

N

Date: \_\_\_\_\_  
 No. \_\_\_\_\_  
 \* **Session 2**  
 Database کی بنیاد پر

by File based system

① delimited File - آؤ - آؤیجی data

(2) Fixed width File Space : " " " "  
space in between, only Fixed width attributes  
Problems digit

① to can search  $\rightarrow$  linear search  
↳ Waste Time

(2) backup (Manual)

③ not synchronized (not data sharing)

④ not Permissions

⑤ not constraints on rules

⑥ No Security.

⑦ Relationship not geted & have repeated data (Duplication)

⑧ no Standardization

کے ساتھ ساتھ <sup>نفس</sup> نفسی حاجت کو گناہ والی بات سے بچانے کے لیے

9) البيانات : كود لها أن تتعامل مع File وحيث  
تحتفظ بال data structure وحيث أن  
البيانات هي data  
(معلومات) بتوثيق البيانات

Date:

Name as string not ahmed

Meta data

data

Access authorization

Data Base can depend on Meta Data not Data

recovery backup versions Minimal redundancy

redundancy

### DB Disadvan

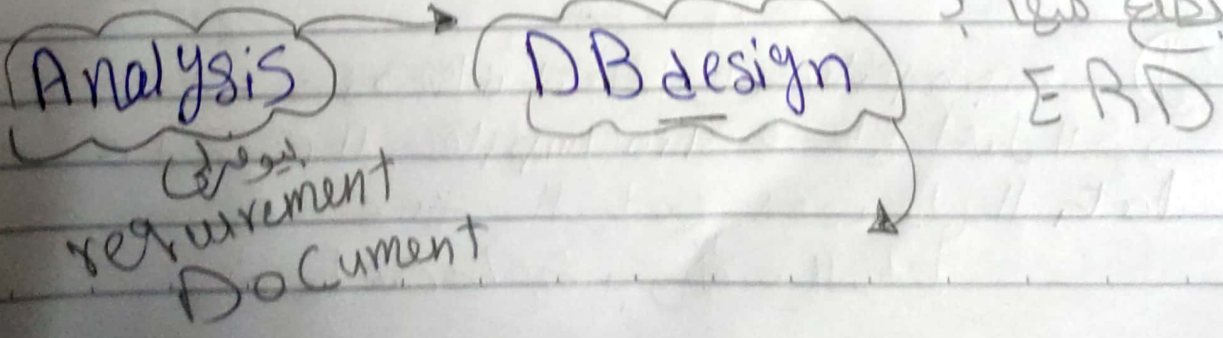
1. It can be expensive

DBMS (Data Base Management System)

