**Assignment 2: OLTP AND OLAP, DATA WAREHOUSING, SQL FEATURES, Relational Database**

**Data Warehousing**

Data Warehouse is a database used for data reporting and analysis. The data stored in the warehouse is uploaded from the operational systems (such as marketing, sales etc.)

Features of Data Warehousing:

* Subject Oriented-Data is subjected to modelling and analysis.
* Integrity-Ensuring consistency in naming conventions, attribute measures, etc. among different data sources.
* Non-Volatile-Once the data entered the data warehouse, it can never be removed.
* Time Variant-Data can be stored for a very large amount of time.

**Data Marts:** Data in data warehouses is stored in the form of data marts. Data Marts are basically the subset of data warehouses that is focused on a specific topic. This allows for more focused and efficient analysis.

**OLTP:** It is a methodology designed to give end users efficient access to extensive datasets. It operates swiftly and intuitively. It's great tasks transaction-oriented applications, mainly focusing on tasks such as data entry and retrieval for transaction processing. An ATM is a great example of OLTP.

Advantages of OLTP:

* Simple and Efficient
* Data integrity
* Faster Query Processing

Disadvantages of OLTP:

* Requires instant update.
* Not suitable for data analytics

**OLAP:** It allows users to interactively analyse multidimensional data from multiple perspectives. OLAP systems are designed to facilitate complex queries and computations involving large volumes of data in a quick and efficient manner.

The core structure in OLAP is the cube, which is a three-dimensional representation of data. Each axis of the cube corresponds to a dimension which enables the users to gain insight into their data in a fast manner. OLAP systems allow users to perform various operations on the cube, such as slicing, dicing and pivoting.

**OLAP Servers:-** There are two main types of OLAP systems:

•**MOLAP (Multidimensional OLAP):** MOLAP systems store data in a multidimensional cube format. Helps the user to “slice and dice” information, providing multi-dimensional analysis of data by putting data in a cube structure.

Most MOLAP products use a multi-cube approach in which a series of small, dense, pre-calculated cubes make a hypercube.

•**ROLAP (Relational OLAP):** ROLAP systems store data in relational databases and dynamically generate multidimensional views.

In two-tier architecture, the user submits a Structured Query Language (SQL)query to the database and receives back the requested data.

**Relational Database (RDBMS)**

It is a type of database management system that organizes data into tables with rows and columns, where each row represents a record, and each column represents a data attribute. It uses SQL for defining and manipulating data which allows user to create, delete, update, or insert new data.

Some examples oof RDBMS are MySQL, PostgreSQL, Oracle Database, Microsoft SQL Server.

**Features of MYSQL Server**:

* It uses only 1MB of RAM on laptop.
* It is written in C and C++ and its parser is written in YACC.
* It is portable.
* It is great for database enabled websites.
* Several websites use MYSOQL for data storage like: YouTube, Wikipedia