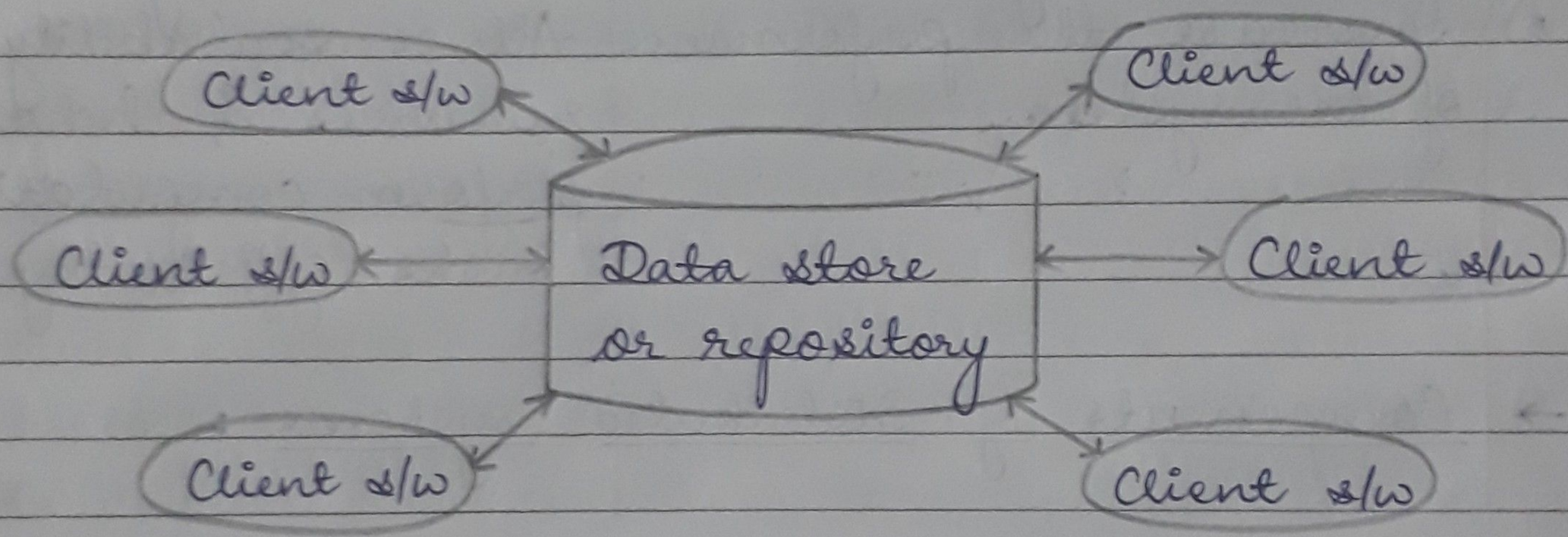
Frameworks for cloud applⁿ development } Middleware (Paas)

Virtual h/w, OS images, Networking & Storage } H/w & OS (Iaas)

