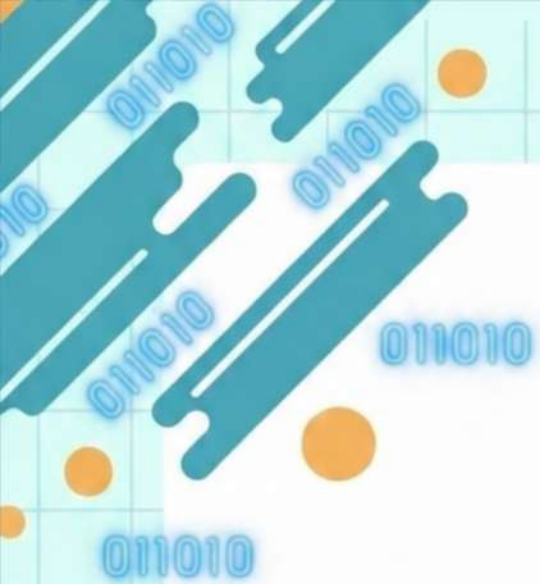
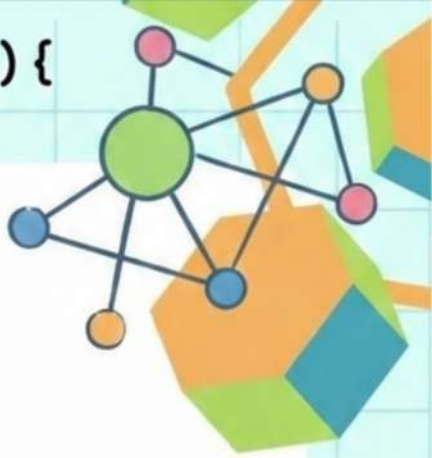
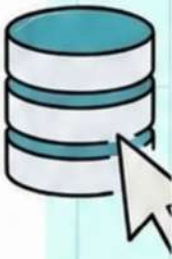
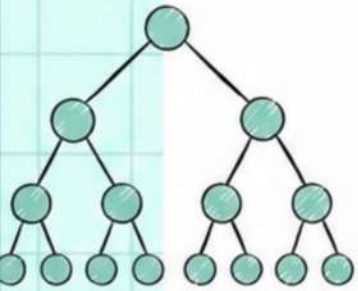
```
function computeSum(a, b) {
   return a + b;
}
```





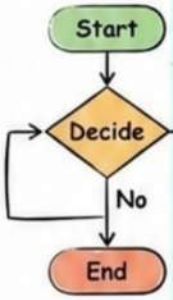




Dr. Hozifa Alqady

41098980

** CS 371 **

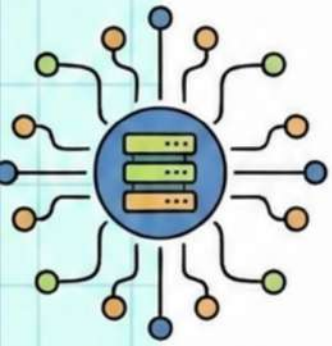




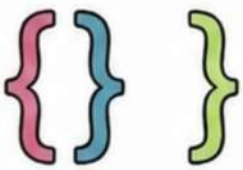
Proce







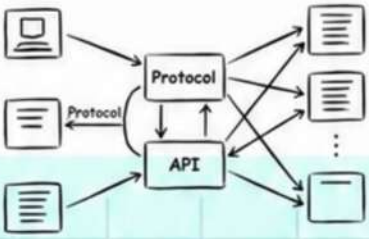














Lec 1

Database

Hotel, Bank, Airlines, مكان اقدر اخزن فيها بيانات

Library, Shopping online, Supermarket



زمان

Computer

- Hardware: يمكن لمسه — mouse, keyboard
- Software: لا يمكن لمسه — applications: word, excel

البيانات بيتم حفظها على الـ Computer في ملفات وكل ملف له امتداد (extension) واللي بيقدر احدد من خلاله نوع الملف

مثال hozaifa.jpg ← الامتداد هو jpg يبقى ده ملف لصوره

مثال ali_cv.docx ← الامتداد هو docx يبقى ده ملف word

وعشان افتح الملف ده الـ Computer يروح يستدعي برنامج الـ word

ويعطيه الملف ← بعدها الملف يفتح واقدر اقرا اللي داخله

Simple Databases (Traditional Databases)

student

ID	Name	Age	address	GPG
1	Hozaifa	22	Hawalli	3.2

Numerical + Textual data

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Social media reels, video, Comments

