



Subject: “Database Management Systems 1”

Prerequisite: Programming languages

Number of credits: 3 (2/1/0)

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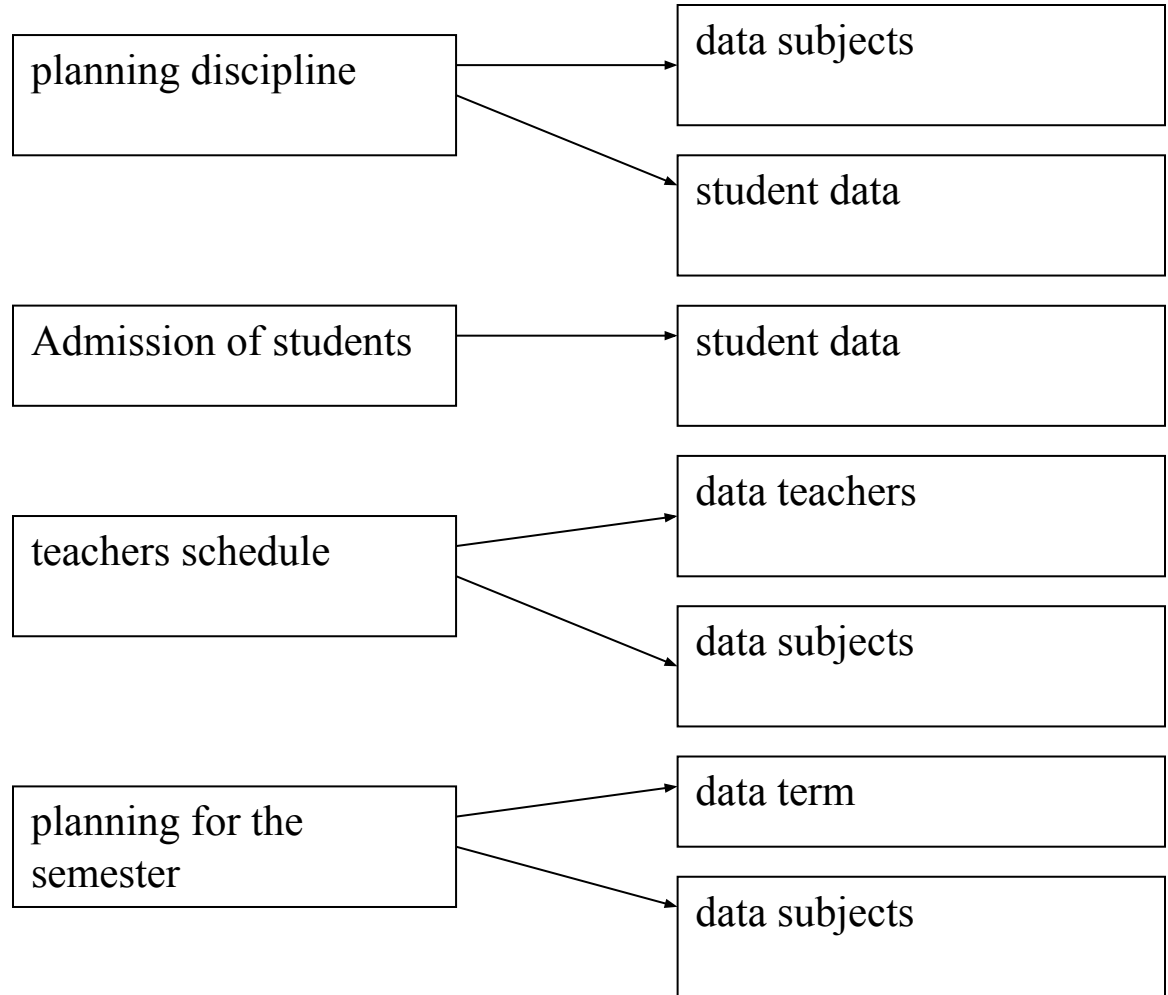
Lecture 1

- Data Administrator
- Database Administrator
- Database designer
 - Database Design Process
- The architecture of a database management systems

Why necessary to use a database management system?

