

Training Program on Database Management System (25th May, 2023 to 24th June, 2023)

A Database Management System (DBMS) is basically a software that facilitates the creation, organization, retrieval, and management of data in a structured way. It acts as an interface between the database and users or application programs, ensuring efficient and secure data storage and retrieval. A 30 Days Database Management System was organized for the students from 25th May, 2023 to 24th June, 2023. Dr. Souvik Ganguli from the Department of Electrical and Instrumentation Engineering, Thapar Institute of Engineering and Technology, Patiala was the coordinator of the program. The program link is provided for reference:

<https://www.youtube.com/watch?v=mpXQPEqdemA>

The image displays eight screenshots from a YouTube video series, arranged in a 4x2 grid. Each screenshot shows a video player interface with a dark background and white text. The video content is as follows:

- Top-left:** Day 1 - Database Management Systems (MongoDB & SQL). Title: DATABASE MANAGEMENT SYSTEMS. Content: Database Management System or DBMS in short refers to the technology of storing and retrieving users' data with utmost efficiency along with appropriate security measures.
- Top-right:** Day 1 - Database Management Systems (MongoDB & SQL). Content: Generally, data was organized in file formats. A modern DBMS has the following characteristics:
 - Real - World Entity:** A modern DBMS is more realistic and uses real-world entities to design its architecture.
 - It uses the behavior and attributes too.
 - For example, a school database may use student as an entity and their age as an attribute.
- Second row, left:** Day 1 - Database Management Systems (MongoDB & SQL). Content: Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information.
 - Mostly data represents recordable facts.
 - Data aids in producing information, which is based on facts.
 - For example, if we have data about marks obtained by all students, we can then conclude about toppers and average marks.
- Second row, right:** Day 1 - Database Management Systems (MongoDB & SQL). Title: DBMS - Architecture. Content: In 1-tier architecture, the DBMS is the only entity where the user directly sits on the DBMS and uses it.
 - Any changes done here will directly be done on the DBMS itself.
 - It does not provide handy tools for end-users. Database designers and programmers normally prefer to use single-tier architecture.
- Third row, left:** Day 3 - DBMS (MongoDB & SQL) ER Models. Title: Logical Data Independence. Content: Logical data is data about database, that is, it stores information about how data is managed inside.
 - For example, a table (relation) stored in the database and all its constraints, applied on that relation.
 - Logical data independence is a kind of mechanism, which liberalizes itself from actual data stored on disk.
 - If we do some changes on table format, it should not change the data residing on the disk.
- Third row, right:** Day 3 - DBMS (MongoDB & SQL) ER Models. Title: Physical Data Independence. Content: All the schemas are logical, and the actual data is stored in bit format on the disk.
 - Physical data independence is the power to change the physical data without impacting the schema or logical data.
 - For example, in case we want to change or upgrade the storage system itself - suppose we want to replace hard-disks with SSD - it should not have any impact on the logical data or schemas.
- Bottom row, left:** Day 3 - DBMS (MongoDB & SQL) ER Models. Title: ER Model - Basic Concepts. Content: The ER model defines the conceptual view of a database.
 - It works around real-world entities and the associations among them.
 - At view level, the ER model is considered a good option for designing databases.
- Bottom row, right:** Day 3 - DBMS (MongoDB & SQL) ER Models. Title: Types Of Attributes. Content: Types Of Attributes:
 - Simple attribute -** Simple attributes are atomic values, which cannot be divided further. For example, a student's phone number is an atomic value of 10 digits.
 - Composite attribute -** Composite attributes are made of more than one simple attribute. For example, a student's complete name may have first_name and last_name.