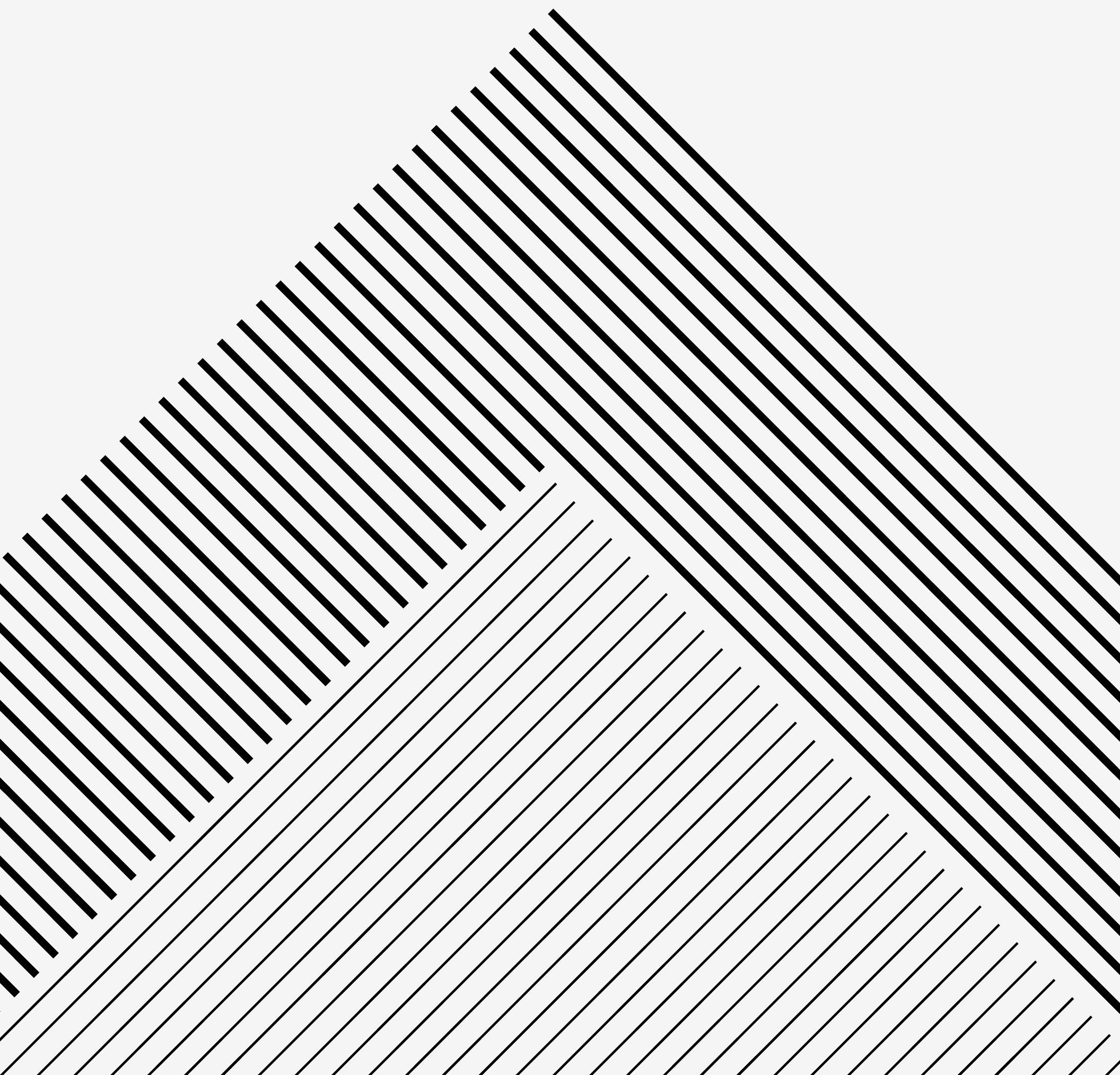


Module 1



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

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

big data

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 Business Intelligence Analyzing data and other information to make informed decisions

