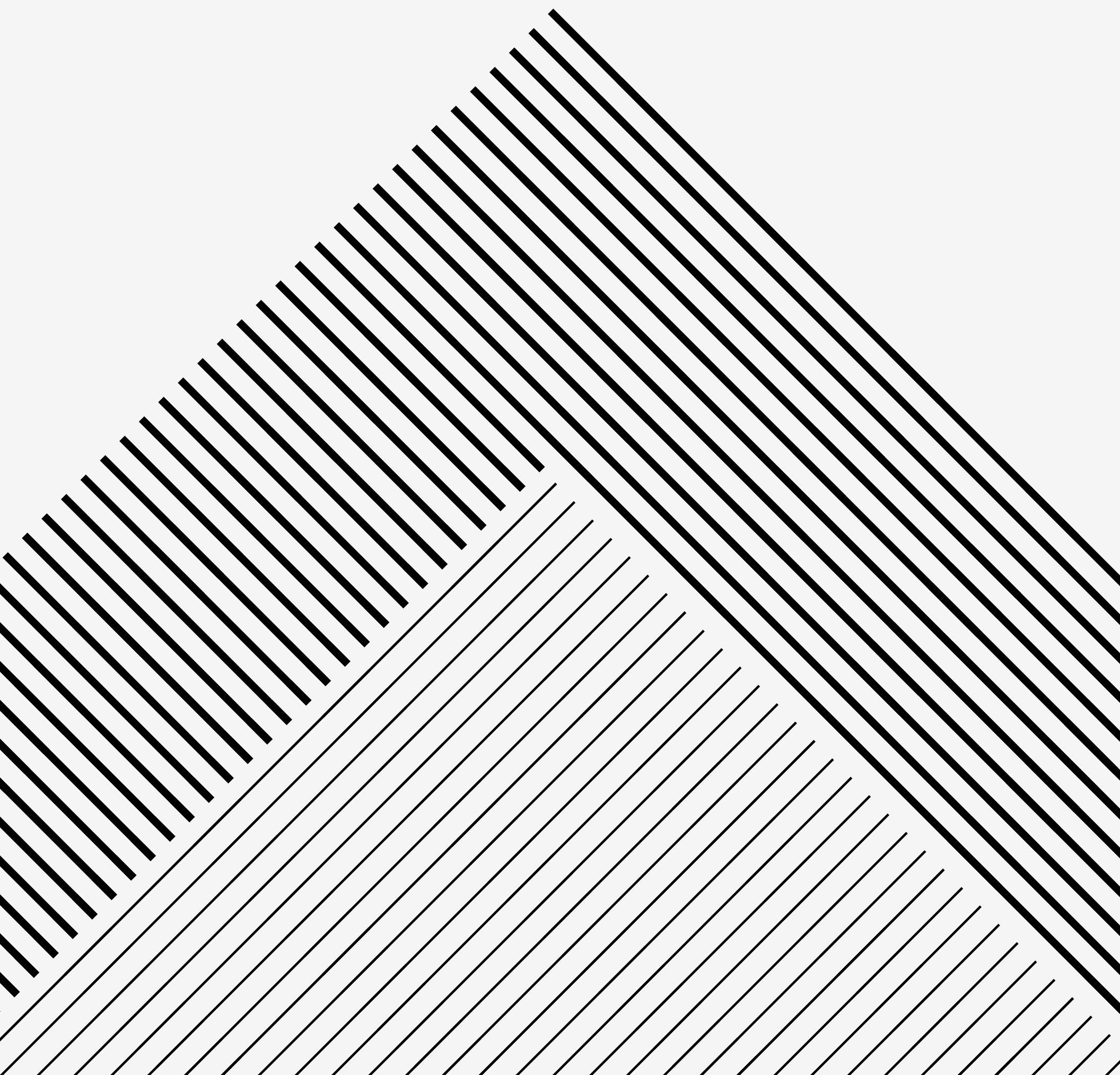


Week 1



## هذه انواع كثيرة للبيانات

object oriented db data stored in the form of objects (classes, objects)

