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CS313 - LAB 1

Q.1. On Wikipedia, find information about

a) Michael Stonebraker : (specialized in database research.)

Stonebraker started researching relational database systems after papers by Edgar F. Codd on the relational data model. And resulted in Ingres (Interactive Graphics and Retrieval System) was one of the first systems possible to build a practical and efficient implementation of the relational model.

After ingres, Stonebraker with Rowe worked on a new project, named POSTGRES (POST inGRES) designed to add support for complex data types to database systems and improve end-to-end performance of data-intensive applications. After Postgres, Stonebraker initiated the Mariposa. Mariposa built a federated database over an economic model of resource trading, in which data distributed across multiple organizations could be integrated and queried from a single relational interface.

b) Database Application : (database application program)

A database application is a computer program having the purpose of handling information from a computerized database.modern database applications can simultaneously update and queries from multiple users.

By the mid-1980s it was common to give each user a pc with programs connected to a database server. Information would be pulled from the database, transmitted over a network, and then arranged.

Starting in the mid-1990s it became more common to build database applications with a Web interface. A database application with a Web interface had the advantage that it could be used on devices of different sizes, with different hardware, and with different operating systems. Not every program that uses a database would typically be considered a "database application".

Q.2. Find some large database applications that have a huge database size and large number of transactions. Select some Indian applications such as UPI (using which payment apps like Bhim or Google Pay work) or Flipkart

1. UIDAI - HCL Infosystems :
   Handles the world's largest ID database of Aadhaar (data of all 120+ crore Indian residents.) Site

2. NSDL e-Governance Infrastructure Limited
   Handles PanCard DataBase
3. Flexcube :
   Handles databases of indian banks like HDFC and big corporate banks.

4. SUSE :
   This software is used in India's one of the most popular and giant companies BSE (BOMBAY STOCK EXCHANGE). It allows them to carry their all transactions smoothly.

5. Jio

6. IRCTC

7. Aarogya Setu

8. Myntra

Q.3. Find out more about OLTP, OLAP and difference between them

Online transaction processing (OLTP) captures, stores, and processes data from transactions in real time. Online analytical processing (OLAP) uses complex queries to analyze aggregated historical data from OLTP systems. OLTP is operational, while OLAP is informational.

	OLTP	OLAP
Characteristics	Handles a large number of small transactions	Handles large volumes of data with complex queries
Operations	Based on INSERT, UPDATE, DELETE commands	Based on SELECT commands to aggregate data for reporting
Response time	Milliseconds	Seconds, minutes, or hours depending on the amount of data to process
Purpose	Control and run essential business operations in real time	Plan, solve problems, support decisions, discover hidden insights
Data updates	Short, fast updates initiated by user	Data periodically refreshed with scheduled, long-running batch jobs
Space requirements	Generally small if historical data is archived	Generally large due to aggregating large datasets
User examples	online shoppers	data analysts
Database design	Normalized databases for efficiency	Denormalized databases for analysis

Site : https://www.stitchdata.com/resources/oltp-vs-olap

Q.4. Can you find out the possible time required to take up a backup of a bank's database whose size is 25TB ?

For particular SBI : (SBI DATA)

1. SBI uses LTO-8 with 2 Drives and 30 Cartridges Slots
2. LTO-8 offers a compressed storage capacity of 30TB (12TB native) using a 2.5:1 ratio, and a compressed transfer rate of 750 MB/sec. (360MB/sec. native). (site)

So,

25*1000/0.75 = almost 9 hours & 15 minutes