



# Management Information Systems

## **DATABASE (1)**

### **CONCEPT**

**M. Rasti-Barzoki**

**Website: [rasti.iut.ac.ir](http://rasti.iut.ac.ir)**

**91-2**



### مشکلات محیط فایل‌های سنتی

- افزونگی داده (Data Redundancy)
- وابستگی داده به برنامه (Program-Data Dependence)
- عدم انعطاف (Lack of Flexibility)
- ضعف امنیت (Poor Security)
- عدم به اشتراک گذاری و دسترسی به داده (Lack of Data-Sharing and Availability)

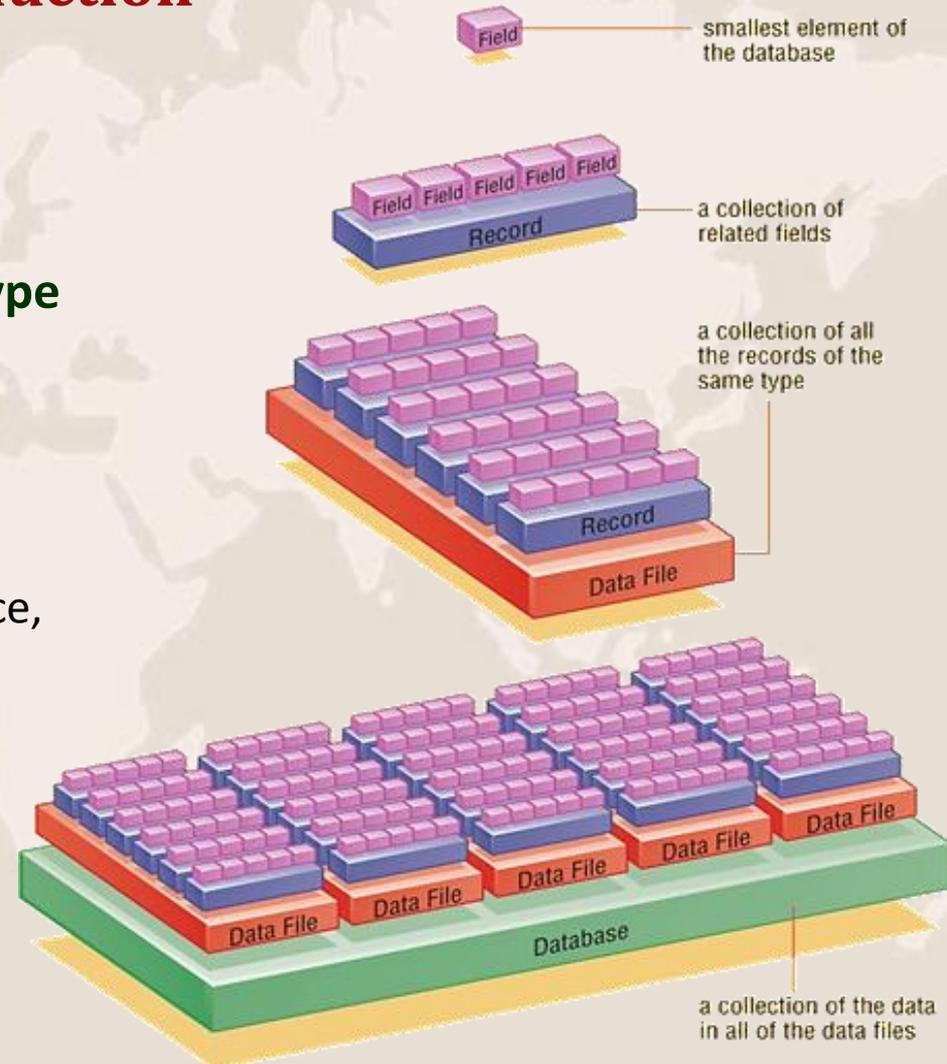


# Management Information Systems

## Database

### Introduction

- File organization concepts
  - Database: Group of related files
  - File: Group of records of same type
  - Record: Group of related fields
  - Field: Group of characters as word(s) or number
    - Describes an **entity** (person, place, thing on which we store information)



