
بسم الله الرحمن الرحيم

In the Name of

Allah

The Most Merciful and Compassionate the most gracious and beneficent, Whose help and guidance we always solicit at every step, at every moment.

Database System Concepts

Chapter No 01 Introduction

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Thanks to
Shabir Ahmad
Usmany Sir

Data

- The term **data** referred to facts about objects and events that could be recorded and stored on computer media
- **For example**
- In a salesperson's database the data would include facts such as customer name, address and telephone number. This type of data is called structured data.
- The salesperson database might include photo image of the customer contact. It might also include the sound recording or video clip about the most recent product. This type of data is referred to as unstructured data or as multimedia data.

Data

- Structured data?
- Unstructured data or as multimedia data?

Information

- Data that have been processed in such a way as to increase the knowledge of the person who uses the data.

- **For Example.**
  - Consider the following facts:

Ahmad Ali	12589
Shafiq Khan	36985
Saleem Khan	41563
Ashraf	74125
Rashid	45689
Khalid	78541

  - These facts satisfy our definition of Data, but data are useless in its present form.

Information (cont..)

- By adding few additional data items and providing some structure, we recognize a class BS 5th semester for a particular course. Now this is some useful information to some users like course instructor or Examination Department.

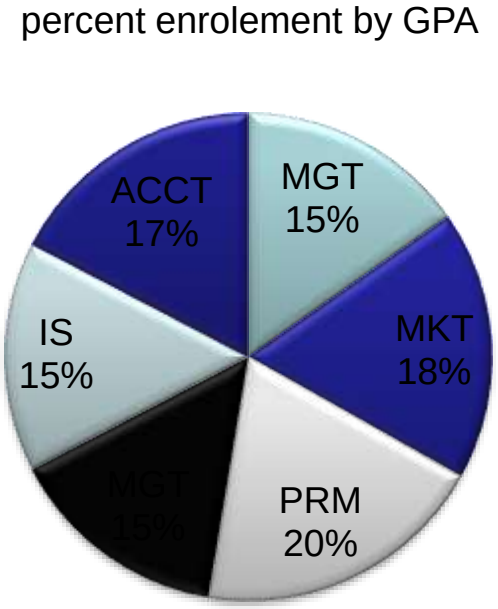
Class BS 5th Semester

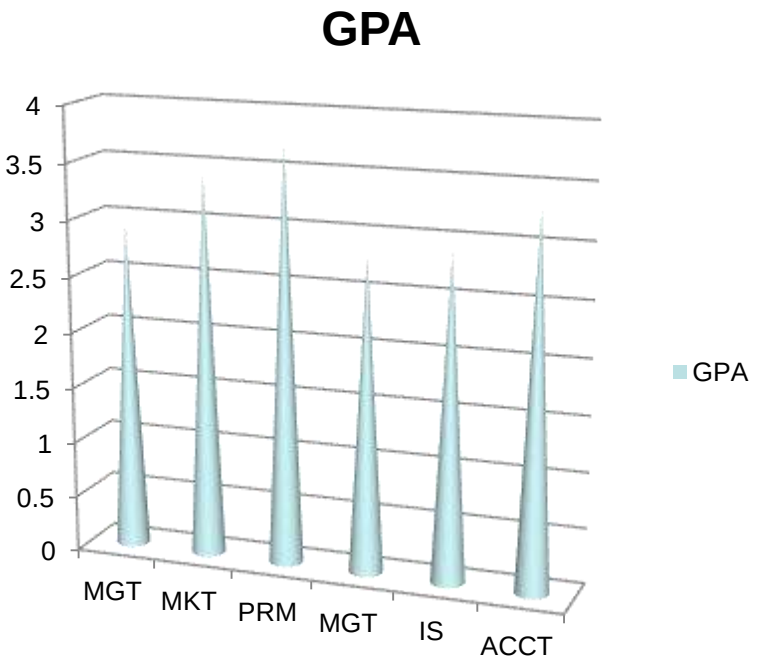
Semester: Fall 2010 Section: B

Name	Id	Major	GPA
Ahmad Ali	12589	MGT	2.9
Shafiq Khan	36985	MKT	3.4
Saleem Khan	41563	PRM	3.7
Ashraf	74125	MGT	2.8
Rashid	45689	IS	2.9
Khalid	78541	ACCT	3.3

Information (cont..)