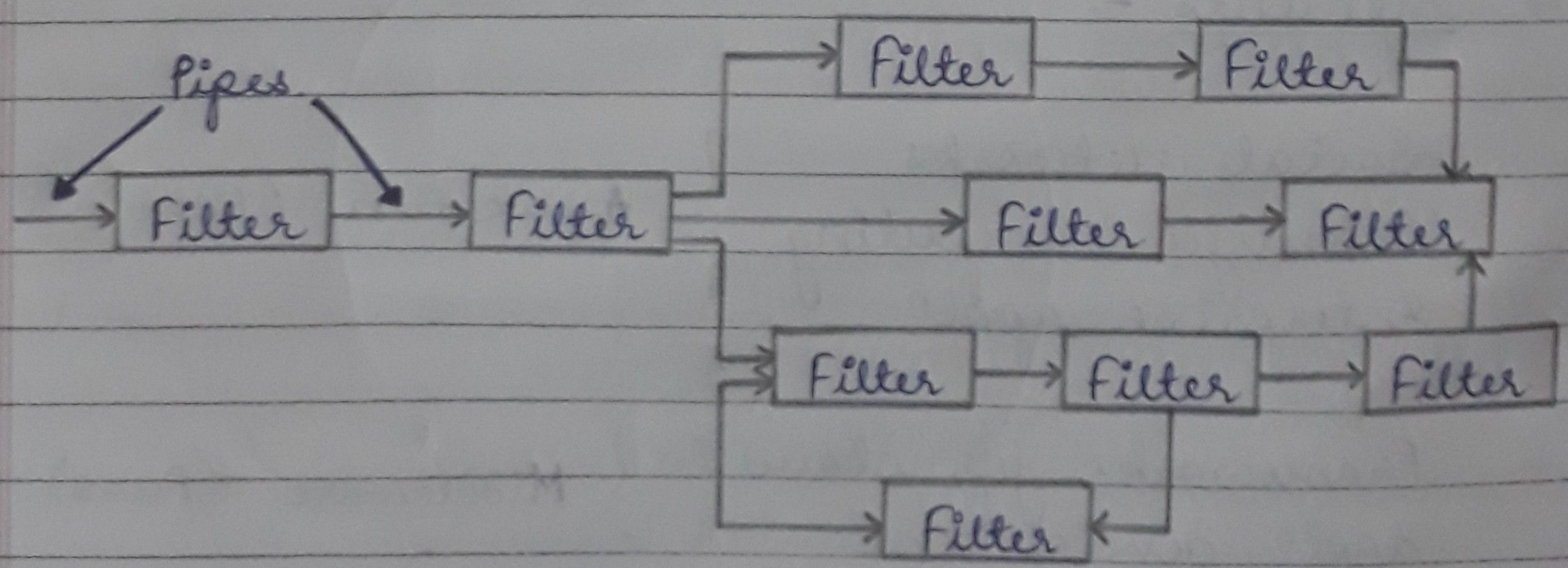
* Architectural Styles :-

- 2 major classes -
  - (i) Software architectural style (Based on logical arrangement of the software components)
  - (ii) System architectural style.