Graph db data stored in the form of nodes (node, edge)

document db data stored as JSON objects (collection, document)

البيانات تخزن في السحابة (cloud) أو على المكان (on-site)

Primary Key → العاهم والمميز Unique value

foreign Key → connect the Primary Key of table 1 to table 2

Basic charts to Present data:

Bar chart

Bubble chart

Line chart

Pie chart

ما هي معايير اختيار chart؟

1- target audience

2- the idea u want to present

3- the goal u want to achieve

4- type and amount of data

هذين النوعين اساسياً وراحتها انواع تانية زي اى فرق

Relational db used for storing structured data in tabular format

big data

NoSQL db ↑ Provide a flexible structure for storing and scaling data (document db, key-value db, Graphdb)

1

2 Big data complex data that grows exponentially with time (IoT, social media) (unstructured, semi-structured)

3 more powerful than traditional data when solving problems, provides unique insights to help improve decision making

4

5 cloud hosting

6

7 Business Intelligence Analyzing data and other information to make informed decisions

8

9 SQL

10 DB uses DB management system to understand SQL

11

12 CRUD operations:

13 Create

14 Read

15 Update

16 Delete

17

18 SQL subsets:

19 Data definition language (DDL) Provides commands for defining deleting and modifying tables in db

20 (create, Alter, Drop) برمي الجدول وتعديله (Comment -- ) نظركتب

21 Data manipulation language (DML) The ability to query delete and update data in the db

22 (Insert, update, delete) ينالب البيانات الى جوا الجدول

23 Data query language (DQL) The ability To query and retrive data from the db

24 (Select) لقراءة البيانات

25 Data control language (DCL) Permissions

26 (grant, Revoke) للتحكم بالصلاحيات

27 Transaction control language (TCL) manage transactions in the db

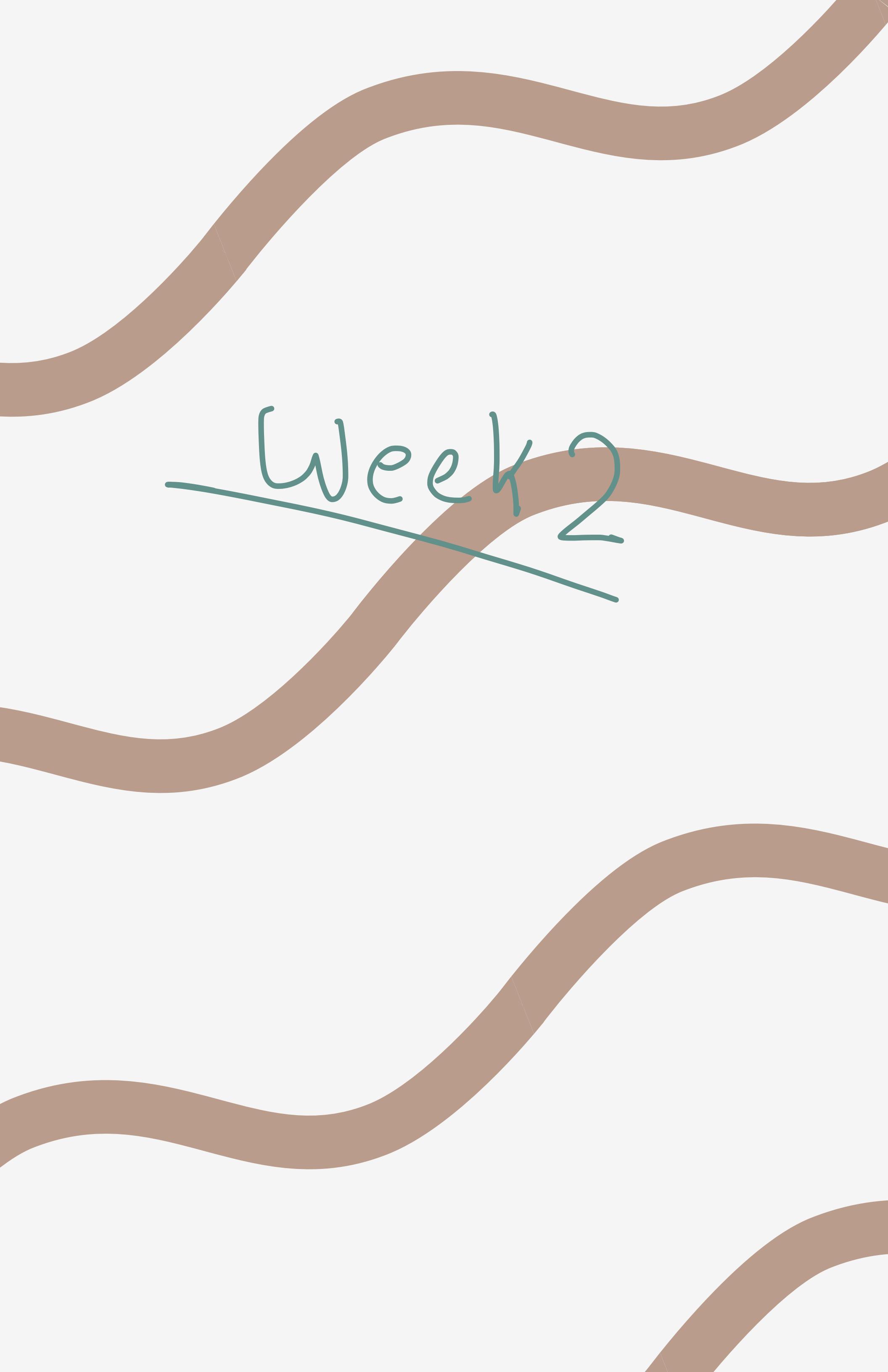
28 (Commit, Rollback)

