

# DATABASE - INTRODUCTION

Presentation by

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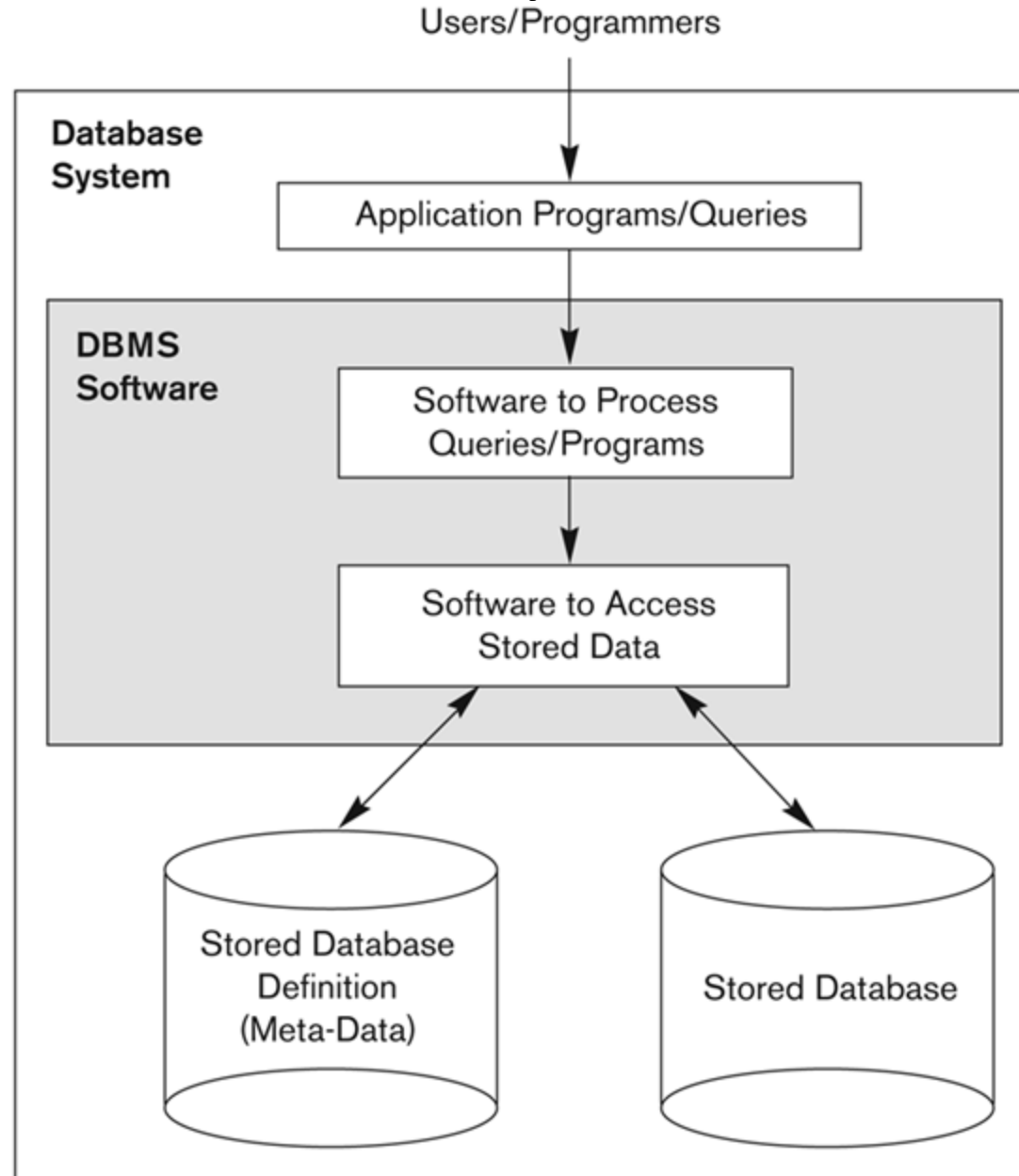
# DEFINITIONS

- **Data:** Known facts that have an implicit meaning.
- **Database:** A collection of inter-related data.
- **Database System:** The DBMS software together with the data itself. Sometimes, the applications are also included.
- **Database Management System (DBMS):** A software package/ set of programs / system to facilitate the creation and maintenance of a computerized database.