- Another way to convert the data into information is to summarize it or otherwise process and present it for human interpretation.





Data VS Information

DATA	INFORMATION
Always in Raw form	Always in Arranged Form
Can't used directly for decision making	Can be used for decision making directly
No Information system in data collection and arrangement	Information system i.e Computer system is involved in this process
Input of Computer System	Output of Computer System

Levels of Data

- Real World Data
- Meta Data
- Existence of Data

Real World Data

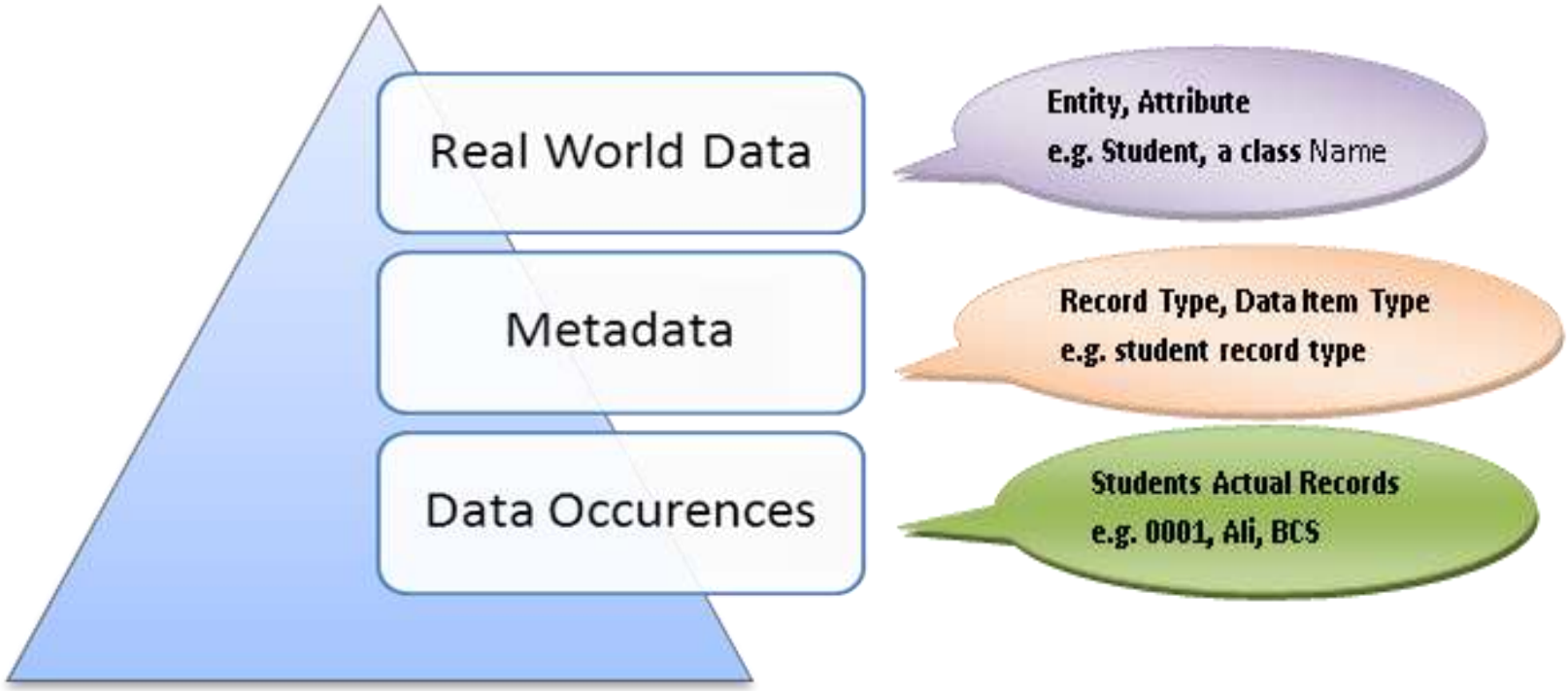
- The real world level of data means that level of data at which entities or objects exist in reality
- It means that any object existing in reality have a name and other identifiable attributes through which we can identify that specific object or entity.
- **Example**
- Any Student

Metadata

- Data that describes the properties or characteristics of end-user data and the context of that data.
- Some of the properties of the data are data names, definitions, length or size, and allowable values.