29

30 CREATE DATABASE collage;

31 CREATE TABLE Students;





Week 2

# CRUD Operations

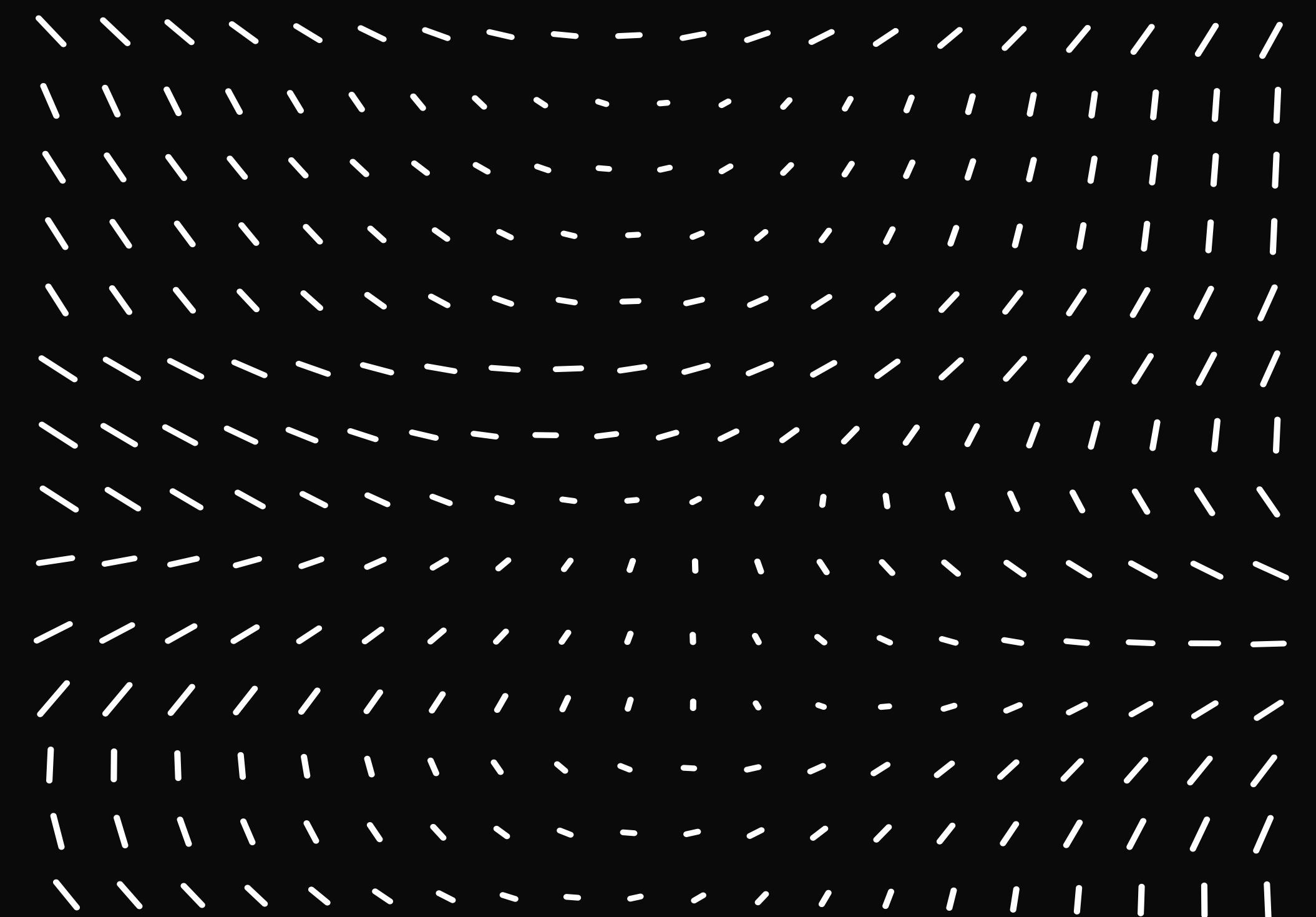
- 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
- 1 Numeric: Integer, Decimal, Tinyint
  - 2 String: Anything could be stored (mixed), Tinytext, Text, Mediumtext, Longtext
  - 3 Char: length is specified
  - 4 Varchar: length is not fixed
  - 5 Not Null: never empty
  - 6 Default: if there is no value it will set a default value
  - 7 CREATE DATABASE db-name;
  - 8 USE db-name;
  - 9 CREATE TABLE table-name(column1-name DATATYPE);
  - 10 SHOW tables; To display the tables in the selected db
  - 11 DROP DATABASE database-name;
  - 12 ALTER TABLE Table-name ADD (column-name DATA type); Add new column  
we can use other things
  - 13
  - 14 ALTER TABLE Table-name DROP column column-name;
  - 15 ALTER TABLE Table-name MODIFY column column-name Data-type;
  - 16 Insert into table-name (column-name<sub>1</sub>, column-name<sub>2</sub>) values (value<sub>1</sub>, value<sub>2</sub>);  
or  
Insert into table-name (column-name<sub>1</sub>, column-name<sub>2</sub>)  
values (value<sub>1</sub>, value<sub>2</sub>), (value<sub>1</sub>, value<sub>2</sub>);
  - 17
  - 18 SELECT \* FROM Table-name; To display all of the table content
  - 19 SELECT Column-name, Column-name FROM Table-name; u can use one column or many  
العمومي والتباين من ضمن  
العمومي والتباين من ضمن
  - 20 INSERT INTO target-table(column-name) SELECT Column-name FROM Source-table;
  - 21 UPDATE Table-name SET column-name = value, column-name = value WHERE column-name = value;
  - 22 or  
UPDATE Table-name SET column-name = value WHERE column-name = value;
  - 23 DELETE FROM Table-name WHERE column-name = value ; حذف Record او Row
  - 24 DELETE FROM Table-name حذف كل ال Rows محتوى التبل كاملاً من التبل موجوده
  - 25 or
  - 26 TRUNCATE TABLE Table-name ;
  - 27
  - 28
  - 29
  - 30
  - 31

A graphic design featuring a central, stylized text element 'week 2' in black, handwritten-style font. The text is positioned above a series of concentric, wavy lines that transition from dark orange at the top to light yellow at the bottom. These lines are set against a background of soft, pastel-colored organic shapes in shades of pink, light orange, and white. The overall composition is minimalist and modern.

