

Assignment (Video- 22 to 24): Database System Impl. (COP6726)

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- 1) **Database Scheduler:** a scheduler in a database system is responsible to manage different tasks or jobs taking place in database environment. A scheduler provides database administrators control over database processes which are taking place inside the system. These database jobs or tasks could be performed by the database administrators as well but as these tasks could be time consuming and complicated hence use of a scheduler can improve the management and planning of these tasks. By using Scheduler, the human intervention could be reduced to perform these tasks which can lead to more efficacy and less human errors also by using a scheduler more complex tasks could be performed with ease in reliable way. The most common scheduler tasks are, performing tasks or jobs on the basis of time or events. The other important tasks could be processes which are organized as per the business requirements. Some the examples of scheduler processes could be scheduling and monitoring recurring database maintenance jobs such as backups or nightly data warehousing loads and extracts.
- 2) **Staging Area in Databases:** Staging are also called landing zones. When the extract operation is performed (extract , transform and load operations) then staging area is used as an intermediate storage for the purpose of data processing.in the data extraction process the data is taken out from a data source such as database or warehouse and then this data is transferred to a target destination which could be again a database or warehouse system as well as it could be a simple file system as well. When the extraction process is done the data is kept in intermediate location before it is finally transferred to target location. This area is called staging area where data is staged before it is transformed and loaded into destination systems. These intermediate data locations are transient in nature that means once the ETL operations are performed successfully then these memories are erased, and they don't have any traces of previous data which was kept here.
- 3) **Selection, Projection, Joining in databases:** The select statement encompasses three main concepts from relational theory these concepts are selection, projection and joining. The selection operation is denoted by sigma, basically a select operation selects a subset of the tuples by using the selection condition or predicate. this operation is used to retrieve tuples or records which meet a certain criterion. Selection operation selects the subset of rows out of all available rows in the database table as per the selection predicate condition. On the other hand, the projection operation selects the subset of all available columns. The result table from a projection operation might contain a single column or it might also contain all the columns present in the table. Finally, we have joining, A join operation combines data from two or more tables based on one or more common column values. A join operation enables an information system user to process the relationships that exist between tables. A database join query performs a join operation in relation algebra which combines

columns from one or more tables in a relational database. It creates a set that can be saved as a table or used as it is. There various types of joins such as symmetric vs asymmetric.

- 4) **Left Hand Side Vs Right Hand Side Lookup:** The way predicates are written in a query matter. logically various different forms of predicates are same. for example, there is a significant difference in left hand side and right-hand side predicates in case of equality and inequality operators. In databases the query statement predicates are transformed into canonical forms in those canonical forms the LHS only contains the indexed column name.in case of left hand side lookup the LHS lookup is done when the variable is present to the left of the assignment operator on the other hand a right hand side lookup is done when the variable is present at the right hand side of the assignment variable.
- 5) **LOCK vs NOLOCK in databases:** IN case of databases the database engines make use of some special types of controls when the database engine is modifying its data. These exceptional controls are called locks. generally, these locks are used by the database engines in order to maintain the database data integrity. The locks in a database record only indicate that this record went under a transaction by the database engine. THE database servers use different types of locks in order to isolate different types of transactions at different levels. The NOLOCK control is also known as READUNCOMMITTED. This type of lock only applies to select statements. This lock states that no shared locks can be issued against a table which prevents other transactions from modifying the data present in the table.
- 6) **Cray MTA- 2:** The Cray MTA-2 is a shared memory MIMD computer produced by Cray organization. It si based out of tera computer design which was designed by Tera computer. The MTA in Cray MTA-2 relates to tera computers as they are also called MTA. The tera computers have an unusual design and it turned out to be nearly impossible to manufacture those computers because of their aggressive packaging and circuit technology. Cray MTA-2 was designed in order to rectify those issues so that it could be manufactured without any problems. MTA-2 still maintains the same processor architecture as MTA while the network design is downgraded to 4-d Torus topology to a less efficient pone. The MTA computers design involved incorporating various technologies like A simple, whole-machine-oriented programming model, Hardware-based multithreading, Low-overhead thread synchronization.