



Introduction
to Database

Dr. Munesh
Singh

Introduction to Database

Dr. Munesh Singh

Indian Institute of Information Technology
Design and Manufacturing,
Kancheepuram
Chennai-600127

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DBMS Syllabus

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Syllabus

Contents of the course	Introduction to Database Systems, Database System Architecture, Schema, Database Models, Relational Model, ER Modelling and case studies. (7) Expressive power of relational databases, Relational Algebra (5) Database Languages, DDL, DML, Structured Query Language (SQL), SQL views, case studies (8) Database Design, Normal Forms (First to third normal form), Boyce codd Normal Form, Database decomposition, Functional Dependencies, Loss-less Join decomposition(8) Transaction Processing and Concurrency control (4) Internal schema Design, Indexing, B-trees, B+ trees (5) Introduction to advanced concepts like Data mining, Data warehousing, XML (5)
Textbook	1. R. Elmasri and S. B. Navathe, "Fundamentals of Database Systems," Pearson, 4 th Edition, 2007.
References	1. A. Silberschatz, H. F. Korth, and S. Sudharsan, "Database System Concepts," Tata McGraw Hill, 5 th Edition, 2006. 2. C. J. Date, A. Kannan, and S. Swamynathan, "An Introduction to Database Systems," Pearson, 8 th Edition, 2006.



DBMS Course Mark Distribution

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Theory

- Quiz 1: 15 Marks
- Quiz 2: 15 Marks
- Discipline: 10 Marks
- Assignment: 10 Marks
- End Exam: 50 Marks

LAB

- Daily Evaluation: 30 Marks
- Project: 20 Marks
- LAB Exam: 30 Marks
- Viva : 20 Marks



What is data in DBMS

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What is Data?

- Data means known facts that can be recorded and that have implicit meaning
- In simple words Data is information



Daily activities uses data

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Data Source

- Banking system
- Library system
- Contact list
- Ledger
- Enquiry System
- Billing System
- Hotel Management
- Hospital Management



Why Software?

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Benefit of Software

- Any software is made to manage data
- Several benefits:
 - Less time
 - Less human resource
 - Accuracy
 - Free from manual error

Data in Programming example

- Add two numbers
- Factorial of a number
- Calculate area
- Calculate simple interest



Conclution

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- Data is any information
- In software system we manage data
- Manage data means storing, processing, and extracting data



Data Persistence

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Data Persistence

- Data persistence means existence of data
- In any program we want to manage data
- Data that is required to manage needs to be stored somewhere until job is not over

Life of data

- Constants in the expressions
- Data stored in variables
- Data stored in secondary storage



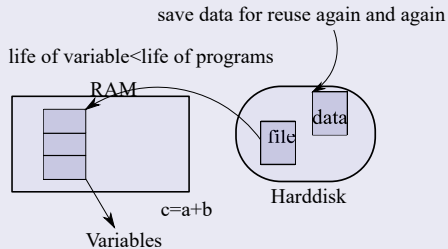
Data Persistence

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An Example

- We need to analyze that for how long we want data to persist in the memory
- Data persistence is life of data
- Sometimes we need data even beyond the life of the program



variable remove once program completes its execution



Data in Secondary Storage

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- Data is sometimes needed to remain available even beyond the life of the program.
- In such case data is stored in secondary storage like hard disk
- When data is stored in the secondary memory it is bound to reside in a file
- File is an operating, which makes separation among bundles of heterogeneous data stored in the storage



What is Database

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- A software application most of the times required to store relevant information in the secondary storage (in the form of files)
- A database is a place where all your application related data is stored
- One application data can be stored in a bunch of files.
- We can say, database is a collection of files



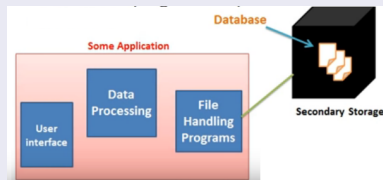
What is DBMS?

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What is file handling?

- Files need to be handled by set of programs
- This bunch of programs is a part of actual application



DBMS

- DBMS is database management system
- It is a collection of programs that enables users to create and maintain a database

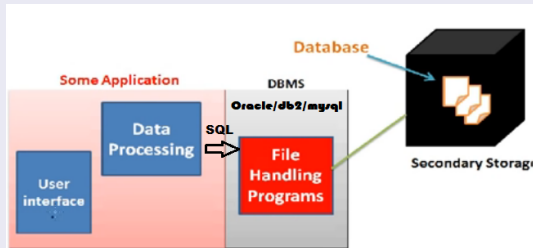


What is DBMS?

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- The DBMS is a general purpose software system that facilitates the process of defining, constructing, manipulating, and sharing databases among various users and applications.





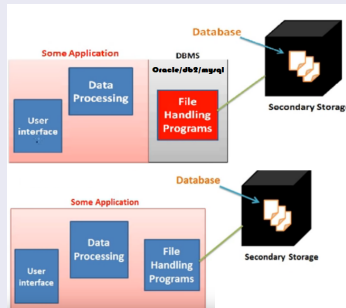
DBMS vs Traditional File Handling in DBMS

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Two ways

- Exhaustive analysis, huge coding and rigorous testing of file handling code is expensive, time consuming and risky
- DBMS is general purpose software which can be used in place of file handling code to perform the same task in the most efficient way possible





DBMS vs File Handling

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- Controlling Redundancy
- Restricting Unauthorized Access
- Efficient Query Processing
- Providing Backup and Recovery
- Multiple user Interface
- Integrity Constraint
- Relationship among data
- Development Time
- Flexibility