How to Draw an Entity Relation Diagram (ERD)

A step-by-step process to draw an entity relation diagram (ERD) is:

**Step 1: Identifying Entities**

Determine the main objects you want to represent in the database. E.g., “students", "courses", or "products".

**Step 2: Defining Attributes**

Identify the properties(attributes) of properties of each entity. These attributes provide more details about an entity.

**Step 3: Specifying Relationships**

Create relationships between entities to specify how entities interact with each other. Relationships are verbs like "teaches", "studies", or "sells".

**Step 4: Drawing Entities**

Draw entities as rectangle and write the name.

**Step 5: Adding Attributes**

To add attributes of a entity write attributes inside the rectangle or connect them with lines.

**Step 6: Connecting Entities**

Draw lines between the related entities to represent their connection.

**Step 7: Specifying Cardinality**

Indicate the minimum and maximum number of relationship instances associated with an entity using notations like crow's foot.

**Step 8: Organizing ER Diagram**

Organize all entities and relationships in a clean way for better readability and understanding.

**Draw Entity Relationship Diagram Example**

After learning the steps of how to draw an entity relationship diagram, we will create a demo ER diagram.

Let’s take an example of ER diagram for a bank through which we can learn how to design an ER and understand all the required methods.

**Entity Relationship Diagram for BANK**

We will follow the steps mentioned above, to draw entity relationship diagram for bank.

**Defining Entities**

A thing in the real world with an independent existence. It is may be an object with physical existence (ex: house, person) or with a conceptual existence (ex: course, job). The are represented by rectangle.

Entities for Bank are: Bank, Branch, Employee, customer, loan, account.

**Adding Attribute**

Attributes are the kind of properties that describe the entities. They are represented by ovals.

Attributes for Bank are:

For Bank Entity the Attributes are Bname, code.

For Branch Entity the Attributes are Blocation, Bcode.

For Employee Entity the Attributes are Eid, Designation, salary.

For Customer Entity the Attributes are Cid, Cname, Address, DOB.

For Loan Entity the Attributes Are Loan\_no, amount, rate.

For Account Entity the Attributes are acc\_no, type.

**Establishing Relationships**

Entities have some relationships with each other. Relationships define how entities are associated with each other.

Let's Establishing Relationships between them are:

The Bank has branches.

The Branch provides loan.

The Employee works in branch.

The Branch contains customers.

The Customers has account.

The Branch maintains account.

The Customer avails loan.

**Specify cardinality for Bank:**

Bank and branch has One to Many relationship (a bank has multiple branches).

Branch and loan has also One to Many relationship (a branch can provide many loans).

Branch and employee has One to Many relationship (one branch has many employees).

Branch and account has One to Many relationship (one branch has many accounts).

Branch and customer has Many to Many relationship (multiple branches have multiple customers according to relation between these two entities).

Customer and account has Many to Many relationship (multiple customers have multiple accounts according to relation between these two entities).

Customer and loan has Many to Many relationships (multiple customers have multiple loans according to relation between these two entities).

**Identify Primary Keys**

Primary keys are the unique identifier for each record in database table. It is denoted by an underline under the attribute name.

The Primary key of Bank is Code.

The Primary key of Branch is BrCode.

The Primary key of Employee is Eid.

The Primary key of Customer is Cid.

The Primary key of Loan is loan\_no.

The Primary key of Account is acc\_no.