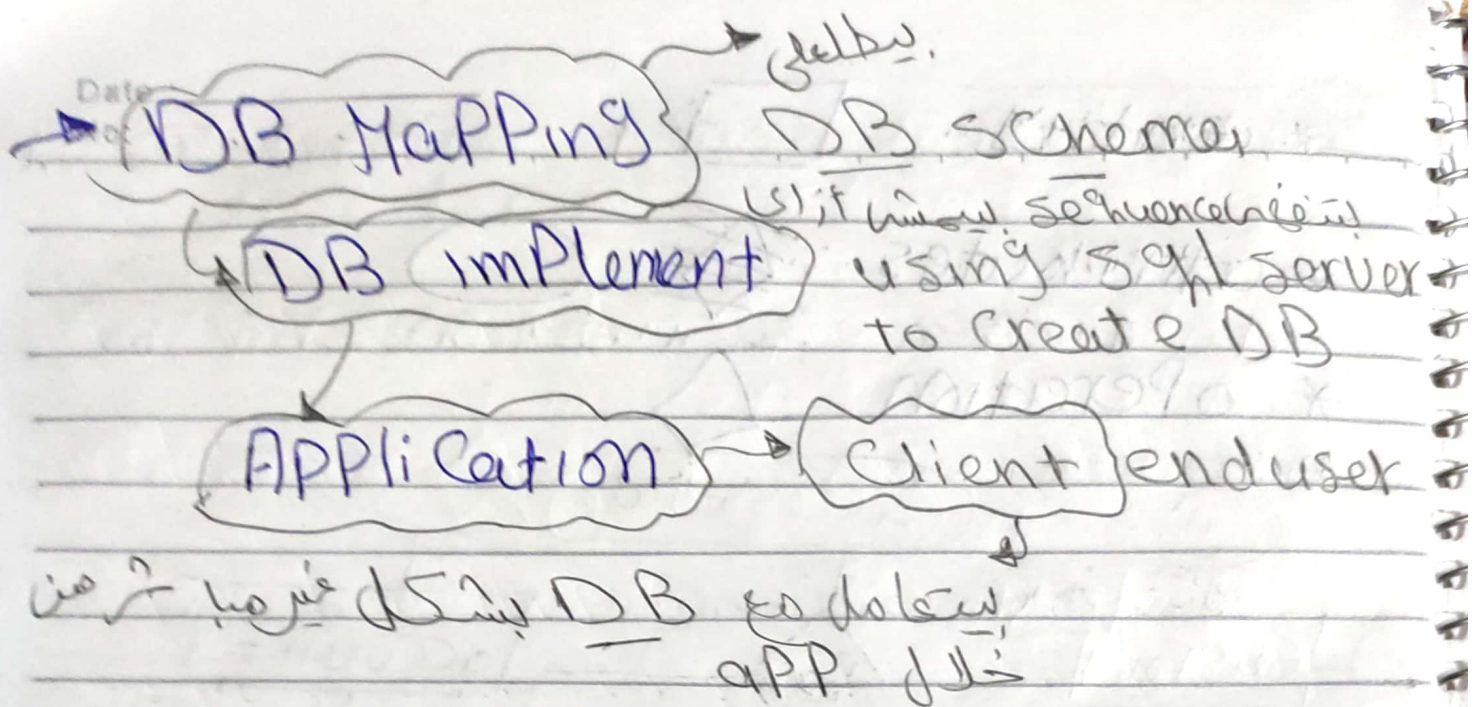
Itself is expensive

DBMS may in compatible

### DB life cycle







## \* DataBase users:

- ① DB Administrator: مسؤول عن إدارة و Secure data
- ② System Analysis
- ③ DB Designer
- ④ DB Developer
- ⑤ APP Programmer
- ⑥ BI & Big Data Specialist (Data Scientist): أكثر تخصص في تحليل و إدارة البيانات و اتخاذ قرارات بناءً على البيانات و أخذها

## Entity Relationship Diagram (ERD)

- ① entities: Person, Place, object, concept, real time object (is distinguishable)
- ② attributes: entity's property or characteristics
- ③ Relationships: link between entities (Primary Key, Foreign Key)



Date :

No :

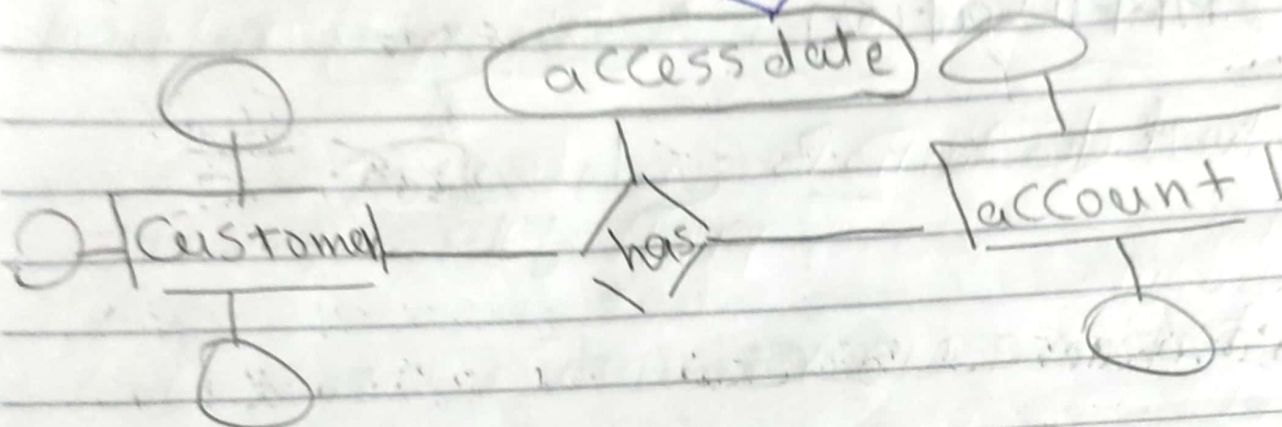
entity



\* attributes



\* operation



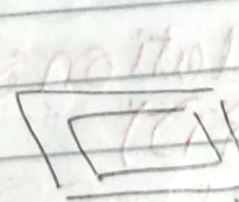
→ access date operation  
relation || Customer has account  
Customer has access date