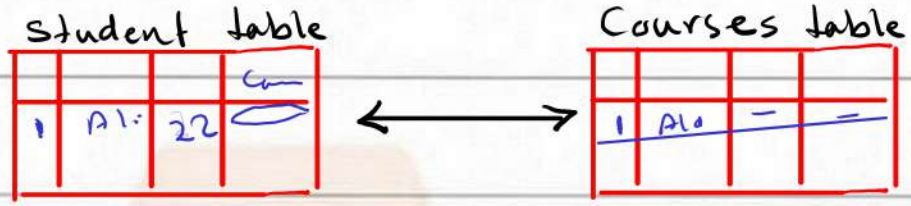
Big data , Nosql

Data base types :-

① Relational database

* مجموعه من الجداول وفى علاقات ما بين الجداول

مثال الجامعه فيها Students & Courses



يستخدمها لما يبقى البيانات structured

SQL : Structured Query Language

MYSQL & ORACL ⇐ مثال

② Nosql database

* يتحتفظ بالبيانات فى documents

* يستخدمها لو البيانات عندى Not structured

مثال Mongo DB

Database : Collection of related data that has a meaning

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QUENS

Types of data انواع البيانات

1. Numerical data → Student age
2. Textual data → Student name
3. Multimedia data → Student image

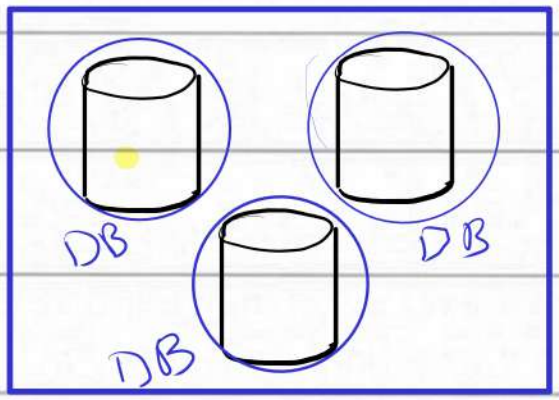
Database Size

Database	Size	Complexity
Library	Small	Numerical + textual data
Facebook	big	Numerical + textual + Multimedia