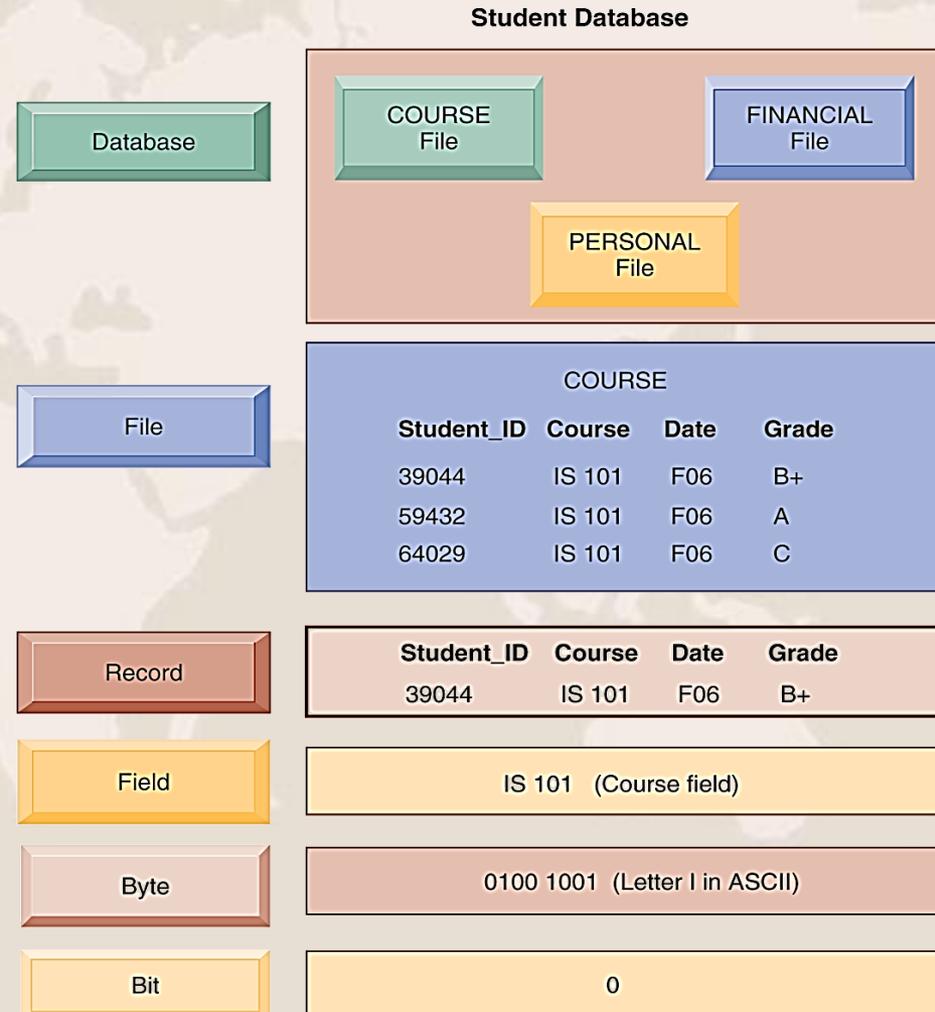


# Management Information Systems

## Database

### Introduction

- A computer system organizes data in a hierarchy that starts with the bit, which represents either a 0 or a 1.
- Bits can be grouped to form a byte to represent one character, number, or symbol.
- Bytes can be grouped to form a field, and related fields can be grouped to form a record.
- Related records can be collected to form a file, and related files can be organized into a database.





### Database management system

- Software that allows a user to create and manage a computerized database is called **database management system (DBMS) software**.
- DBMS software also allows a user to create reports from stored data.