\* Strong entity Weak entity

has Primary Key

Strong entity  
It has Partial Key

→ Weak entity



→ Operation between (Strong) and Weak





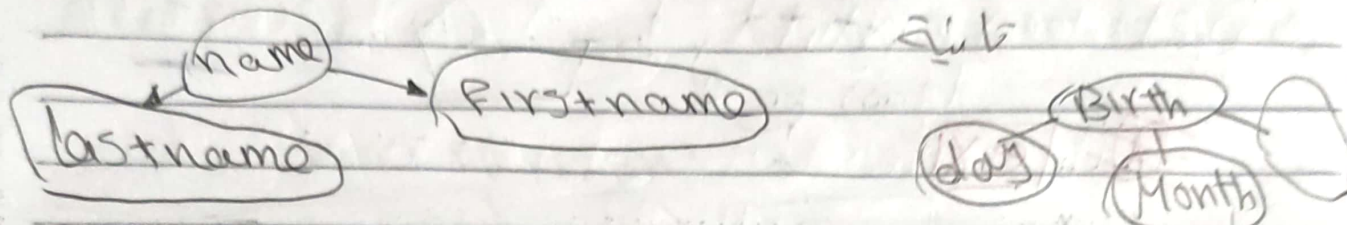
Date : \_\_\_\_\_

No: \_\_\_\_\_

# Types of Attributes

① Simple Attribute

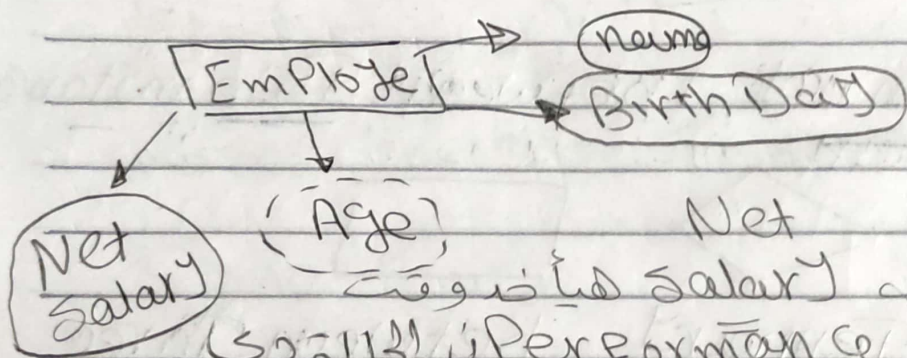
② Composite // attribute is composed of attributes



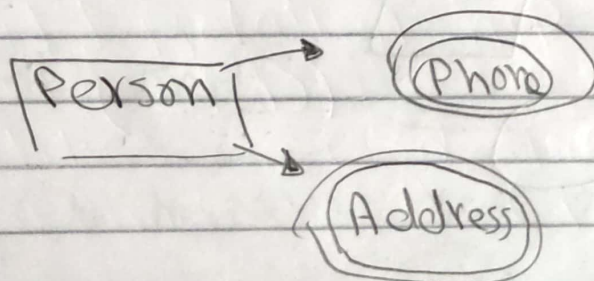
③ Derived // (dashed ellipse)

derived attributes are calculated from other attributes

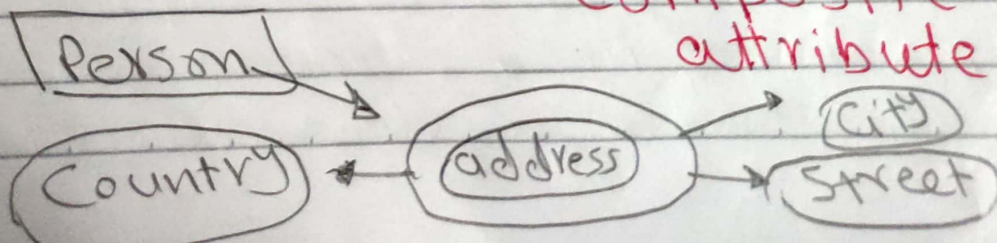
Age is derived from Birthday  
 Net salary is derived from salary



④ Multi valued Attribute



⑤ Complex (Multi valued + Composite attribute)





