DBMS Assignment -02

Write down the detailed concept of CAP Theorem

CAP Theorem :-

Three desirable properties of distributed systems with replicated data.

Consistency, Availability, Partition tolerance

Consistency :-

Nodes will have the same copies of a replicated data item visible for various transactions.

Availability :-

Each read or write request for a data item will either be processed successfully or will receive a message that the operation cannot be completed.

Partition tolerance :-

The system can continue operating if the network connecting the nodes has a fault that results in two or more partitions, where the nodes in each partitions, where the nodes in each position can only communicate among each other.

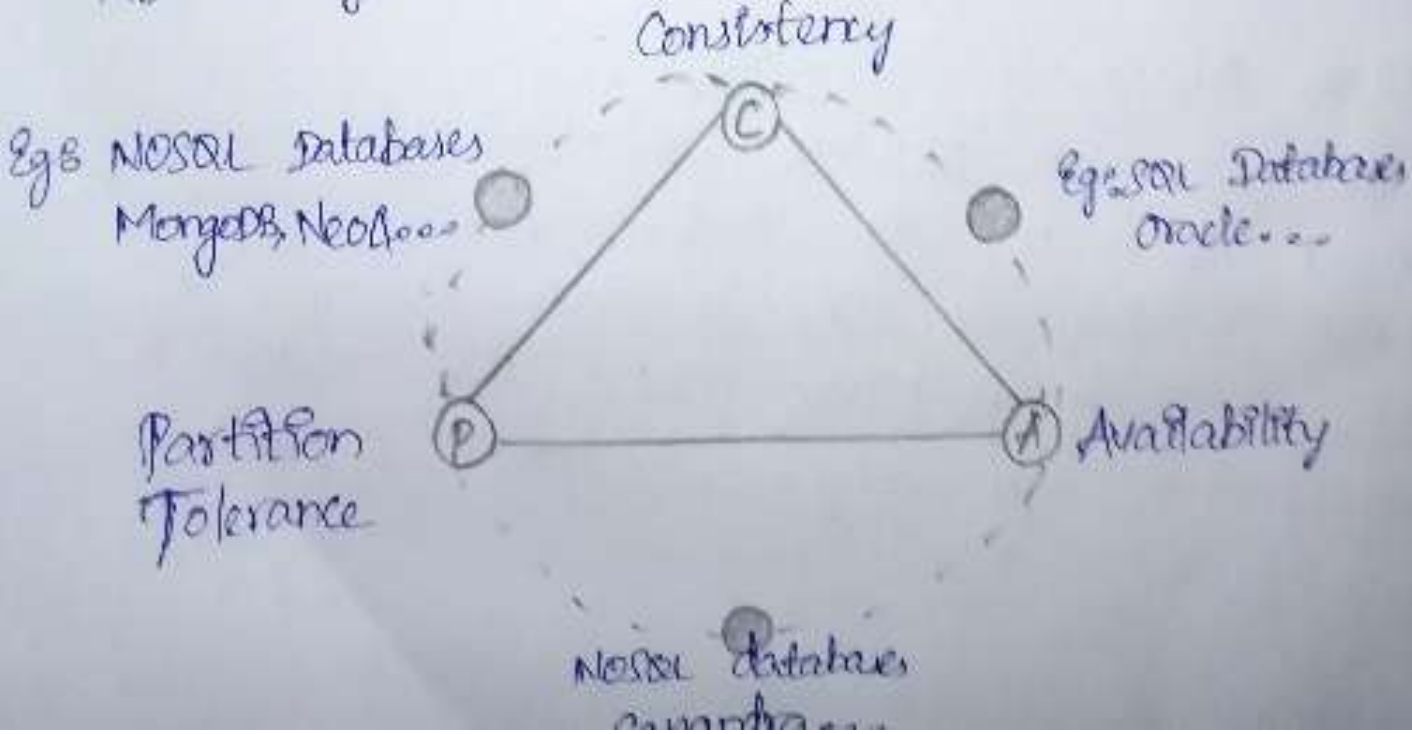
CAP Theorem:-

It states that it is not possible to guarantee all three of the desirable properties at the same time in a distributed system with data replication.

If this is the case, then the distributed system designer would have to choose two properties out of the three to guarantee.

NOSQL distributed data stores, a weaker consistency level is often acceptable, and guaranteeing the other two properties (availability, partition tolerance) is important.

Eventual consistency is often adopted in NOSQL systems.



Key-value Databases:-

* Key-value stores focus on high performance, availability and scalability by storing data on a distributed storage system.

* The key is a unique identifier associated with a data item and is used to locate this data item rapidly.

* The value is the data item itself, and it can have very different formats for different key-value storage systems.

* In some cases, the value is just a string of bytes or an array of bytes, and the application using the key-value store has to interpret the structure of the data value.

* In other cases, some standard formatted data is allowed; for eg: structured data rows (tuples) similar to relational data, ore semistructured data using JSON or some other self describing data format.

* Different key-value stores can thus store unstructured, semistructured or structured data items.

* The main characteristic of key value stores is the fact that every value (data item) must be associated with a unique key, and that retrieving the value by supplying the key must be very fast.