- Data centered architecture



- Data flow architecture



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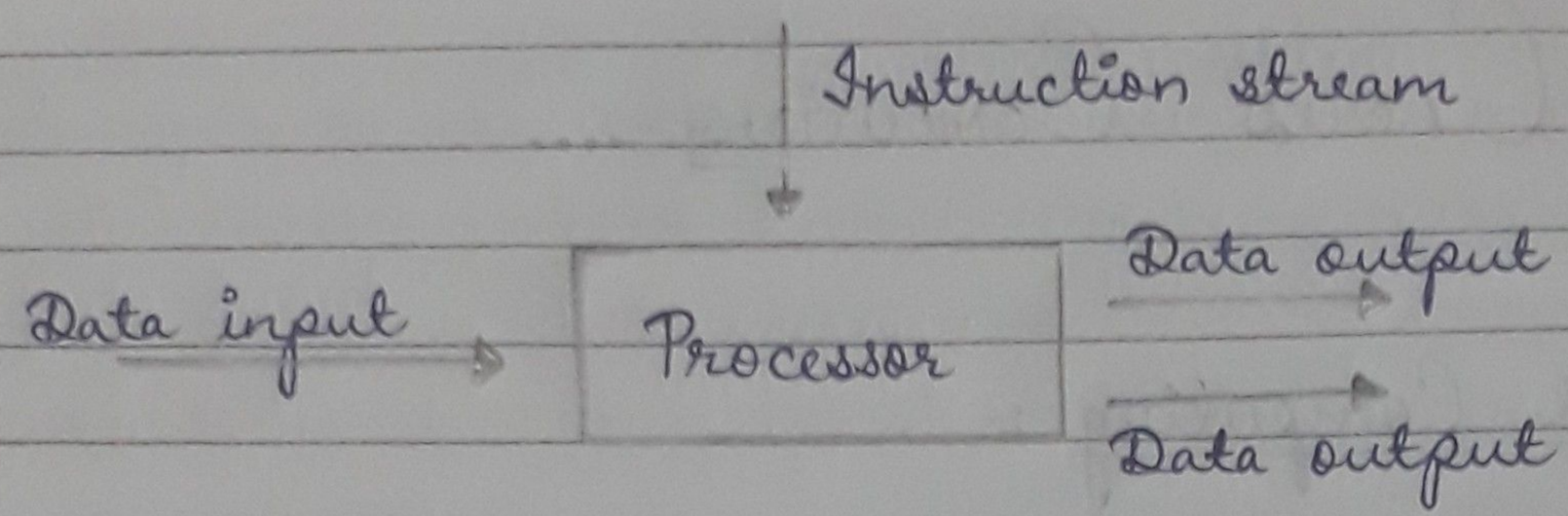
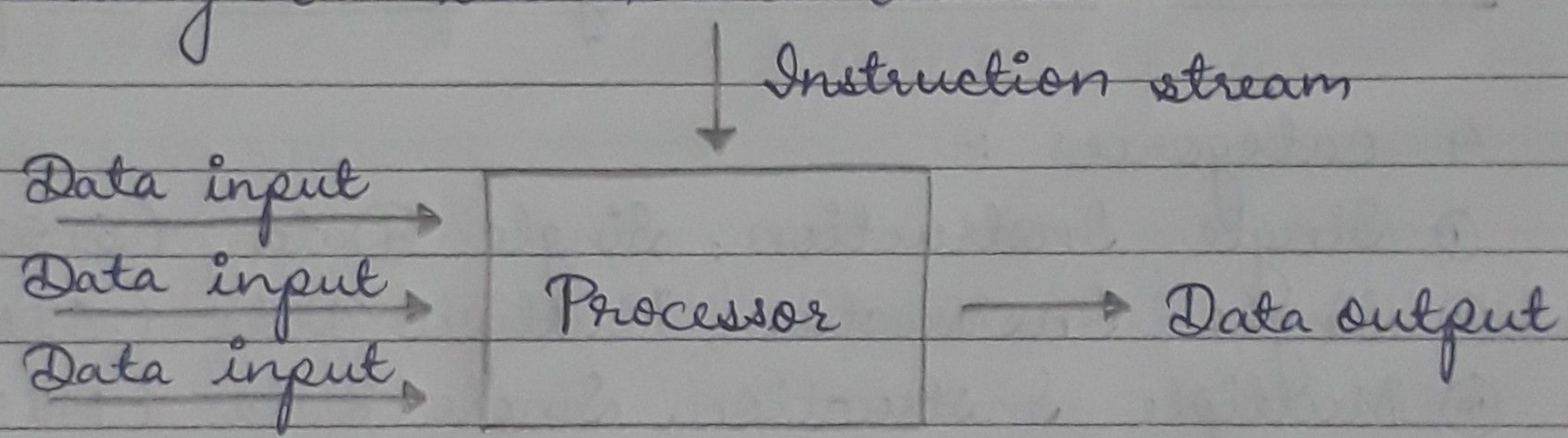


