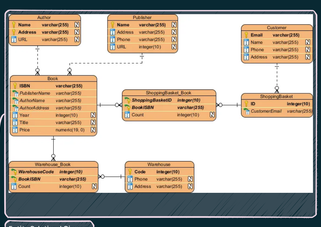
ERD Created by github.com/farzadafi

what?



- Entity Relational Diagram
- Entity-relationship diagrams show how data objects relate to each other in a database.
- explains the relationship among the entities present in the database.
- With just three basic elements
  - entities
  - attributes
  - relationships
- In short, ER Diagram is the structural format of the database.

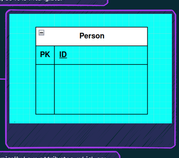
Why Use?

- ER diagrams are used to represent the E-R model in a database, which makes them easy to be converted into relations (tables).
- An ER diagram is the first step in designing a database and an ERD helps the designer avoid problems down the road when actually creating the database.
- ER diagrams provide the purpose of real-world modeling of objects which makes them intently useful.
- ER diagrams require no technical knowledge and no hardware support.
- These diagrams are very easy to understand and easy to create even for a naive user.
- It gives a standard solution for visualizing the data logically.

Entity and Attribute

Entity

- an entity represents a real-world object, concept, or thing that can be uniquely identified and described.
- It can be a physical object, such as a person, place, or thing, or an abstract concept, such as an event or appointment.
- Database entities can further be divided into tangible and intangible entities. If the entity physically exists in the real world, then it is tangible. A person is tangible, as is a city, if it exists logically in the real world, then it is intangible. A job is not a physical thing that you can touch, so it is intangible.
  - The same goes for your car – tangible – and your car insurance – intangible
- image



Attribute

- Entities typically have attributes, which are properties or characteristics that describe them and define their relationships with other entities.
- For example, a Person entity may have attributes such as name, age, and gender.

- These attributes provide additional information about the entity and define the specific instances of the entity.

Database

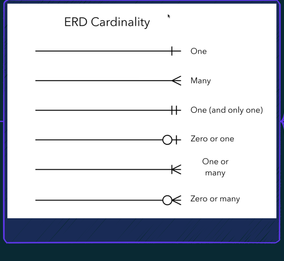
- in database, each row is a entity and each column is a attribute

	Attribute	Attribute
Entity		
Entity		
Entity		
Entity		

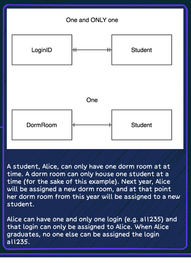
Relation

- Relationships describe how entities are associated with each other.
- There are different types of relationships that can exist between entities:
  - One-to-One (1:1) — One instance of an entity is related to only one instance of another entity.
  - One-to-Many (1:N) — One instance of an entity is related to multiple instances of another entity.
  - Many-to-One (N:1) — Multiple instances of an entity are related to only one instance of another entity.
  - Many-to-Many (N:N) — Multiple instances of an entity are related to multiple instances of another entity.
- The relationships in an ERD are represented using various symbols, such as lines with arrows, crow's foot notation, or Chen notation, to depict the cardinality and participation constraints.
- These relationships help in modeling and designing databases, as they provide a visual representation of how the entities are connected and how data can be accessed and manipulated within the database system.

relation



one VS one and only one



A student, Alice, can only have one dorm room at at time. A dorm room can only house one student at a time (for the sake of this example). Next year, Alice will be assigned a new dorm room, and at that point her dorm room from this year will be assigned to a new student.

Alice can have one and only one login (e.g. al1235) and that login can only be assigned to Alice. When Alice graduates, no one else can be assigned the login al1235.