6

7 SQL

8 DB uses DB management system to understand SQL

9

10 CRUD operations:

11 Create

12 Read

13 Update

14 Delete

15

16 SQL subsets:

17 Data definition language (DDL) Provides commands for defining deleting and modifying tables in db
(create, Alter, Drop) برمي الجدول وتعديل على هيكله (--) comment نصيحتك

18 Data manipulation language (DML) The ability to query delete and update data in the db
(Insert, update, delete) ينادي بالبيانات نفسها الى جوا الجدول

19 Data query language (DQL) The ability To query and retrieve data from the db
(Select) لقراءة البيانات

20 Data control language (DCL) Permissions
(grant, Revoke) التحكم بالصلاحيات

21 Transaction control language (TCL) manage transactions in the db
(Commit, Rollback)

22

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1 row → record row → tuple Table → relation

2 data types: String, Numeric, date and time, Binary

3 applied on the column

4

5 Integrity constraints:

6 Key constraints: لازم يكون موجود بس امنا في استخراج البيانات ما ينفع يكون فارغ ممكن يكون عباره عن عاصمهين

7 Domain constraints: مكان القيمه المدخله لازم يكون صحيح ما ينفع اكتب الدسم مكان الرقم

8 Referential integrity constraints: اذا فيه علاقه بين 2 Tables لازم يكون Primary key الاول موجود كـ foreign key في الثاني

9

10 DB structure:

11 1-Tables 2-Attributes (العامده)

12 3-fields (column) 4-Record (row) 5-Primary key

13

14 Logical DB Structure : represent a DB using diagram

15

16 There is 3 relationships between entities

17 1-one-to-one 2-one-to-many 3-many-to-many

18

19 Keys:

20 Candidate key attribute يحتوي على قيم مميزة غير مكررة

21 Composite key attribute دمج أكثر من عامود مثان يمثل عامود مميز

22 Primary key عامود مميز غير مكرر

23 Alternate key مميزة زدي الـ Primary بس باختلافها تكون هو

24 Foreign key ربط Tables2 او اكتر

25

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Module 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 .
- 8 CREATE DATABASE db-name;
- 9 USE db-name;
- 10 CREATE TABLE table-name(column1-name DATATYPE);
- 11 SHOW tables; To display the tables in the selected db
- 12 DROP DATABASE data-base-name;
- 13
- 14 ALTER TABLE Table-name ADD (column-name DATA type); Add new column
- 15 ALTER TABLE Table-name DROP column column-name;
- 16
- 17 Insert into table-name (column-name1, column-name2) values (value1, value2);
or
Insert into table-name (column-name1, column-name2)
values (value1, value2), (value1, value2);
- 18
- 19
- 20
- 21
- 22 SELECT * FROM Table-name; To display all of the table content
- 23 SELECT Column-name, Column-name FROM Table-name; u can use one column or more
- 24
- 25 INSERT INTO target-table(column-name) SELECT Column-name FROM Source-table; الناتج من حفظ
نسخ ما هو من قبل في ثانية
العامون والكتيب الذي بنى نرسل لهم
- 26
- 27 UPDATE Table-name SET column-name = value, column-name = value WHERE column-name = value;
- 28 OR
- 29 UPDATE Table-name SET column-name = value WHERE column-name = value;
- 30
- 31