Date : \_\_\_\_\_

No: \_\_\_\_\_

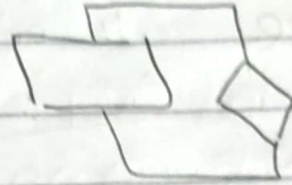
# \* Relation ship

is a association several

→ Relation ship

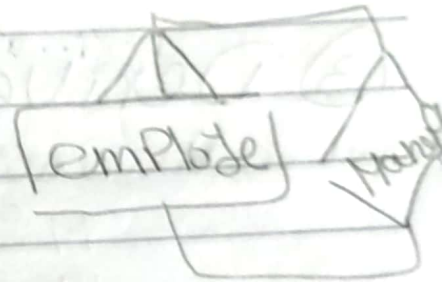
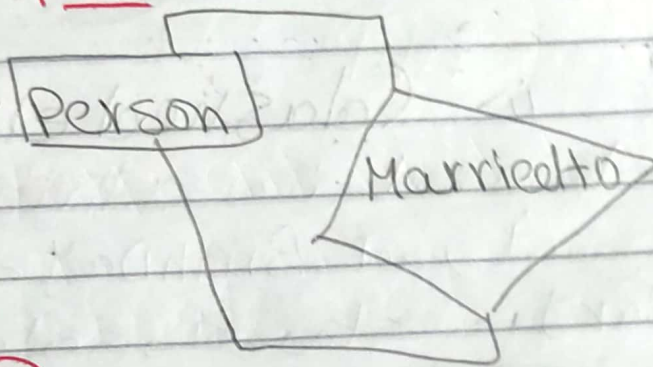
## ① Degree of Relation ship

① ↳ Unary  
between entity,  
↳ to 1



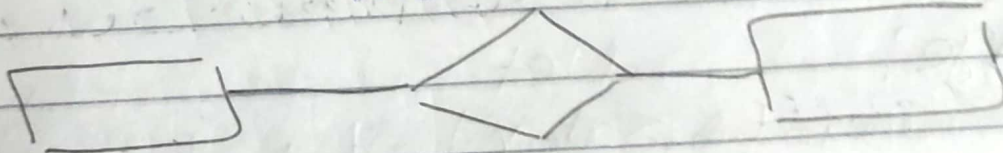
Recursive

~~②~~ Text



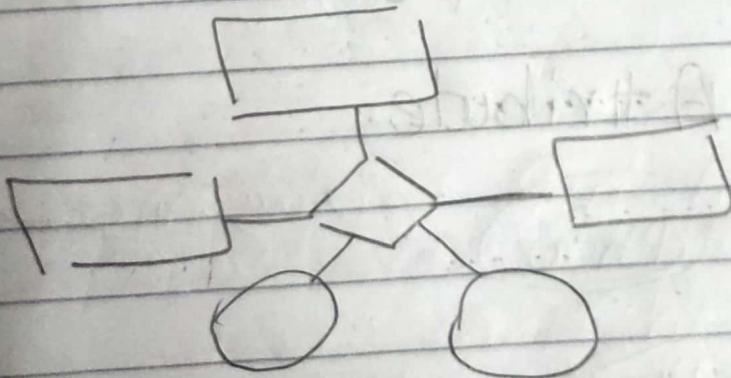
②

↳ Binary between Two instance



③

↳ Ternary between Three entities



~~④~~

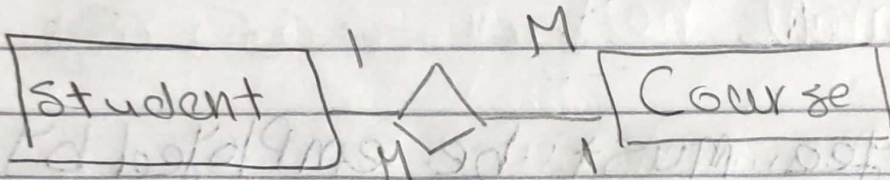
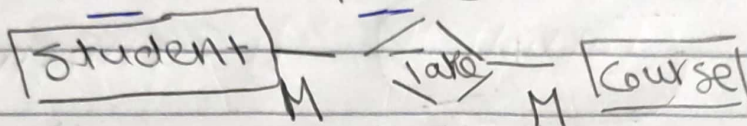


## ② \* Cardinality

↳ one to one [employ] — [own] — [car]

↳ one to Many [Depart] — [has] — [employed]