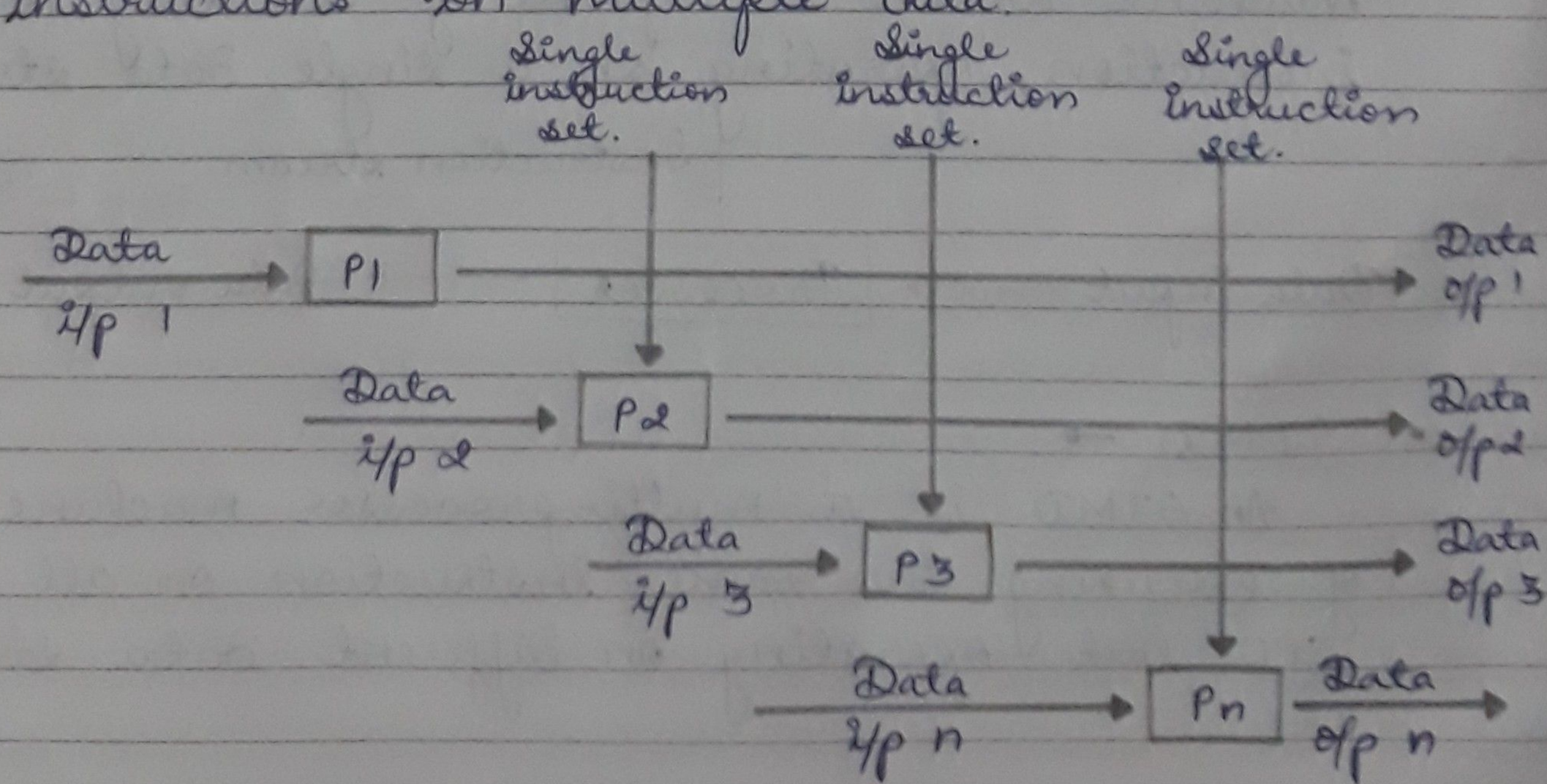
- MISD →

An MISD Computing System is a multi-processor machine capable of executing different instructions on different PCs but, all of them operating on the same dataset.



- MIMD →

An MIMD system is a multiprocessor machine which is capable of executing multiple instructions on multiple data.



Msg contains :-

(i) Header of msg → Identifies the sending & receiving processes...
(ii) Block of data
(iii) Pointers to the block of data
(iv) Some ctrl info abt the process...

* Technologies for distributed computing :-

1) RPC (Remote Procedure Calls)
2) Distributed Object Framework
3) Service-oriented Computing

RPC →

- A program on 1 computer on a network uses a RPC to make a request of a program on another computer on the network, without knowing the network details.
- The RPC protocol is a n/w programming model for point-to-point commⁿ within or between a software applⁿ.
- An RPC is also known as SUB-ROUTINE CALL or FUNCⁿ CALL.