# Database System Environment

- Database + DBMS software + Database system

# Simplified database system environment



# Database an Example

- UNIVERSITY database
  - Information concerning students, courses, and grades in a university environment
- **Data records**
  - STUDENT
  - COURSE
  - SECTION
  - GRADE\_REPORT
  - PREREQUISITE

# Example of a simple database

## COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

## SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	04	King
92	CS1310	Fall	04	Anderson
102	CS3320	Spring	05	Knuth
112	MATH2410	Fall	05	Chang
119	CS1310	Fall	05	Anderson
135	CS3380	Fall	05	Stone

## GRADE\_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

## PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

# DBMS- Examples (Relational Model -R)

DBMS	Vendor	Type
Access (Jet, MSDE)	Microsoft	R
Adabas D	Software AG	R
Adaptive Server Anywhere	Sybase	R
Adaptive Server Enterprise	Sybase	R
Advantage Database Server	Extended Systems	R
Datacom	Computer Associates	R
DB2 Everyplace	IBM	R
Filemaker	FileMaker Inc.	R
IDMS	Computer Associates	R
Ingres ii	Computer Associates	R
Interbase	Inprise (Borland)	R
MySQL	Freeware	R
NonStop SQL	Tandem	R
Pervasive.SQL 2000 (Btrieve)	Pervasive Software	R
Pervasive.SQL Workgroup	Pervasive Software	R
Progress	Progress Software	R
Quadbase SQL Server	Quadbase Systems, Inc.	R
R:Base	R:Base Technologies	R
Rdb	Oracle	R
Red Brick	Informix (Red Brick)	R
SQL Server	Microsoft	R
SQLBase	Centura Software	R
SUPRA	Cincom	R
Teradata	NCR	R
YARD-SQL	YARD Software Ltd.	R
TimesTen	TimesTen Performance Software	R

# DBMS Examples (Extended Relational -XR & Object Relational- OR Model)

DBMS	Vendor	Type
Adabas	Software AG	XR
Model 204	Computer Corporation of America	XR
UniData	Informix (Ardent)	XR
UniVerse	Informix (Ardent)	XR
Cache'	InterSystems	OR
<b>Cloudscape</b>	Informix	OR
<b>DB2</b>	IBM	OR
Informix Dynamic Server 2000	Informix	OR
Informix Extended Parallel Server	Informix	OR
Oracle Lite	Oracle	OR
<b>Oracle 11i</b>	Oracle	OR
PointBase Embedded	PointBase	OR
PointBase Mobile	PointBase	OR
PointBase Network Server	PointBase	OR
<b>PostgreSQL</b>	Freeware	OR
<b>UniSQL</b>	Cincom	OR



# DBMS Examples (Object Oriented -OO & Relational Network- RN Hierarchical –H Model)

DBMS	Vendor	Type
Jasmine ii	Computer Associates	OO
Object Store	Exceleron	OO
Objectivity DB	Objectivity	OO
POET Object Server Suite	Poet Software	OO
Versant	Versant Corporation	OO
Raima Database Manager	Centura Software	RN
Velocis	Centura Software	RN
Db.linux	Centura Software	RNH
Db.star	Centura Software	RNH
IMS DB	IBM	H

# TYPES OF DATABASES

- Numeric and Textual Databases
- Multimedia Databases
  - store pictures, video clips, and sound messages
- Geographic Information Systems (GIS)
  - store and analyze maps, weather data, and satellite images
- Data Warehouses and OnLine Analytical Processing (OLAP)
  - used in many companies to extract and analyze useful information from very large databases for decision making
- Real-time and Active Databases
  - used in controlling industrial and manufacturing processes

# DBMS - Advantages

- ***Efficient*** - Able to handle large data sets and complex queries without searching all files and data items.
- ***Convenient*** - Easy to write queries to retrieve data.
- ***Safe*** - Protects data from system failures and hackers.
- ***Massive*** - Database sizes in gigabytes and terabytes.
- ***Persistent*** - Data exists after program execution completes.
- ***Shared*** - More than one user can access and update data at the same time while preserving consistency.
- ***Interrelated*** – True of relational DBMS.

# DATABASE APPLICATIONS

- Enterprise Information
- Banking and Finance
- Universities
- Airlines
- Telecommunications

# Thank You!