↳ Many to Many



→ one Student Take Many Course

→ one Course " " Student

## ③ \* Participation Constraint

Total Mandatory Must

Partial optional May

\* IF you have weak entity → Mandatory  
 entity Mandatory  
 فلازم يكونوا متواجدين

Zero or more → optional

one or more → Mandatory

Date : \_\_\_\_\_

No. : \_\_\_\_\_

→ An employee must work for department  
Mandatory (Total Participation)

→ only one some employees manage department

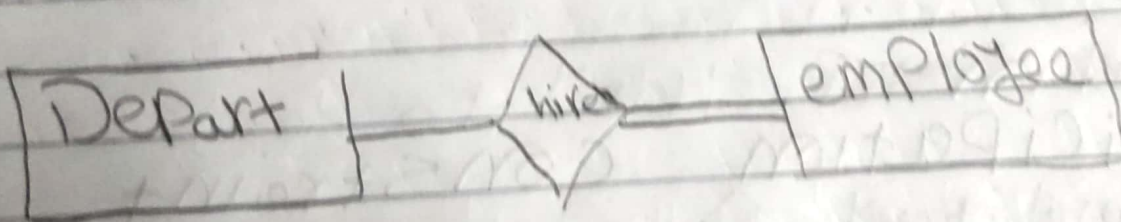
as Manager one may ← employee

Optional (Partial Participation)

Ex 1

① Department may hire many employees  
(Zero or more)   
(Optional)

② employee must be employed by Department  
Mandatory





Date :

No:

# \* Keys

## ① Candidate Key

Primary Key هو Key يرفع او يحتل يكون

## ② Primary Key (unique + not null)

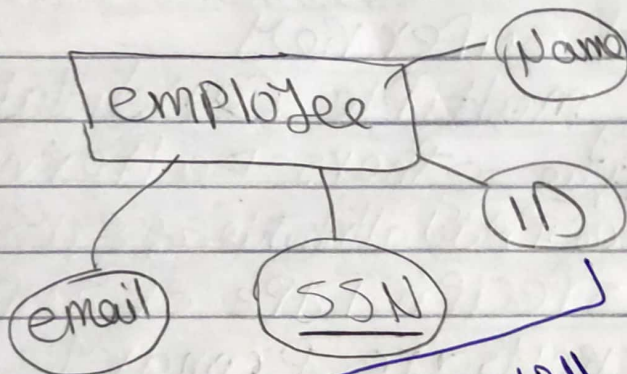
Primary → Key attribute

## ③ Foreign Key link between Tables

reference → between Tables

May be null

~~④~~



SSN Primary

الصلة بينه وبين Primary

وارد بتغير email  
ليس بتغير  
أقنع ليس بتغير

ليس بتغير  
أقنع

\* reference Table Primary Key  
ف Table كاني انا relation  
Foreign Key



Date :

No: ③ Composite Key Content More one Key  
Primary Key W اجزاء For line Key

④ Partial Key → in weak entity

Acco

Partial Key / discriminator

Self Study

⑤ Alternate Key

- Key That not selected as Primary Key
- it's Minimal super Key
- IF you has multiple Candidate Key one → Primary others → alternate

⑥ Super Key unique هو عبارة عن مجموعة من attributes

→ Primary Key SPECIFIC TYPE OF Super Key  
but not all Super Keys are Primary

- You Can have Multiple Super Key For table
- IS (one or more) attributes unique Identifier

⑦

Ex! IF you have Table attributes  
Employee ID, SSN, Email

Three can uniquely identify an employee So → Three are Super Key

\* IF you ChooSen ID to Primary  
= email, SSN IS alternate Key



Date : \_\_\_\_\_

No: \_\_\_\_\_

example: \_\_\_\_\_

locations = \_\_\_\_\_

ee. MultiValues

different between Candidate Key,  
Super Key?

same example Table attributes

$\{SSN, email, ID\}$

$SSN, email, ID$  consider candidate  
super but diff in Minimal sets

① Candidate Key  $\rightarrow \{ID, SSN, email\}$

② Super Key  $\rightarrow \{ID, SSN, email\}$  or  
 $\{ID, SSN\}$ ,  $\{ID, email\}$ ,  
 $\{SSN, email\}$ ,  $\{ID\}$ ,  $\{SSN\}$ ,  $\{email\}$

also  $\rightarrow$  Super Key may include  
extra attributes that not necessary  
unique identifier.