Introduction to Data and Database

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Additional Rules? Nope

Just to make the class better!

1. There is no stupid questions!
2. Make sure to mute your mic so it won't disturb others
3. **You must enjoy the class!** If not, immediately raise your issue by click raise hand or comments in the chat

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One thing we should know

before we start ...

"Without big data, you are blind and deaf and in the middle of a freeway"

- Geoffrey Moore

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Table of Content

What will We Learn Today?

1. What is Data?
2. What is Database?
3. What is SQL and DBMS?
4. What is data types?
5. Data "Lifecycle"
6. Google Collabs environment
7. DBeaver Installment

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DATA

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DATA

noun /ˈdeɪ.ɾə, dæɾ.ə/

Information, especially **facts** or **numbers**, collected to be **examined** and considered and used to help **decision-making**, or information in an electronic form that can be stored and used by a computer.

Format: text, spreadsheet, image, audio, video, etc.

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DATA

Categorical Data

- Nominal (classification): gender, cities, name
- Ordinal (weighted classification): education, ranking

Numerical Data

- Discret (count): total kids
- Continuous (measurement)
  - Interval: temperature
  - Rasio: height, weight

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DATA

Wisdom

1

Highest level is when we add insight to knowledge that enables understanding, integration, and actionable.

Knowledge

2

Given meaning change information into knowledge. It's already contextual, synthesized, and capable to give learning.

Information

3

Once given some context, it becomes more useful, organised, and structured.

Raw Data

4

Can be retrieved from anywhere. We know nothing yet!

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Pick the right definition!

- It’s 1 PM
- 1 PM is lunch time
- 1
- His family's favorite for lunch is Indonesian food

- Data
- Information
- Knowledge
- Wisdom

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DATABASE

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DATABASE

an organized collection of data stored and accessed electronically.

For example, a company database may include tables for products, employees, and financial records.

Advantages:

1. Reduced data redundancy
2. Greater data integrity and ensures consistency of data
3. Improved data access to users through use of host and query languages
4. Provides greater security and privacy of data
5. Shows you the big picture
6. Robust backup and recovery

Some Tech Definitions

- DBMS (Database Management System)
  - software designed to store, retrieve, define, and manage data in a database
- SQL (Structured Query Language)
  - a domain-specific language used in programming and designed for managing data held in a relational database management system
- DDL (Data Definition Language)
  - SQL command to define the schema
  - CREATE, DROP, ALTER, TRUNCATE, COMMENT, RENAME
- DML (Data Manipulation Language)
  - SQL command to query informations, fill data, change data, update data, or delete data from database
  - SELECT, INSERT, UPDATE, DELETE

DATABASE

DATABASE (Structured)

- PRO
  - Easier implementation for Machine Learning
  - Easily used by business users/end users
  - Compatible with lot of tools
- CONS
  - Limited to relational database only
- TOOLS
  - MySQL, MS SQL, PostgreSQL, SQLite, etc

DATABASE (Unstructured)

- PRO
  - Keep original format as it is
  - Faster processing time
  - Save more storage while saved in data lake
- CONS
  - Need extra technical skills
  - Need specific tools
- TOOLS
  - MongoDB, DynamoDB, Hadoop, etc

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DATABASE - Data Types

Numeric	Date/time	Character/String	Unicode Character	Binary	Miscellaneous
int	date	char	nchar	binary	clob
bigint	time	varchar	nvarchar	varbinary	blob
smallint	datetime	text	ntext		xml
float	timestamp				json
decimal	year				
real					
bit					

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DATABASE - Data Models

Relationship Cardinality

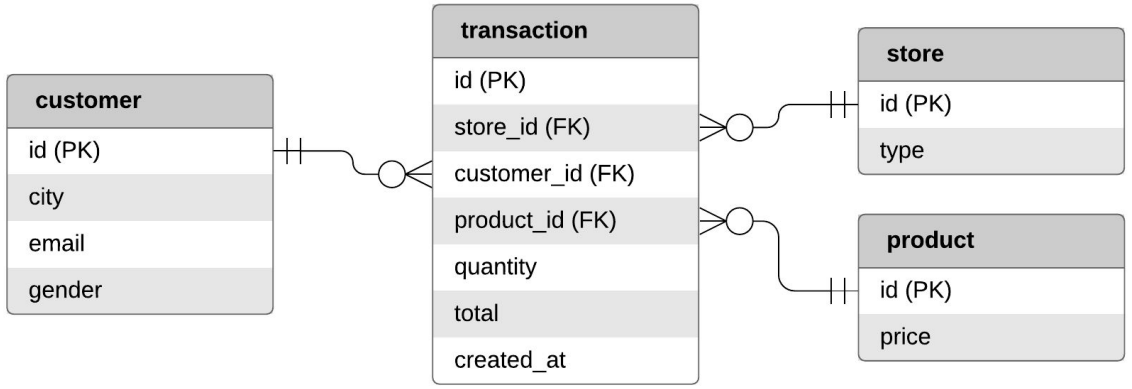
- one to one (1:1)
- one to many (1:M)
- many to many (M:N)

Participant Constraint

- Mandatory
  - At least there's one entity that associated with entity A
- Optional
  - Allowed to have none entity that associated with entity A

Entity types

- Strong: Can stand alone
- Weak: Need others
- Associative: Created by other entities



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DATA LIFECYCLE

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DATA LIFECYCLE

also called the information life cycle, refers to the entire period of time that data exists in your system from first capture onwards.

PS: 8 would go to 1 again

1. Generation
2. Collection
3. Processing
4. Storage
5. Management
6. Analysis
7. Visualization
8. Interpretation

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GOOGLE COLLABS ENVIRONMENT

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DBEAVER INSTALLMENT

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Thank YOU