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DS Assignment 1, [illegible]

1) Different dimensions used to provide distinction in coordination model:—
- temporal
- referential

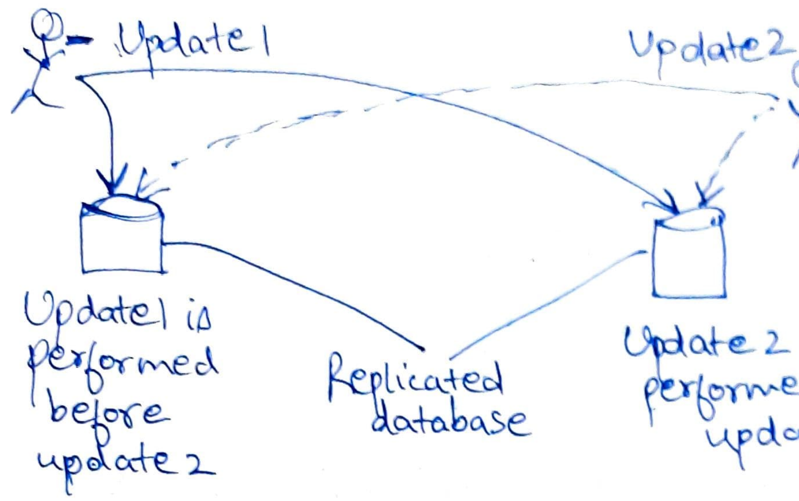
		Temporal Coupled	Temporal Decoupled
Referential	Coupled	Direct	Mailbox
	Decoupled	Meeting oriented	General communicative

A taxonomy of coordination models

When processes are temporally and referentially coupled, coordination takes place in a direct way, referred to as direct coordination. The referential coupling generally appears in the form of explicit referencing in communication.
For example, a process can communicate only if it knows the name or identifier of the other processes it wants to exchange information with.
Temporal coupling means that processes that are communicating will both have to be up and running. This coupling is analogous to the transient message-oriented communication.

A different type of coordination occurs when processes are temporally decoupled but referentially coupled, which we refer to as mailbox coordination. In this case, there is no need for two communicating processes to execute at the same time in order to let communication take place. Instead, communication takes place by putting messages in a (possibly shared) mailbox. This situation is analogous to persistent message-oriented communication. It is necessary to explicitly address the mailbox that will hold the message that are to be exchanged. Consequently, there is a referential coupling.

2)


Update 1
Update 2
Update1 is performed before update 2
Replicated database
Update 2 is performed before update 1

Scenario:-

To improve query performance, a bank may place copies of an account ~~balance~~ database on 2 different cities, say New York & San Francisco. A query is forward to the nearest copy. The price for a fast response to a query is partly paid in higher update costs, because each update operation must be carried out at each replica. Assume a customer in San Francisco wants to add $100 in his account, which currently contains $1000. At the same time, a bank employee in NY intiates an update by which the customer's account is to be increased with 1%.

Sol:-

Consider a group of processes multicasting messages to each other. Each message is always timestamped with the current (logical) time of its sender. When a message is multicast, it is conceptually also sent to the sender. Here Lamport's logical clocks are used to implement total-ordered multicasts. When a process receives a message, it is put into a local queue, ordered according to its timestamp. The receiver multicasts an acknowledgement to the other processes. At that point, the msg is removed from the queue & handed over to the application; the associated acknowledgments can simply be removed. Because each process process has the same copy of the queue, all messages are delivered in the same order everywhere. In other words, we have established total-ordered multicasting.