Data Items		Values			
Name	Type	Length	Min	Max	Source
Course	Alphanumeric	30			Academic Unit
Section	Integer	1	1	9	Academic Unit
Semester	Alphanumeric	10			Exam Unit
Name	Alphanumeric	30			Student
Id	Integer	9			Student
Major	Alphanumeric	4			Student
GPA	Decimal	3	0.0	4.0	Academic Unit

Levels of Data



What is Database?

- **Definition 1**
- A shared collection of logically related data, designed to meet the information needs of multiple users in an organization.

- **Definition 2**
- A collection of information organized and presented to serve a specific purpose. (A telephone book is a common database.) A computerized database is an updated, organized file of machine readable information that is rapidly searched and retrieved by computer

Difference between Database and Database Management System

- The database is the collection of data about anything, could be anything.
- Like cricket teams, students, busses, movies, personalities, buildings, furniture, lab equipment, hotels, countries, and many more anything about which you want to store data.
- What we mean by data; simply the facts or figures. Following table shows the things and the data that we may want to store about them

What is Database?

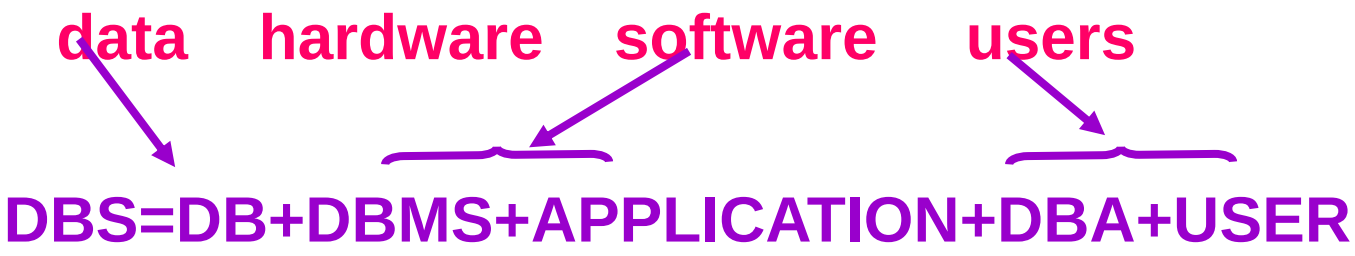
Things	Data (Facts or figures)
Cricket Player	Country, name, date of birth, specialty, matches played, runs etc.
Scholars	Name, data of birth, age, country, field, books published etc.
Movies	Name, director, language etc.
Food	Name, ingredients, taste, preferred time, origin, etc.
Vehicle	Registration number, make, owner, type, price, etc.

Database Management System?

- A database system is basically a computerized record-keeping system; i.e.,it is a computerized system whose overall purpose is to **store information** and to allow users to **retrieve** and **update** that information on demand.

Components of Database Management System?

- **A database system involves four major components:**



1.Data

As We discussed that Data is facts and figures required to be stored in database.

The data in the database will be both integrated and shared.

1.Data

- **By integrated:** we mean that the database can be thought of as ***a unification of several distinct files***, with any **redundancy** among those files eliminated.

- **By shared:** we mean that ***individual pieces of data in the database can be shared among different users***, in the sense that each of those users can have access to the same piece of data, **possibly for different purpose**.