week 2

- 1 Arithmetic operators: Used to perform mathematical calculations in a db (+, -, \*, /, %)  
أي عملية جبرية
- 2 SELECT column1 + column2 FROM table;  
أو على
- 3 SELECT \* FROM table WHERE column + column = value ;  
يرجع في الصفوف التي جمعها يعطين القيمة value
- 4 SELECT column \* 2 FROM Table ;  
يضرب كل قيمة في العمود في 2
- 5 we can use more than one operator in a statement
- 6 SELECT \* FROM Table WHERE column / column \* 100 >= value ;
- 7
- 8 Comparison operators: (=, >=, <=, <, >, <> or !=) it only return True or False results  
مقارنة قيم عمود بعمود ثان
- 9 SELECT \* FROM Table WHERE column < value ;
- 10 SELECT \* FROM Table WHERE column <<sup>not equal</sup> value ;  
(0-9)(A-Z), (Z-A)(0-9)
- 11 ORDER BY: ASC, DESC
- 12 SELECT \* FROM Table ORDER BY column1 ASC, column2 DESC ;
- 13 if u did not specify if u want the order by to be DESC or ASC it will be ASC by default
- 14 Logical operators :
- 15 ALL: مقارنة قيمة عمود بعمود ثان
- 16 AND: أكثر من شرط لازم الاثنين يكونون True أكتر من شرط لازم الاثنين يكونون True
- 17 ANY:
- 18 BETWEEN: يرجع القيم بين العقيدين المطلوب
- 19 EXISTS: يبحث عن سطفيه قيمة معينة
- 20 IN: يبحث عن سطفيه قيمة معينة
- 21 LIKE: يبحث عن قيمة متشابهة
- 22 NOT: تفبي تتحقق قبل أي عملية لمكس المفرجات
- 23 OR: استخدام أكثر من شرط واحد يكون True عارض
- 24 IS NULL:
- 25 UNIQUE: يبحث عن قيمة مميزة غير مكررة
- 26
- 27 SELECT \* FROM Table WHERE column = 'value' ORDER BY column ASC  
يرجع القيم المميزة ذات القيمة المطلوبة
- 28 SELECT DISTINCT column FROM table ;
- 29 NULL is considered a unique value
- 30 SELECT COUNT(DISTINCT column) FROM Table ; عدد القيم المميزة + Null

Week  
4



1 Schema: organization of information and its relationships  
 2 DB Schema: a structure to store DB (management, Accessibility, Security,  
 3 ownership) How data is organized in DB its a blueprint of a DB  
 4 Before using DB to store and manipulate data the DB Schema must first be designed  
 5 the process of designing a DB Schema is also known as data modeling its the  
 6 skeleton of DB it doesn't store any actual data  
 7

8 DB Schema can be divided into 3 categories:

- 9 1- Conceptual or logical schema: describes the structure (entities, features of the entities, relationship)
- 10 2- Internal or Physical schema: Physical storage of DB (low level) store on disk
- 11 3- External or view schema: view of a user (there can be more than one view of a DB)

12 Example to create a DB Schema:

```

13 create table customer (
14   customer-ID INT,
15   name VARCHAR(100),
16   address VARCHAR(250),
17   email VARCHAR(100),
18   phone VARCHAR(10),
19   PRIMARY KEY (customer-ID)
20 );
21