DBMS : Database management system

Software

1. Create database
2. manipulate database (insert data, update)



3. Administring
   - users permissions
   - Back up
4. Excute query
   Search

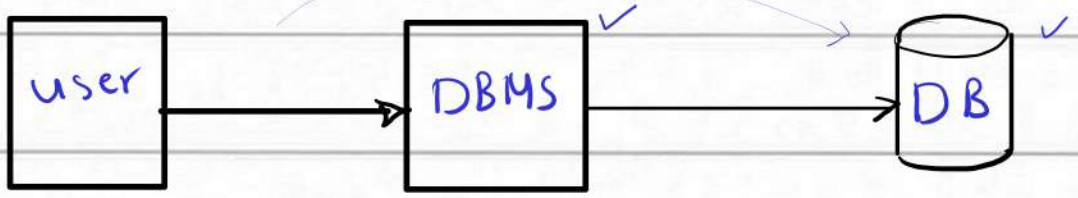
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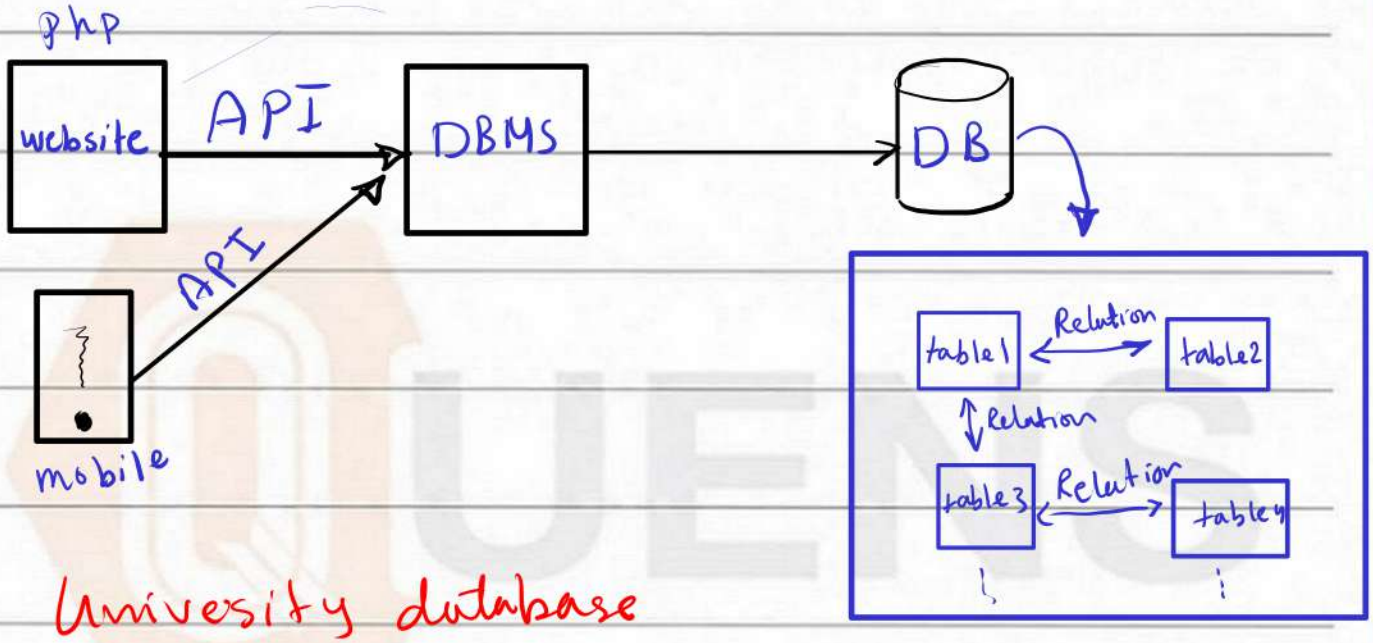
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QUENS

الـ DBMS لازم يبقى بيقدر يقوم بمهمتين

1. protect data. Bank money transfer . Hacker
2. Maintain data. Back up





University database

- Student
- Courses
- Grades Report
- Prerequesits
- Sections

→ university database Tables

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STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS

Column field

Record Row, tuple

Record

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	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	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

KUWAIT COLLEGE
م والتكنولوجيا
Private University

Database

Student

name → String

student number → Integer

class → Integer

major → String

Files (Vs) Database

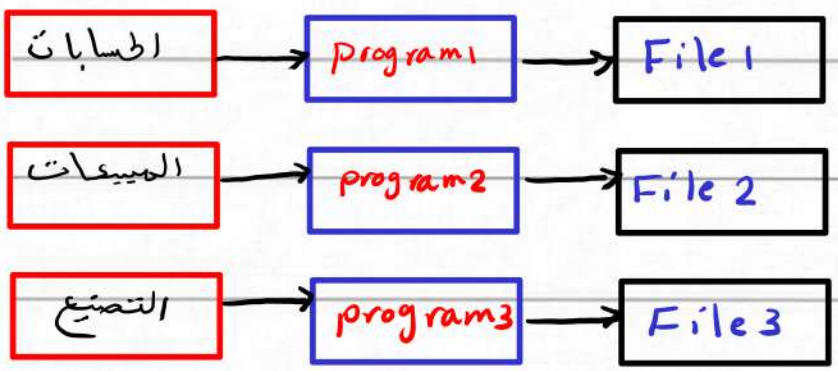
Redundancy (1)

Data dependency (2)

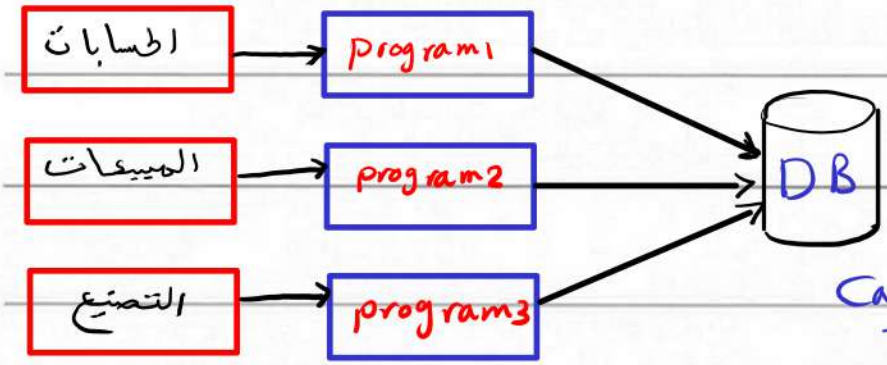
Limited data sharing (3)

data retrieval (4)