The traditional approach to data processing has the following drawbacks:

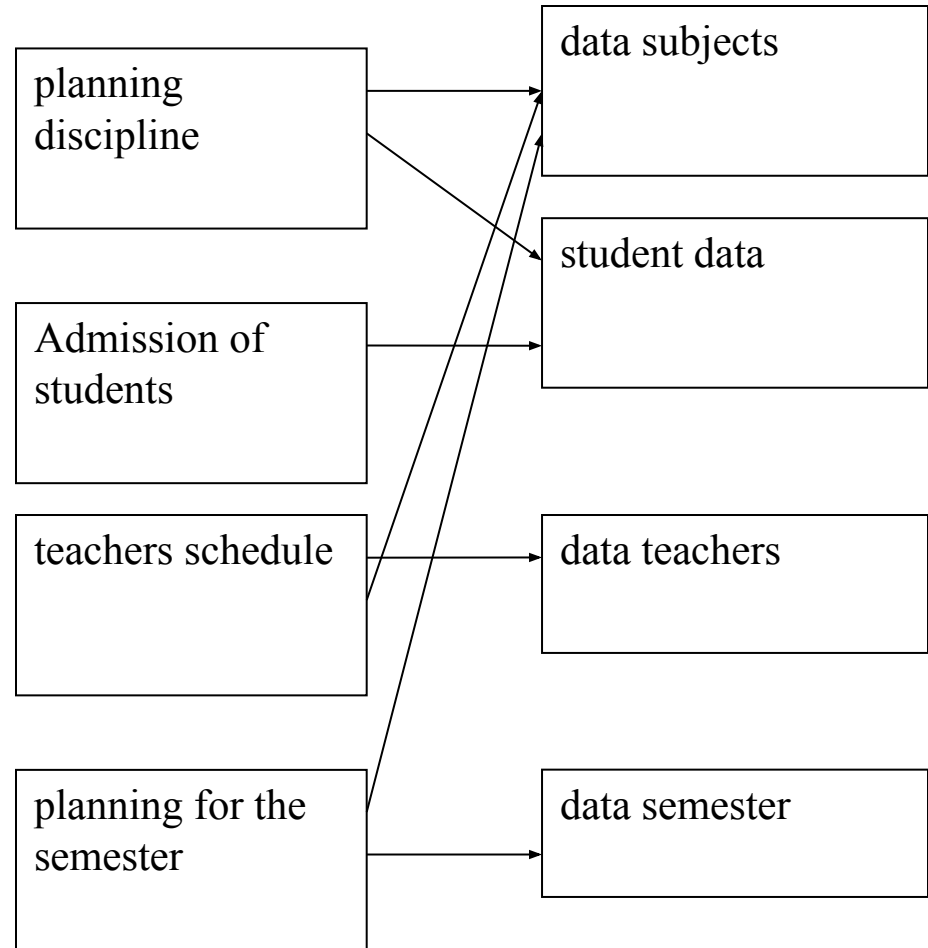
- Duplication of data
- The inconsistency of data.



Link between the application and data files.

Approach using a database management system

- Advantages of the approach **using a database management system**:
 - it reduces redundancy;
 - eliminates the inconsistency;
 - sharing of data;
 - comply with the standards;
 - introduce security measures;
 - supports data integrity.



1. Discuss the several major function of data administrator and database administrator.

Data Administration:

A high-level function that is responsible for

- the overall management of data resources in an organization, including maintaining corporate-wide definitions and standards

Database Administration:

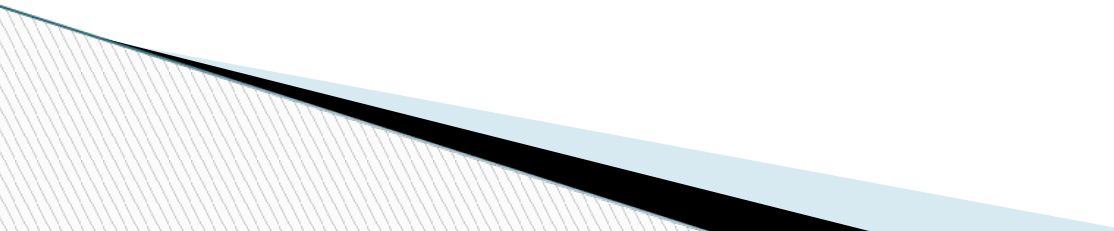
A technical function that is responsible for