```

```

22 create table cart_order (
23   order-ID INT,
24   customer-ID INT,
25   Product-ID INT,
26   quantity INT,
27   order-date DATE ,
28   status VARCHAR(100),
29   PRIMARY KEY (order-ID),
30   FOREIGN KEY (customer-ID) REFERENCES customer (customer-ID),
31   FOREIGN KEY (Product-ID) REFERENCES Product (Product-ID)
);

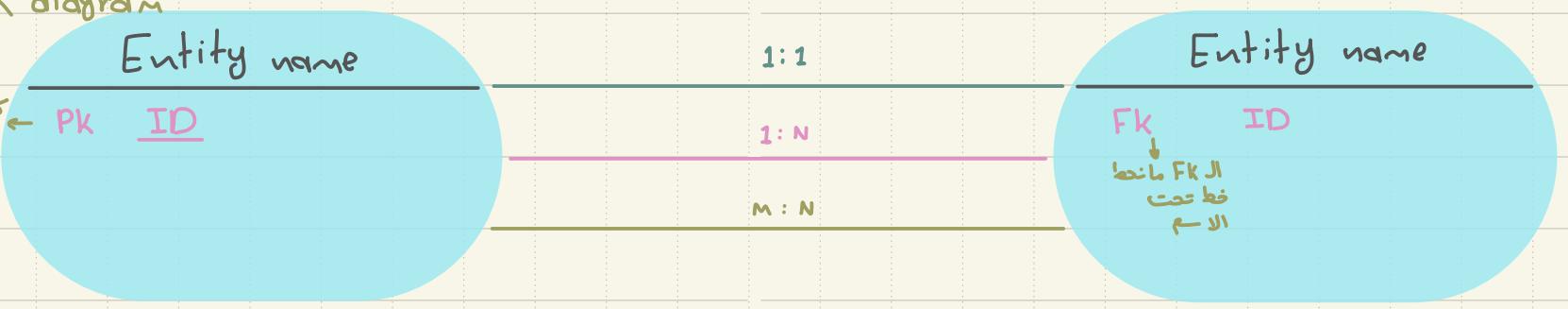
```

```

create table Product (
  Product-ID INT,
  name VARCHAR(100),
  Price NUMERIC(8,2),
  description VARCHAR(255),
  PRIMARY KEY (Product-ID)
);

```

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	Relation types:																								
2	one - to - many																								
3	one - to - one																								
4	many - to - many																								
5	relational models built around 3 main concepts : data, relationships, constraints																								
6	Degree → عدد الاعمدة في الـ Table																								
7	Cardinality → عدد الصفوف في الـ Table																								
8																									
9	Primary Key																								
10																									
11	Attributes:																								
12	Simple Attributes :																	قيمة وحدة زى GPA حقل A ما تقدر تفصل فيما							
13	composite Attributes :																	نقدر نقسمها زي الاسم الكامل نقدر نقطع ايم او ايم واحيز							
14	single valued Attributes :																	قيمة واحدة للشخص زى يوم ميلادك مائدة لا واحد							
15	multi valued Attributes :																	اقتر اخزن أكثر من قيمة زى الايميل يمكن عندك أكثر من ايميل							
16	derived attributes :																	زى قيمة العمر محسوبة من قيمة يوم الميلاد							
17	key attributes :																	قيمة مميزة زى ID							
18	entity name is not an attribute																								
19	ER diagram																								
20	Entity name																	1:1							
21	PK ID																	1:N							
22	البيانات الابعاد الاسم خط الا																	M:N							
23																									
24																									
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26																									
27																									
28																									
29																									
30																									
31																									



01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

1 Data normalization : minimize data duplications avoid errors during data modifications and simplify data queries  
2 from the DB

3 challenges:

4 1- Insert anomaly

ما اقدر اضيف مطرد بـ 3 معلومات الطالب ، الكورس ، القسم

5 2- update anomaly

تحديث اسم المحاضر لكل الطالب مثب لازم ما انس اي طالب

6 3- Deletion anomaly

ما احذف طالب راح يحذف كامل السطر بـ 3 معلومات المحاضر والكلية

لحل هدى المشاكل نقسم المطابق Table

7 DB normalization forms: Progrissive Normalization + بالترتيب

8 1- first normal form (1NF) 1 value in each single field , no duplication in the records , devide tables , assign PK , relations+FK

9 2- Second normal form (2NF) all dependences must be functions not Partial

10 3- Third normal form (3NF) no Transitive dependency

11 functional dependency To retrive a value u depend fully on PK there is no other way to get this value

12 Partial dependency composite PK To retrive a value

13 Transitive dependency 2 or more columns determine each other the country determine the language

14 DB constraints are used to limit the type of data value that can be stored in a table

15

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