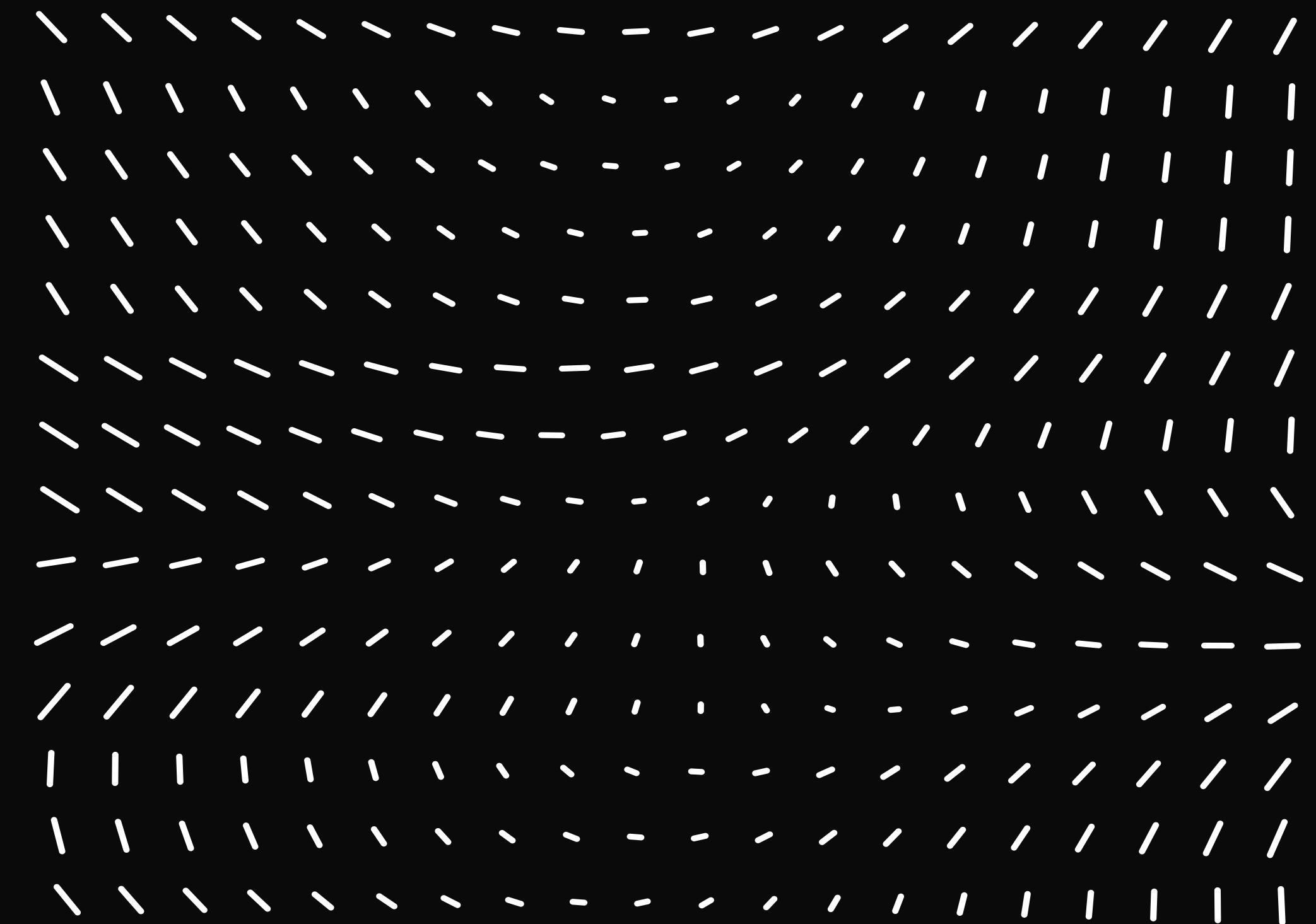
1	DELETE FROM Table-name WHERE column-name = value ;	حذف Record او Row
2	DELETE FROM Table-name	حذف كل ال Rows محتوى التبل كامل بس التبل موجوده
3	or	
4	TRUNCATE TABLE Table-name ;	
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Module 3

