# ER Diagrams - Practice

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Slides and codes (p6) are available in the Ninova System.

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## Main Steps in the Development of the Data Model

- Identify initial entitites
- Identify direct relationships between the entitites
- Construct an initial diagram
- Identify additional characteristics
- Rationalize and validate the model

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## A Sample Database Design

- Business System
  - Data Modelling
  - Database Design

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## General Information

- Customers place orders for the products they would like to purchase
- Sales representatives serve the customers to help in placing the orders
- Warehouse stores the products
- For each order a receipt is given to the customer

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## Initial Entities

- <u>Customers</u> place <u>orders</u> for the <u>products</u> they would like to purchase
- <u>Sales representatives</u> serve the customers to help in placing the orders
- <u>Warehouse</u> stores the products
- For each order, a <u>receipt</u> is given to the customer

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## Descriptive Information

- Each product is defined with its attributes such as: barcode, name, type, cost, etc.
- Each customer has: customer_id, name, address, phone, credit_status, etc.
- Each sales representative has: employer_id, name, sales_score, salary, etc.

## Relationships

- Each sales representative may serve more than one user
- Each may be served by more than one sales representative
- Customers may place more than one order each containing more than one product
- An order is placed by only one customer
- A receipt is assigned to an order
- Warehouse store many products

## Entities

- Regular Entities: Customer, Sales Represetative, Warehouse, Product
- Conceptual entities: Order, Receipt

> Order is a weak entity
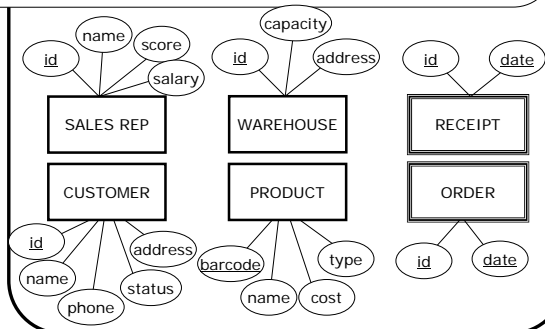> Receipt is a weak entity

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An entity is:
•   a thing about which the system holds information
•   A type of thing with many particular instances
•   An owner of a set of attributes
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## Entities and Attributes

## 1-to-1 Relationship

- Between the order and the receipt
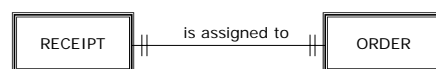
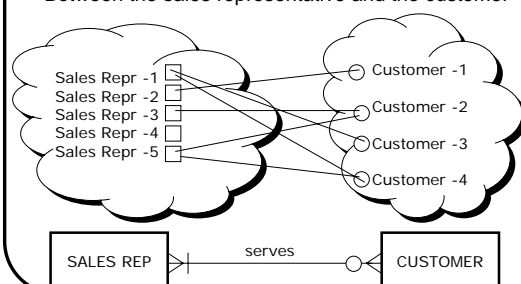## 1-to-many Relationship

- Between the customer and the order
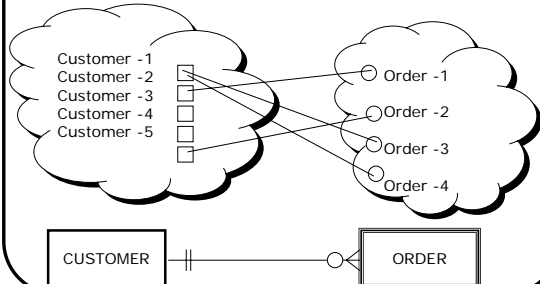
## Many-to-Many Relationship

- Between the sales representative and the customer

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## Intersection Entities for Many-to-Many Relations
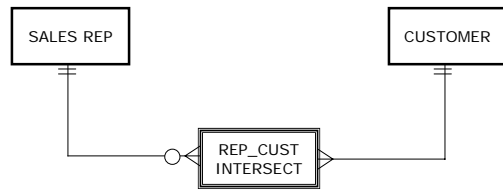
SALES REP              CUSTOMER
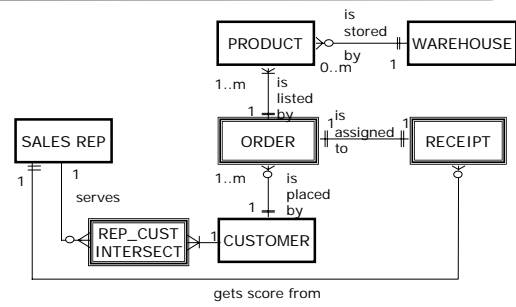
REP_CUST
INTERSECT

## ER Diagram of the System

PRODUCT    is stored by    WAREHOUSE

0..m    1

1..m   is listed by

1

SALES REP     ORDER   is assigned to   1   RECEIPT

1      1

serves    1..m   is placed by

REP_CUST
INTERSECT   1   CUSTOMER

gets score from