WORKSHEET 1 – SQL

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1. a) Create

   d) Alter

2. a) Update

   b) Delete

   c) Select

3. b) Structured Query Language

4. b) Data Definition Language

5. a) Data Manipulation Language

6. c) Create Table A (B int, C float)

7. b) Alter Table A Add column D float

8. b) Alter Table A Drop column D

9. b) Alter Table A Alter Column D int

10. a) Alter Table A Add Primary Key B

11. **Data Warehousing** is a process to collect, transform, and store data from multiple heterogeneous sources so as to provide meaningful business insights. A Data warehouse is normally used to connect and analyze business data from a pool of sources. It is known by other names such as Decision Support System (DSS), Management Information System and Business Intelligence Solution. The three major types of data warehouses are enterprise data warehouse (EDW), operational data store (ODS), and data mart.

Example: Health care industry
A DWH is the backbone of healthcare systems because the latest, up-to-date treatment information is crucial for saving lives. EDWs are used to forecast outcomes, generate treatment reports, and share data with insurance providers, research labs.

12.

OLTP	OLAP
It is a well-known online database modifying system	It is a well-known online database query management system.
Consists of current operational data	Consists of historical data from various Databases.
In an OLTP database, tables are normalized (3NF).	In an OLAP database, tables are not normalized.
The data is used to perform day-to-day fundamental operations.	The data is used in planning, problem-solving, and decision-making.
The data integrity constraint must be maintained in an OLTP database.	The OLAP database is not often updated. As a result, data integrity is unaffected.
It is comparatively fast in processing because of simple and straightforward queries.	The processing of complex queries can take a lengthy time.
It is application-oriented. Used for business tasks.	It is subject-oriented. Used for Data Mining, Analytics, Decisions making, etc.

13. **Characteristics of Data Warehouse**

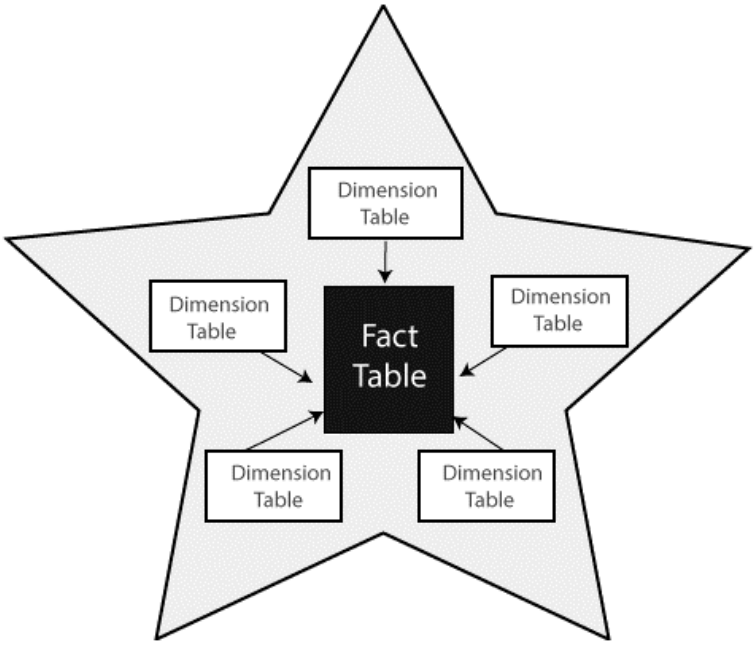
- **Subject Oriented** - Data warehouse is subject oriented as it delivers information about a theme instead of organization's current operations. It can be achieved on specific theme which is more defined, such as sales, distributions, marketing etc.
- **Integrated** - Data warehouse is a collection of integrated data from various sources of data such as transactional databases and operational reports. The mainframe and relational database are integrated to form a single unit, creating accessibility for analysis. Reliability in naming conventions, format and codes is also required when building a data warehouse.
- **Time Variant** - Time-variance is the feature of data warehouse which keeps data in chronological order and it defines the time element explicitly or implicitly. It comprises elements of time explicitly or implicitly. Another feature of time-variance is that once data is stored in the data warehouse then it cannot be modified, alter, or updated.
- **Non Volatile** - The data warehouse is the primary source of information for decision making. The data in data warehouse is permanent. It means that it will not be erased or deleted when new data is inserted into modifications between the selected quantity on logical business.

14. **Star Schema**

A star schema is a relational database design that represents the underlying multidimensional data model by creating a central fact table and surrounding it with dimension tables. The star schema can be used as an analytical vehicle for accessing data from multiple sources and forming aggregations across those sources.

Characteristics:

- It creates a DE-normalized database that can quickly provide query responses.
- It provides a flexible design that can be changed easily or added to throughout the development cycle, and as the database grows.
- It provides a parallel in design to how end-users typically think of and use the data.
- It reduces the complexity of metadata for both developers and end-users.



Star Schema

15**. SETL** (SET Language) is a very high level programming language based on the mathematical theory of sets. SETL provides two basic aggregate data types: unordered sets,
and sequences (the latter also called tuples). The elements of sets and tuples can be of any

arbitrary type, including sets and tuples themselves. Maps are provided as sets of pairs (i.e., tuples of length 2) and can have arbitrary domain and range types. Primitive operations in SETL include set membership, union, intersection, and power set construction, among others.

ETL

Extract, Transform and Load (ETL) is a methodology used to transform unstructured or semi-structured data from its source format into another format that can be loaded into a database or data warehouse. It is most commonly used to extract data from various sources, transform this data in accordance with business rules, and then load it into a destination database. The need for ETL arises from the fact that many organizations have multiple systems containing data in different formats.

The ETL process has 3 main steps, which are Extract, Transform and Load.

Extract – The first step in the ETL process is extracting the data from various sources. Each of the source systems may store its data in completely different format from the rest. The sources are usually flat files or RDBMS, but almost any data storage can be used as a source for an ETL process.

Transform – Once the data has been extracted and converted in the expected format, it's time for the next step in the ETL process, which is transforming the data according to set of business rules. The data transformation may include various operations including but not limited to filtering, sorting, aggregating, joining data, cleaning data, generating calculated data based on existing values, validating data, etc.

Load – The final ETL step involves loading the transformed data into the destination target, which might be a database or data warehouse.