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 Arithmetic operators: Used to perform mathematical calculations in a db (+, -, *, /, %)
أو عمليات جبرية
- 2 SELECT column1 + column2 FROM table;
أو عمليات جبرية
- 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 قيمة عمود بعمود ثان
- 9 SELECT * FROM Table WHERE column < value ;
- 10 SELECT * FROM Table WHERE column <^{not equal} 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 الآثنين يكونون True
- 17 BETWEEN: يرجع القيم بين القيمتين المعطاه
- 18 EXISTS: يبحث عن سطر فيه قيمة معينة
- 19 IN: يبحث عن سطر فيه قيمة معينة
- 20 LIKE: يبحث عن قيم متشابهة
- 21 NOT: تفبي تستخدم قبل ادب عمليه لمكس المفرجات
- 22 OR: استخدام أكثر من شرط واحد يكون True
- 23 IS NULL: بدون قيمة
- 24 UNIQUE: يبحث عن قيم مميزة غير مكررة
- 25
- 26 يرجع القيم المميزة زي Unique
where ↑
- 27 SELECT DISTINCT column FROM column ; Null is considered a unique value
- 28
- 29 SELECT COUNT(DISTINCT column) FROM Table ; عدد القيم المميزة + Null
- 30
- 31

Module 4



1 Schema: organization of information and its relationships

2 DB Schema: a structure to store DB (management, Accessibility, Security, ownership) How data is organized in DB its a blueprint of a DB

3 Before using DB to store and manipulate data the DB Schema must first be designed
4 the process of designing a DB Schema is also known as data modeling its the
5 skeleton of DB it doesn't store any actual data

6
7 DB Schema can be divided into 3 categories:

8 1- Conceptual or logical schema: describes the structure (entities, features of the entities, relationship)

9 2- Internal or Physical schema: Physical storage of DB (low level) store on disk

10 3- External or view schema: view of a user (there can be more than one view of a DB)

11 Example to create a DB Schema:

Customers	
customer_Id	Int, PK
name	VARCHAR(100)
address	VARCHAR(250)
email	VARCHAR(100)
Phone	VARCHAR(10)

cart_order	
order_Id	Int, PK
customer_Id	Int, FK
Product_Id	Int, FK
quantity	Int
order_date	Date
status	VARCHAR(100)

Product	
Product_Id	Int, PK
name	VARCHAR(100)
Price	Numeric(8,2)
description	VARCHAR(255)

22 create table customer(
23 customer-ID INT,
24 name VARCHAR(100),
25 address VARCHAR(250),
26 email VARCHAR(100),
27 Phone VARCHAR(10),
28 PRIMARY KEY (customer-ID));

29 create table cart_order(
30 order-ID INT,
31 customer-ID INT, Product-ID INT,
quantity INT, order-date DATE,
status VARCHAR(100),
PRIMARY KEY (order-ID),
FOREIGN KEY (customer-ID) REFERENCES customer (customer-ID),
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																							
7	Primary Key																						
8																							
9	Attributes: entity name is not an attribute																						
10	Simple Attributes :																						
11	Composite Attributes :																						
12	single valued Attributes :																						
13	multi valued Attributes:																						
14	derived attributes :																						
15	key attributes :																						
16																							
17	Data normalization : minimize data duplications avoid errors during data modifications and simplify data queries																						
18	from the DB																						
19	Challenges:																						
20	1- Insert anomaly																						
21	2- update anomaly																						
22	3- Deletion anomaly																						
23																							
24	DB normalization forms:	Progressive Normalization + بالترتيب																					
25	1- first normal form (1NF)	1 value in each single field , no duplication in the records , devide tables , assign PK , relations+FK																					
26	2- Second normal form (2NF)	all dependences must be functions not Partial																					
27	3- Third normal form (3NF)	no Transitive dependency																					
28																							
29	functional dependency	To retrive a value u depend fully on PK there is no other way to get this value																					
30	Partial dependency	composite PK To retrive a value																					
31	Transitive dependency	2 or more columns determine each other the country determine the language																					

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