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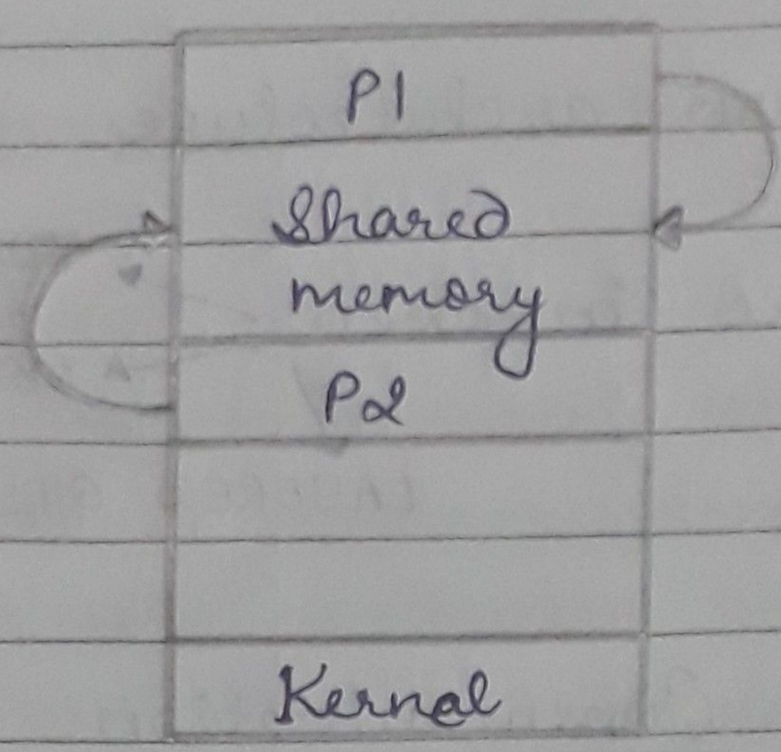
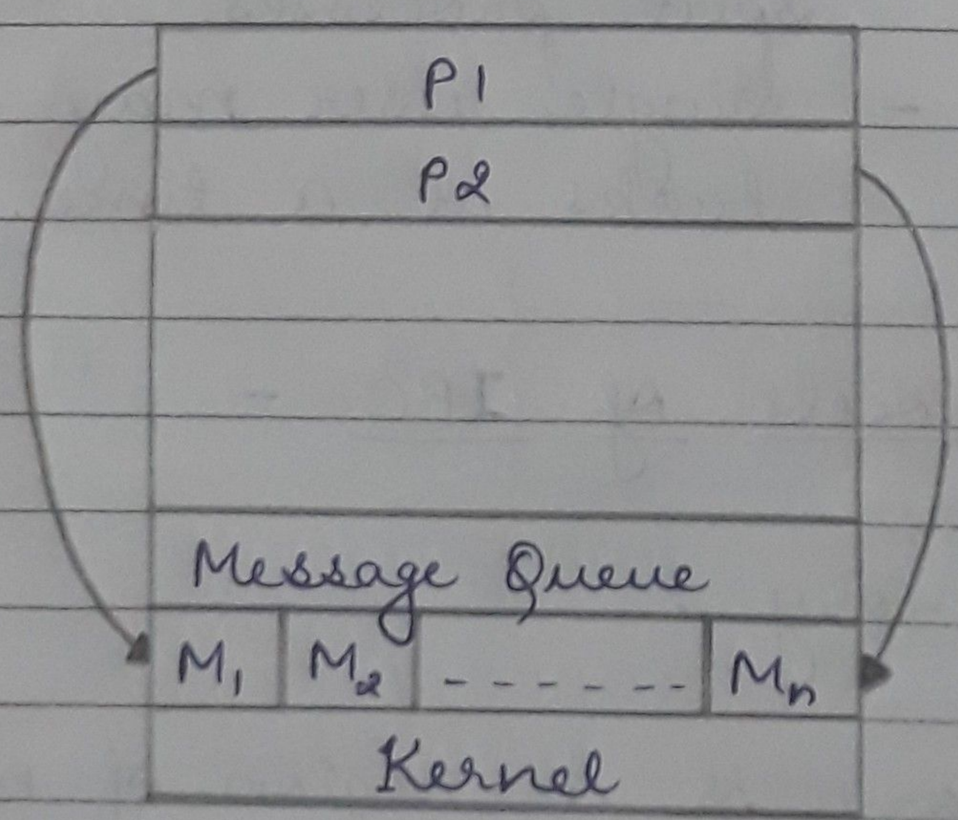


2) Message Passing :

- Commⁿ takes place by the way of message exchanged among the co-operating processes.
- In msg passing mechanism, data is exchanged b/w processes through kernel of OS using system calls.
- Mechanism is easier to implement than the shared memory.
- Msg passing is useful for exchanging smaller amount of data.



- Msg passing technique is slower than shared memory technique.

* Computing Platforms & Technologies :

1) AWS (Amazon Web Services)
2) Google App Engine
3) Microsoft Azure
4) Hadoop
5) force.com and salesforce.com