### The Database Approach to Data Management

- **Database**
  - **Serves many applications by centralizing data and controlling redundant data**
- **Database management system (DBMS)**
  - **Interfaces between applications and physical data files**
  - **Solves problems of traditional file environment**
    - Controls redundancy
    - Eliminates inconsistency
    - Enables organization to centrally manage data and data security



### The Database Approach to Data Management

- **Database**
  - **Serves many applications by centralizing data and controlling redundant data**
- **Database management system (DBMS)**
  - **Interfaces between applications and physical data files**
  - **Solves problems of traditional file environment**
    - Controls redundancy
    - Eliminates inconsistency
    - Enables organization to centrally manage data and data security



### The Database Approach to Data Management

- **Relational DBMS**
  - Represent data as two-dimensional tables called relations or files
  - Each table contains data on entity and attributes
- **Table: grid of columns and rows**
  - Rows (tuples): Records for different entities
  - Fields (columns): Represents attribute for entity
  - Key field: Field used to uniquely identify each record
  - Primary key: Field in table used for key fields
  - Foreign key: Primary key used in second table as look-up field to identify records from original table



# Management Information Systems

## Database

### RELATIONAL DATABASE TABLES

**SUPPLIER**

Columns (Attributes, Fields)

Supplier_Number	Supplier_Name	Supplier_Street	Supplier_City	Supplier_State	Supplier_Zip
8259	CBM Inc.	74 5 <sup>th</sup> Avenue	Dayton	OH	45220
8261	B. R. Molds	1277 Gandolly Street	Cleveland	OH	49345
8263	Jackson Composites	8233 Micklin Street	Lexington	KY	56723
8444	Bryant Corporation	4315 Mill Drive	Rochester	NY	11344

Key Field (Primary Key)

Rows (Records, Tuples)



# Management Information Systems

## Database

### RELATIONAL DATABASE TABLES (cont.)

**PART**

Part_Number	Part_Name	Unit_Price	Supplier_Number
137	Door latch	22.00	8259
145	Side mirror	12.00	8444
150	Door molding	6.00	8263
152	Door lock	31.00	8259
155	Compressor	54.00	8261
178	Door handle	10.00	8259

Primary Key

Foreign Key



### The Database Approach to Data Management

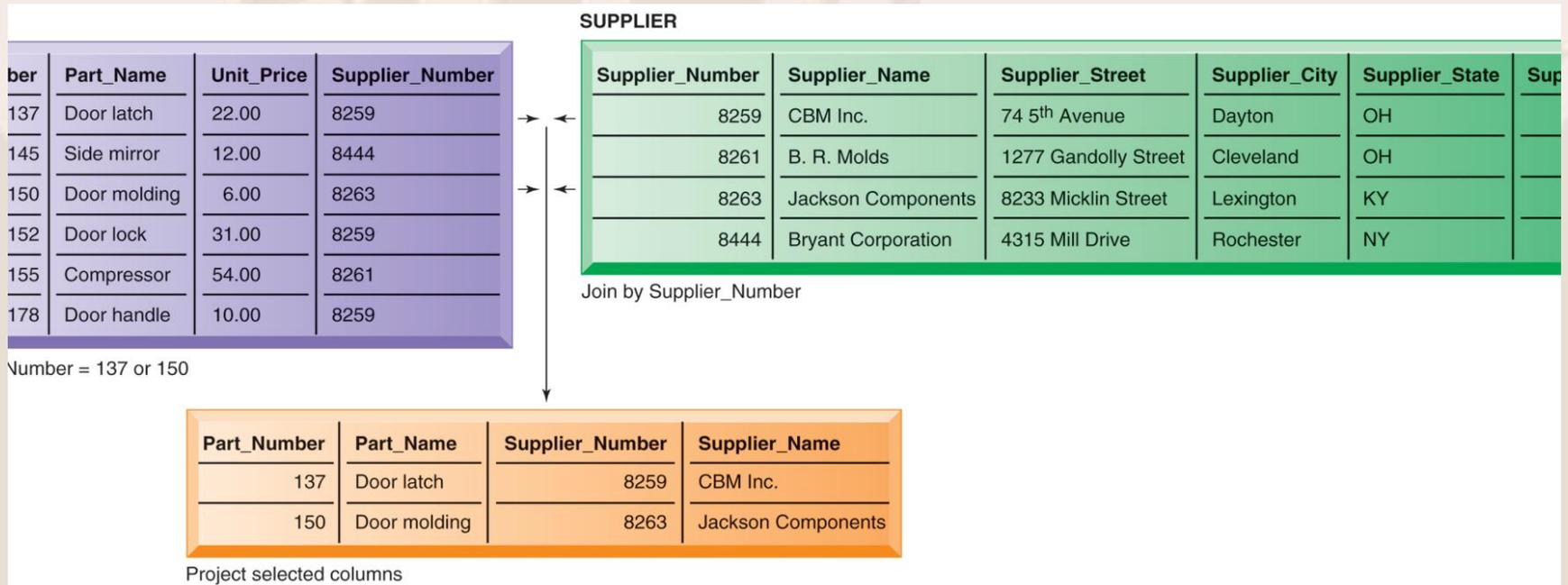
- **Operations of a Relational DBMS**
  - **Three basic operations used to develop useful sets of data**
    - SELECT: Creates subset of data of all records that meet stated criteria
    - JOIN: Combines relational tables to provide user with more information than available in individual tables
    - PROJECT: Creates subset of columns in table, creating tables with only the information specified