- logical and physical database design and for dealing with technical issues such as security enforcement, database performance, and backup and recovery

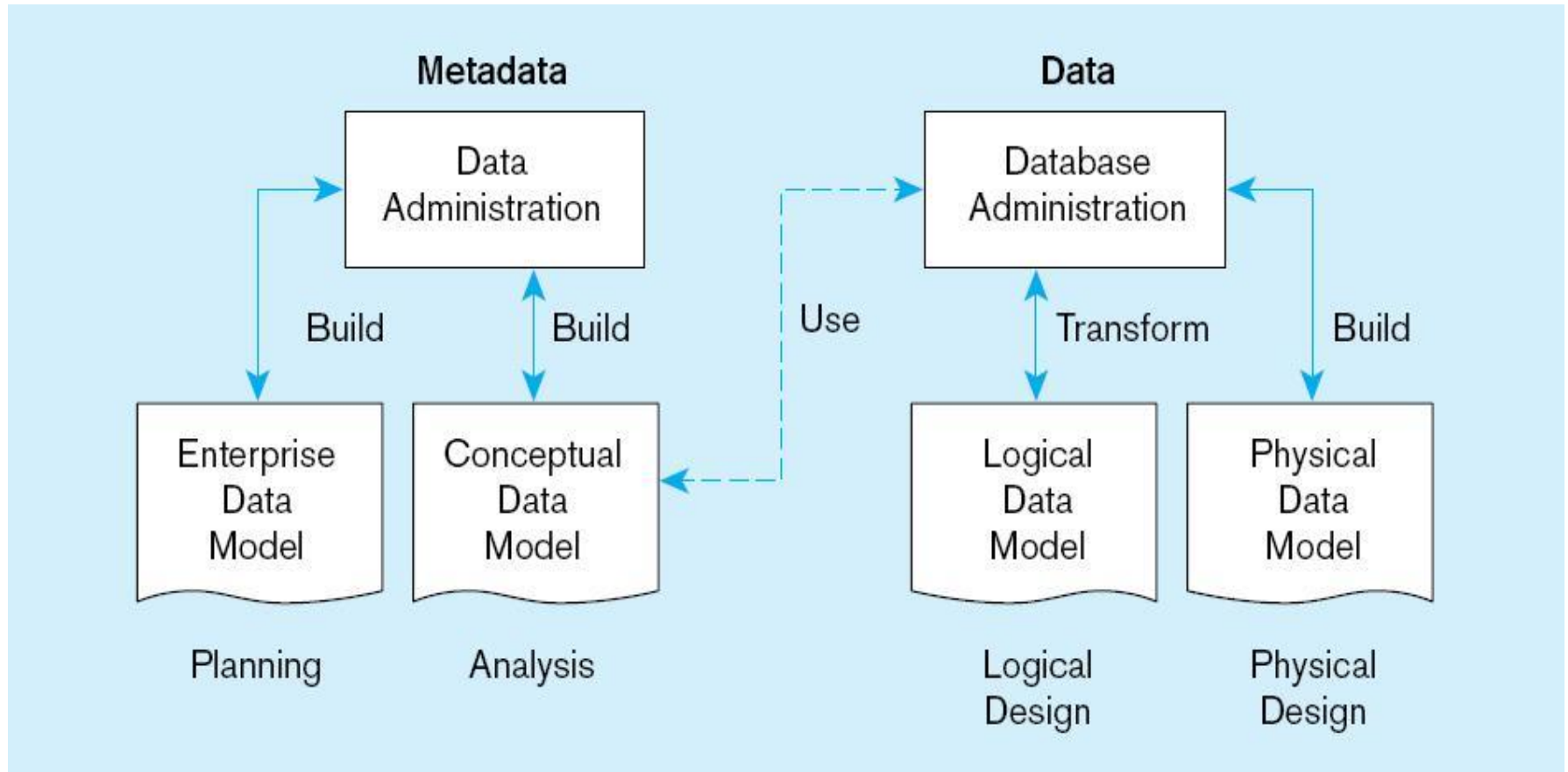
Data Administrator is responsible for :

- Specification of organization data.
- The design and maintenance of data management application.
- Validating the data and files.
- Security of files or databases.