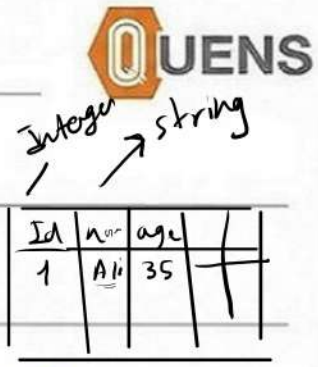
insufficient to scale (5)



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Catalog

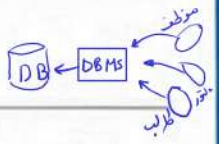


① Self describing nature.

metadata = data about data

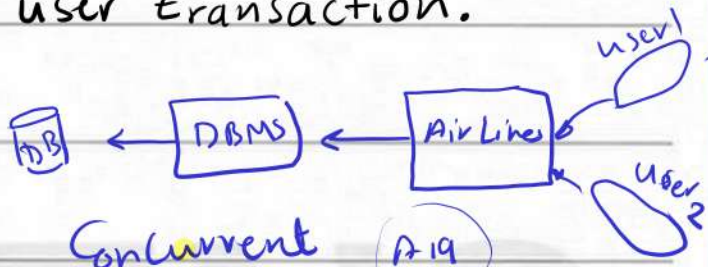
② Isolation between program and data.

③ Support of multiple views of data.



④ Sharing data and multi user transaction.

Concurrency Control



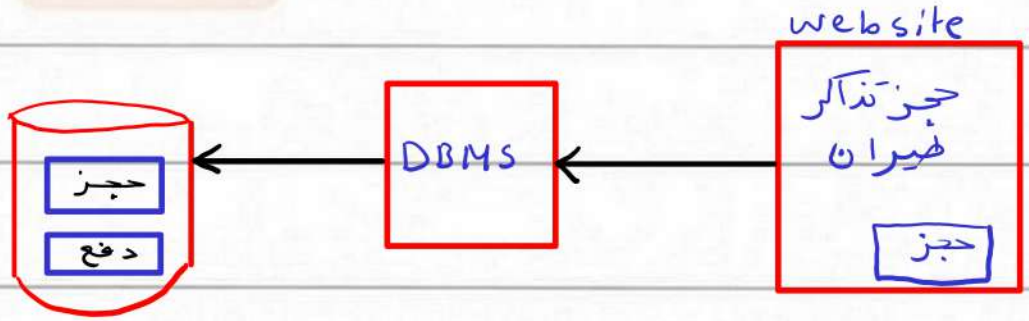
Software

Concurrent

A19

Transation : مجموعة عمليات لازم تتم كلها او تتلغى كلها

مثال



لو الدفع تم والحجز لم يتم ← roll back

Atomicity : All or none

Isolation : Transactions do not interfer with each other

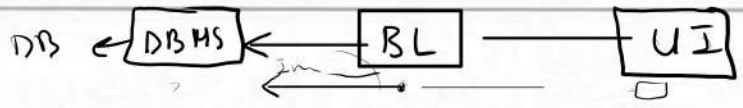
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Database users

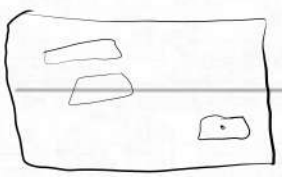
Restaurant → small database

Bank → Large database

1. DBA ✓ → Database administrator
   - * Install DBMS on servers.
   - * Control authorization.
   - * Handle issues related to hacking.
   - * Monitor problems.
   - * Backup.
2. Database Designer
   - * Data to be stored
   - * Database Structure
3. End user



- naive (parametric)
- Sophesticated
- System analysit
- Software developer



document → Designer

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