2.Hardware

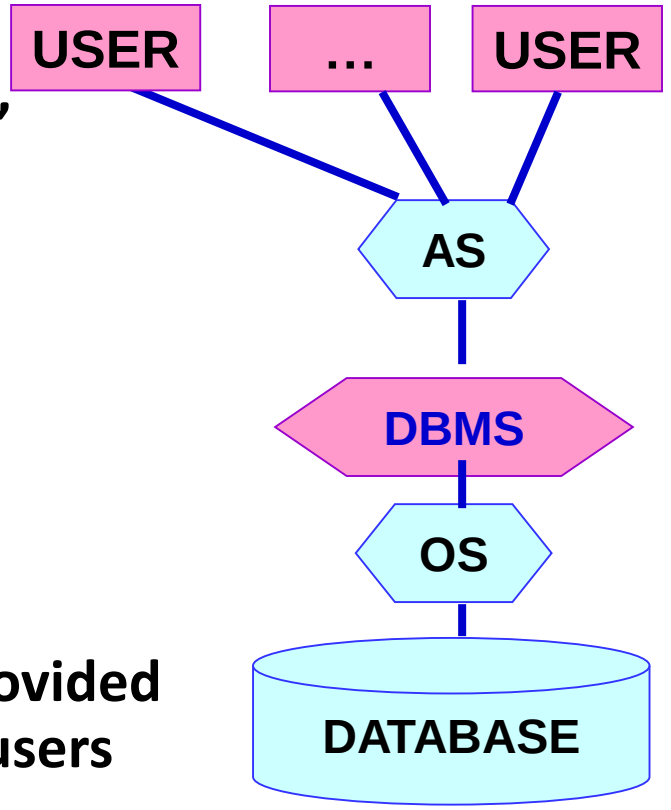
- The hardware components of the system consist of:

1. The secondary storage volumes, device controllers, I/o channels, and so forth; and

2. The hardware processor(s) and associated main memory

3.Software

- Between the *physical database* itself—i.e., the data as physically stored—and the *users of the system* is a layer of software, know variously as the database manger or database server or, most commonly, the database management system(DBMS).



- All requests for access to the database are handled by the DBMS. One general function provided by the DBMS is thus the shielding of database users from hardware—level details.

4.Users

① **Application programmers:** responsible *writing database application programs* in some programming language.

② **End users:** end users interact with the system from online workstations or terminals.

③ **Database administrator(DBA):**

Schema definition storage

Structure and access-method definition

Schema and physical-organization modification

Granting of authorization for data access

Routine maintenance

The Range of Database Applications

- Although there is some overlap, we divide database applications into five categories:
- Personal databases
- Workgroup databases,
- Departmental/Divisional databases,
- Enterprise databases
- Web-enabled databases.

1. Personal Databases

- Designed to support one user.
- resides on personal computers (PCs), including laptops.
- Simple database applications that store customer information and the details of contacts with each customer can be used from a PC or a PDA and easily transferred from one device to the other for backup and work purposes

2. Workgroup Databases

- A workgroup is a relatively small team of people who collaborate on the same project or application or on a group of similar projects or applications.
- A workgroup typically comprises fewer than twenty-five persons. These persons might be engaged (for example) with a construction project or with developing a new computer application.
- A workgroup database is designed to support the collaborative efforts of such a team.

3.Departmental/Divisional Databases (cont...)

- A department is a functional unit within an organization.
- Typical examples of departments are personnel, marketing, manufacturing, and accounting.
- A department is generally larger than a workgroup (typically between 25 and 100 persons) and is responsible for a more diverse range of functions.
- Divisions are even larger administrative units
- Departmental and divisional databases are designed to support the various functions and activities of a department or division

4. Enterprise Databases

- An enterprise database is one whose scope is the entire organization or enterprise (or, at least, many different departments).
- Such databases are intended to support organization wide operations and decision making.
- Over the last decade, the evolution of enterprise databases has resulted in two major developments:
- **1. Enterprise resource planning (ERP) systems**
- **2. Data warehousing implementations**

5. Web-Enabled Databases

- Those databases that can be accessed any where via internet through web browsers are called web enabled databases.
- For example, Online Registration of Kardan Students, Online shopping, internet banking etc

Thanks

Questions?