Database Administrator is responsible for :

- reviewing the contents in the database
 - designing, implementing the database
 - to backed up data regularly
 - prevent from unauthorized access.
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Data modeling responsibilities



2. What is the difference between database administrator and database designer?

The designer will learn from the applications designers

- the data types,
- quantities,
- relationships,
- and desired operations (searches, sorts, updates, etc.)
- work with the developers to design a structure/schema

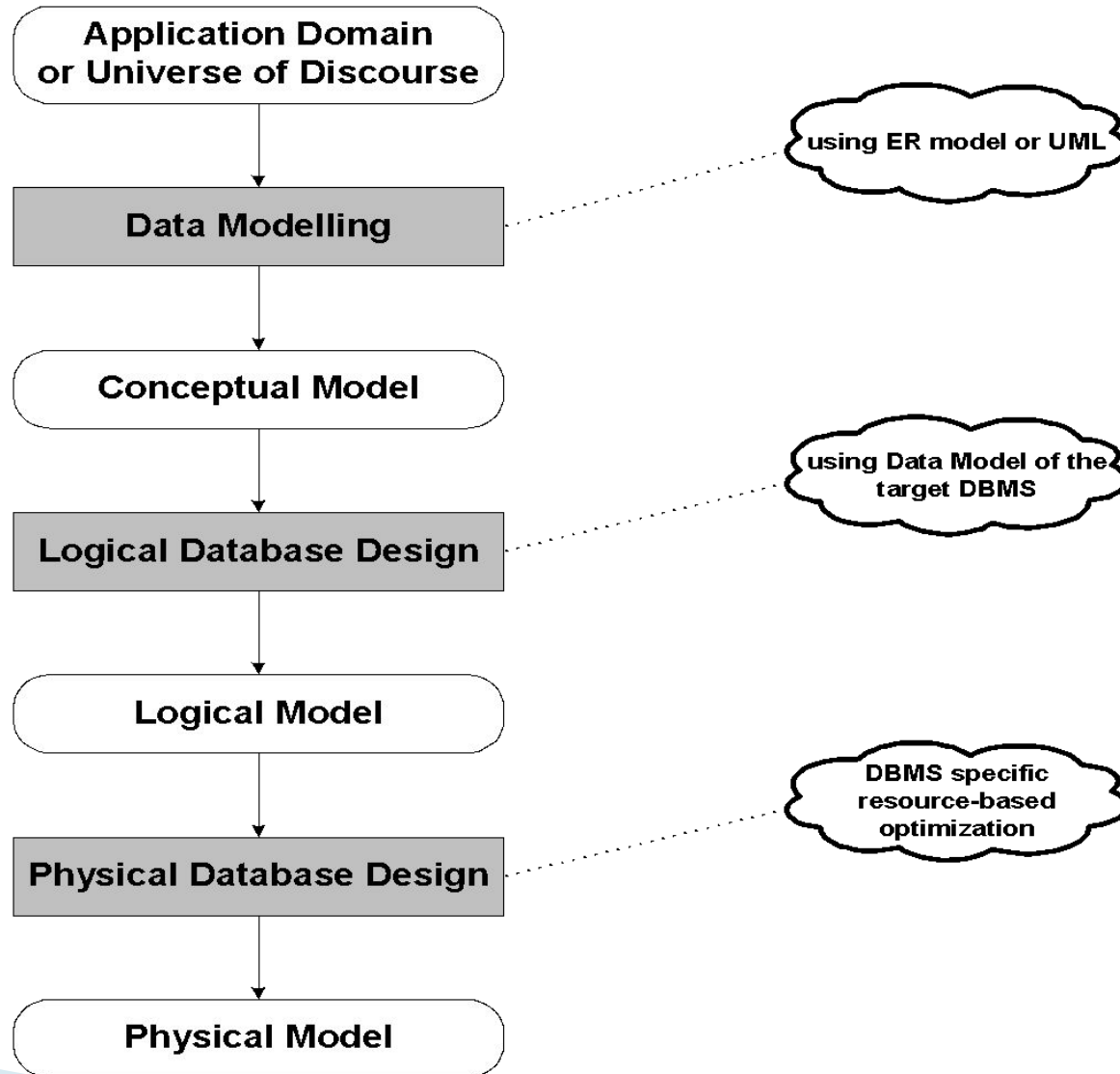
Database designer considering matters such as

- unique keys, primary and foreign keys,
- data types, counters, naming, table relationships, search and sort elements,
- database normalization, search and sort efficiency, and data integrity.