# Management Information Systems

## Database

### THE THREE BASIC OPERATIONS OF A RELATIONAL DBMS



The select, join, and project operations enable data from two different tables to be combined and only selected attributes to be displayed.



# Management Information Systems

## Database

سفارش

شماره سفارش	تاریخ سفارش	تاریخ تحویل	شماره قطعه	تعداد سفارش
1634	02/02/04	02/22/04	152	2
1635	02/12/04	02/28/04	137	3
1636	02/13/04	03/01/04	145	1

قطعه

شماره قطعه	شرح قطعه	قیمت واحد	شماره تأمین کننده
137	قفل درب	22.50	4058
145	دستگیره درب	26.25	2038
150	درزگیر درب	6.00	4058
152	کمپرسور	70.00	1125

تأمین کننده

نام تأمین کننده	نام تأمین کننده	آدرس تأمین کننده
4058	شرکت CBM	
2038	شرکت Ace	
1125	شرکت Bryant	

انتخاب شماره قطعه = 137 یا 152

ادغام از طریق شماره تأمین کننده

شماره قطعه	شماره تأمین کننده	نام تأمین کننده	آدرس تأمین کننده
137	4058	شرکت CBM	
152	1125	شرکت Bryan	

ستونهای انتخاب پروژه



# Management Information Systems

## Database

### مدل داده رابطه ای

ستونها (ویژگی ها، فیلدها)

جدول روابط

شماره سفارش	تاریخ سفارش	تاریخ تحویل	شماره قطعه	تعداد سفارش
1634	02/02/04	02/22/04	152	2
1635	02/12/04	02/28/04	137	3
1636	02/13/04	03/01/04	145	1

ردیفها (رکوردها)

شماره قطعه	شرح قطعه	قیمت واحد	شماره تأمین کننده
137	قفل درب	22.50	4058
145	دستگیره درب	26.25	2038
150	درزگیر درب	6.00	4058
152	کمپرسور	70.00	1125

شماره تأمین کننده	نام تأمین کننده	آدرس تأمین کننده
4058	شرکت CBM	
2038	شرکت Ace	
1125	شرکت Bryant	



### مدل مفهومی و فیزیکی

#### • طراحی پایگاه داده

– طراحی مفهومی یا منطقی (Conceptual or Logical Design):  
مدل خلاصه شده ای است از پایگاه داده از زاویه دید کسب  
و کار.

– طراحی فیزیکی (Physical Design): مدلی که نشان می دهد  
پایگاه داده چگونه بر روی تجهیزات ذخیره سازی، سازماندهی  
شده است.



پایان