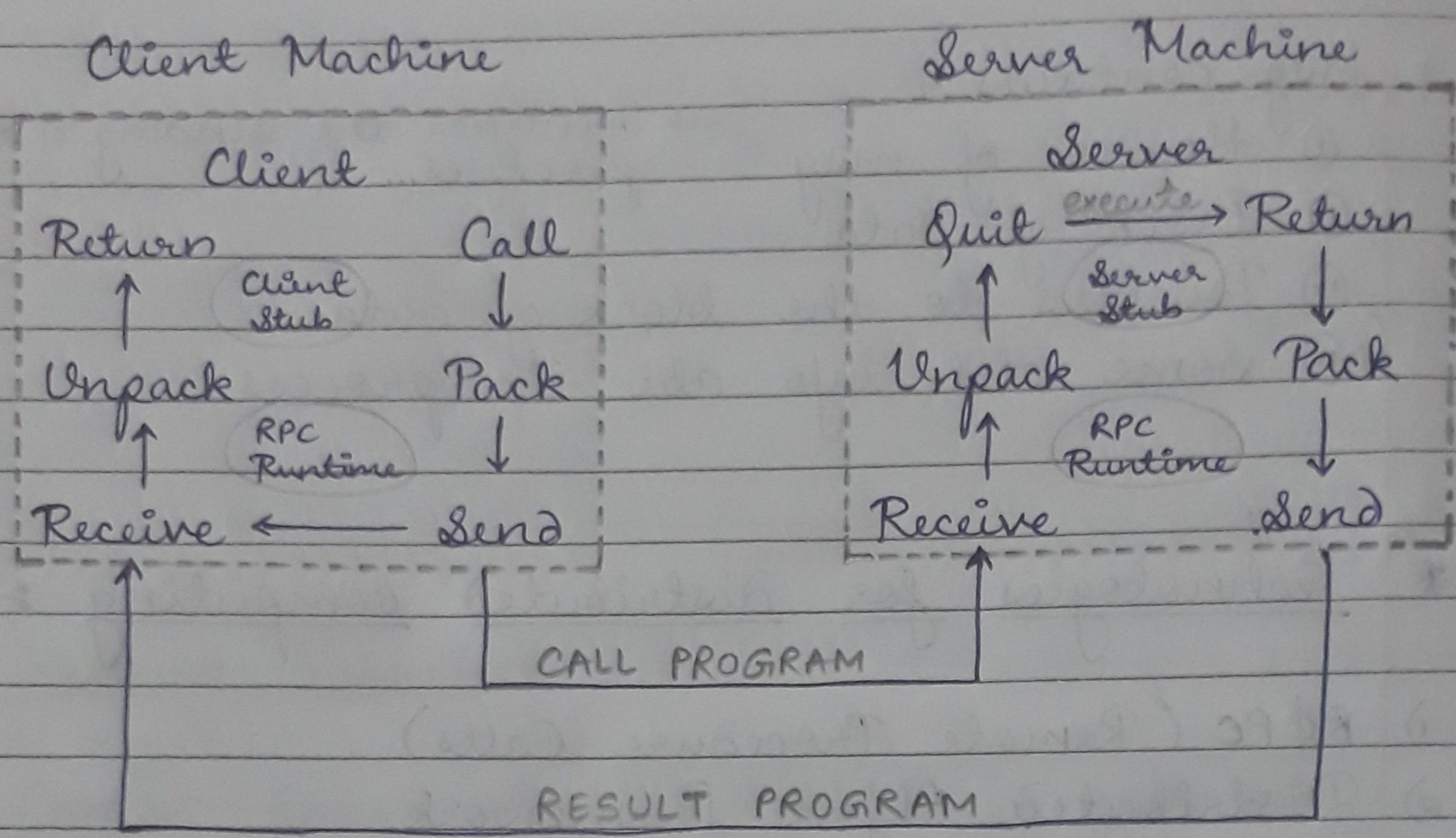
* Historical Developments -

1) Distributed systems
2) Virtualization
3) Web 2.0
4) Service orientation
5) Utility computing

* DISTRIBUTED SYSTEMS -

→ Properties :

(i) Heterogeneity
(ii) Openness
(iii) Scalability
(iv) Transparency
(v) Concurrency
(vi) Continuous availability
(vii) Independent failures.



Distributed Object Framework →

- D.O.F. extend object-oriented programming systems by allowing the obj to be distributed across a heterogeneous network & provide facilities so that they can coherently act as though they were in the same address space.

(4)

→ They are classified into 3 classes :
(i) Mainframe computing
(ii) Cluster computing
(iii) Grid computing

27th Aug'19

Parallel Computing	Distributed Computing
1) A single processor executing one task after the other, is not an efficient method in a computer.	On the other hand, the distributed computing allows multiple computers to communicate with each-other & acheive a goal.
2) It provides a solution to this issue as it allows multiple processors to execute task at the same time	All these computers communicate with each other by passing message via the network.
3) Modern computers support parallel computing to increase the perform-ance of the system.	Organizations such as Facebook & Google, widely use distributed computing to allow the users to share resources

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