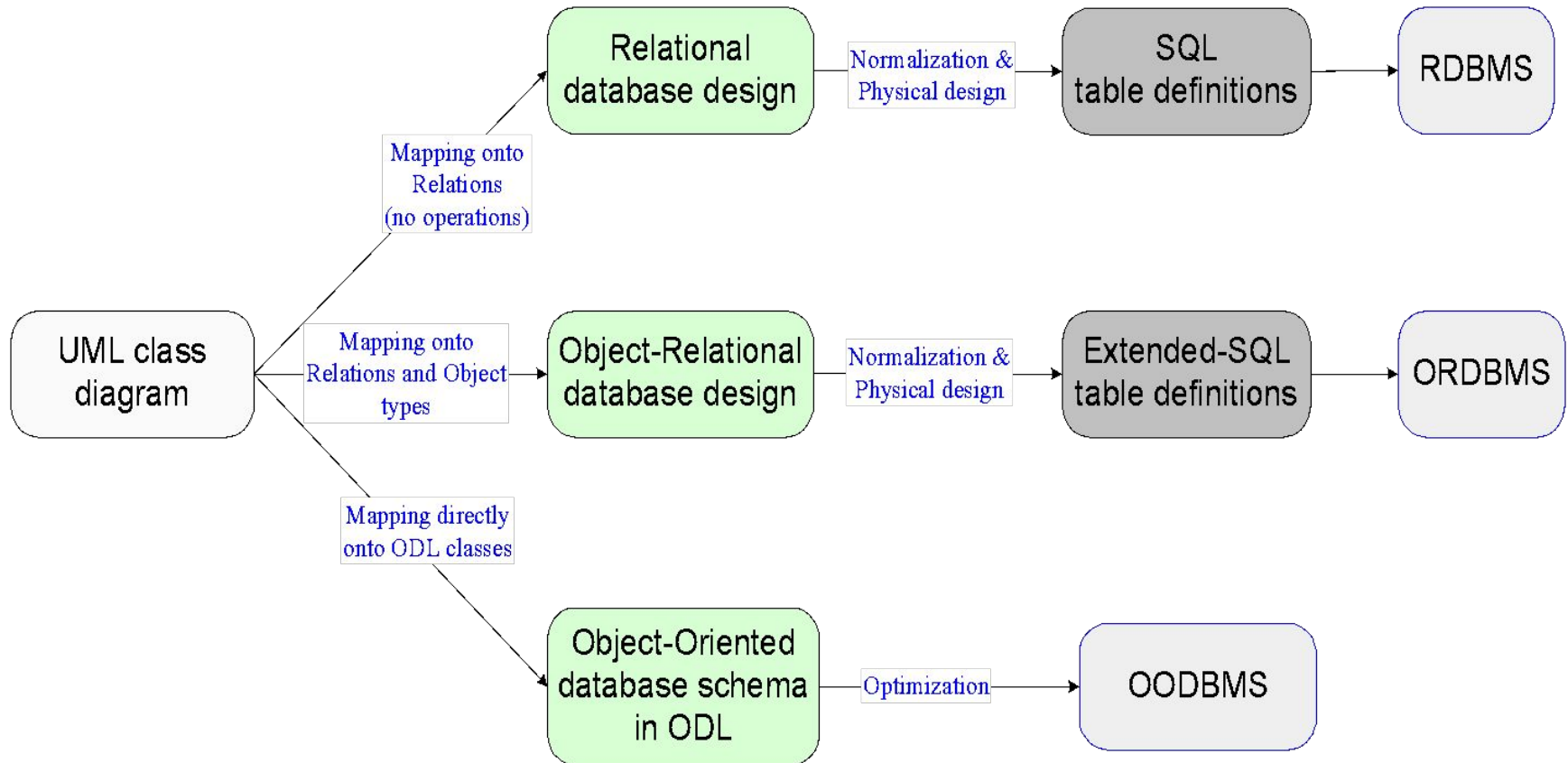
Design and development of database

- Development and implementation of a database in the organization must be performed in sequence.
 - **Preliminary design**
 - **Analysis of feasibility**
 - **Determine requirements**
 - **Conceptual design**
 - **Implementation**
 - select DBMS and get it,
 - convert the detailed conceptual model in a real model DBMS
 - create a data dictionary,
 - populate the database,
 - develop application programs and to train users.
 - **Testing and maintenance of the database.**

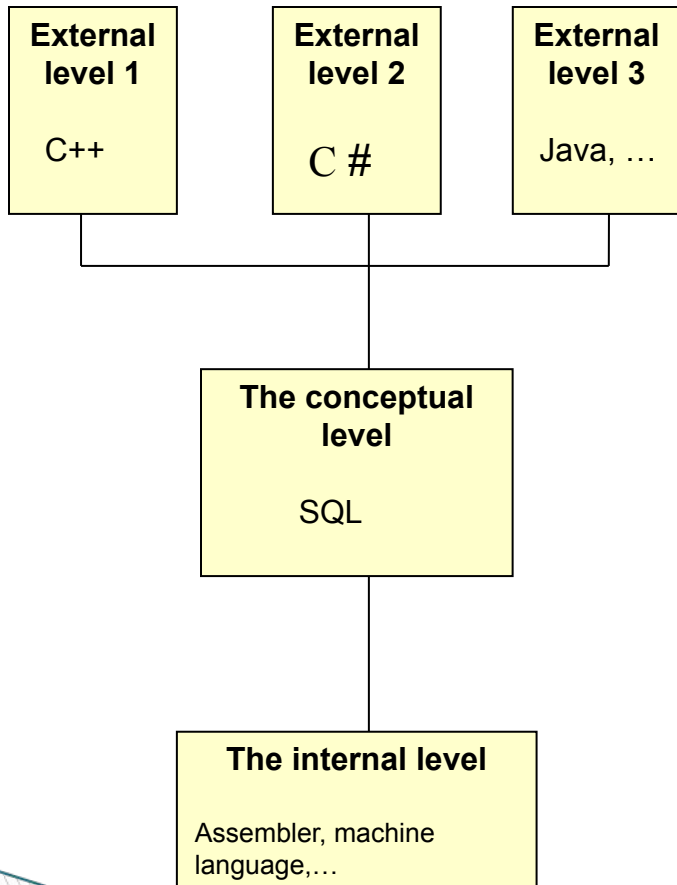
Database Design Process



Logical/Physical database design



Architecture of a database management system



The architecture of a database management system can be divided into three levels:

- The external level: This presentation describes only part of actually existing database.
- The conceptual level: conceptual level represents the entire database as a whole, and is used by the database administrator.
- The internal level: at this level there is a physical data storage, and it is the lowest level in the architecture.

Examples of levels of database architecture

The external level:

```
cout << "Emp#" << EMPLOYEE_CODE;  
cout << "Dept#" << DEPARTMENT_CODE;  
cout << "Salary" << SALARY;
```

The conceptual level:

```
EMPLOYEE  
EMPLOYEE_CODE CHARACTER 6  
DEPARTMENT_CODE CHARACTER 4  
SALARY NUMERIC 5
```

The internal level:

```
STORED EMPLOYEE LENGTH=18  
PREFIX TYPE=BYTE(6), OFFSET=0  
EMP# TYPE=BYTE(4), OFFSET=6, INDEX EMPX  
DEPT# TYPE=BYTE(4), OFFSET=12  
SALARY=BYTE(4), OFFSET=16
```

review

- Why need to use a database management system?
 - The major function of data administrator and database administrator.
 - What is the difference between database administrator and database designer?
 - Database Design Process
 - The architecture of a database management system
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