Attributes

In this lesson, we discuss the different types of attributes present in an ER diagram.

We'll cover the following

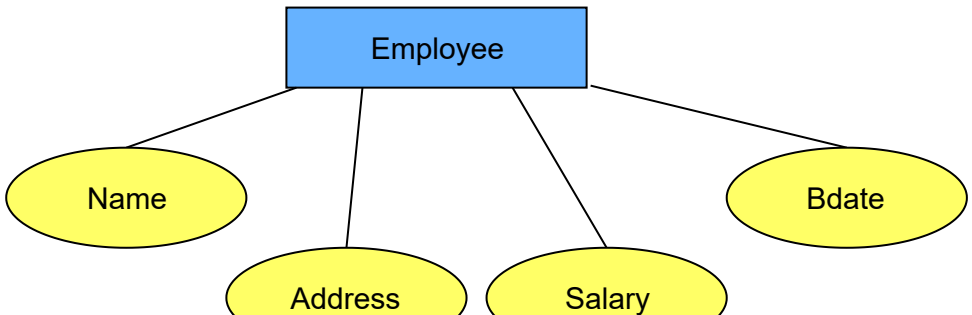
- Attributes
- Types of attributes
  - Simple attributes
  - Composite attributes
  - Multivalued attributes
  - Derived attributes

Attributes

As stated in the previous lesson, each entity is described by a set of attributes. For example, the EMPLOYEE entity has attributes `Name`, `Address`, and `Salary`, etc.

Each attribute has a name, is associated with an entity, and has a range of values it is allowed to take (an employee's salary cannot be negative). However, information about the domain of an attribute is not presented in the ER diagram.

In the entity-relationship diagram shown below, each attribute is represented by an oval with a name inside.



An EMPLOYEE entity represented along with its attributes.

Types of attributes

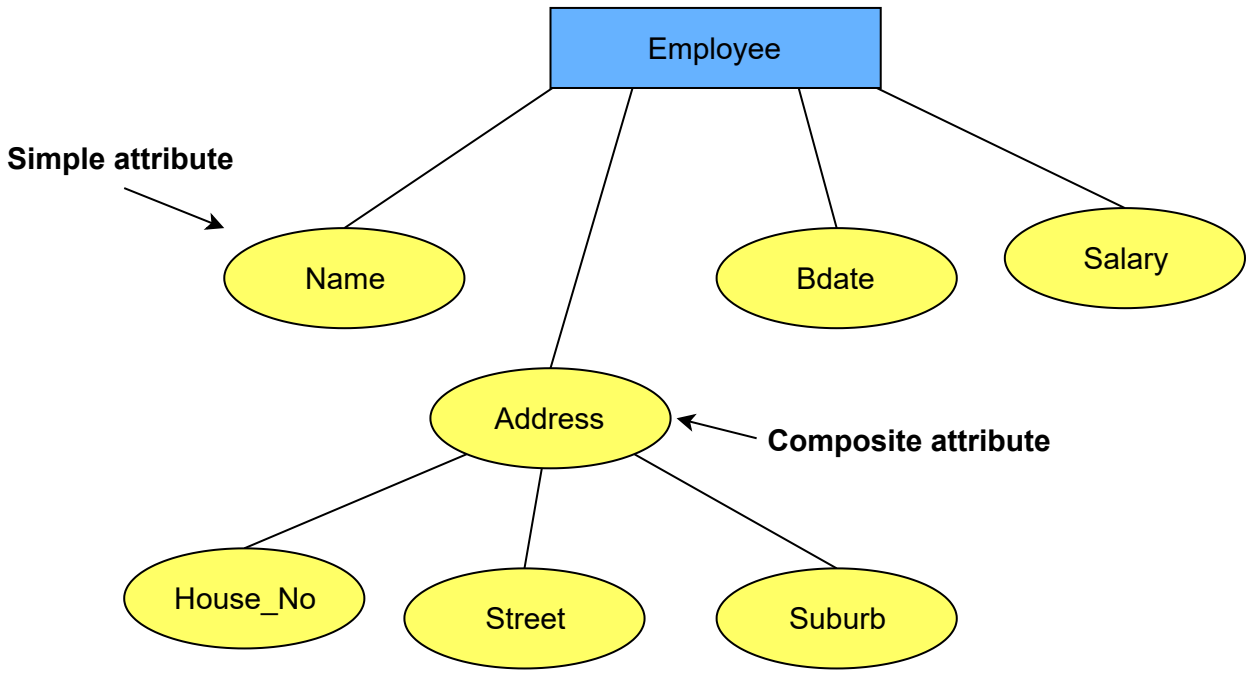
There are a few types of attributes you need to be familiar with.

Simple attributes

Simple attributes are the atomic value, i.e., they cannot be further divided. They are also called single-value attributes. In the COMPANY database, an example of this would be: `Name` = 'John' and `Age` = 23.

Composite attributes

Composite attributes can be divided into smaller subparts, which represent more basic attributes with independent meanings. Therefore, composite attributes consist of a hierarchy of attributes. Using our COMPANY database example, the `Address` attribute may consist of `House_No`, `Street` and `Suburb`. So this would be written as Address = 59 (`House_No`), Meek Street (`Street`), Kingsford (`Suburb`). The diagram below illustrates this concept:

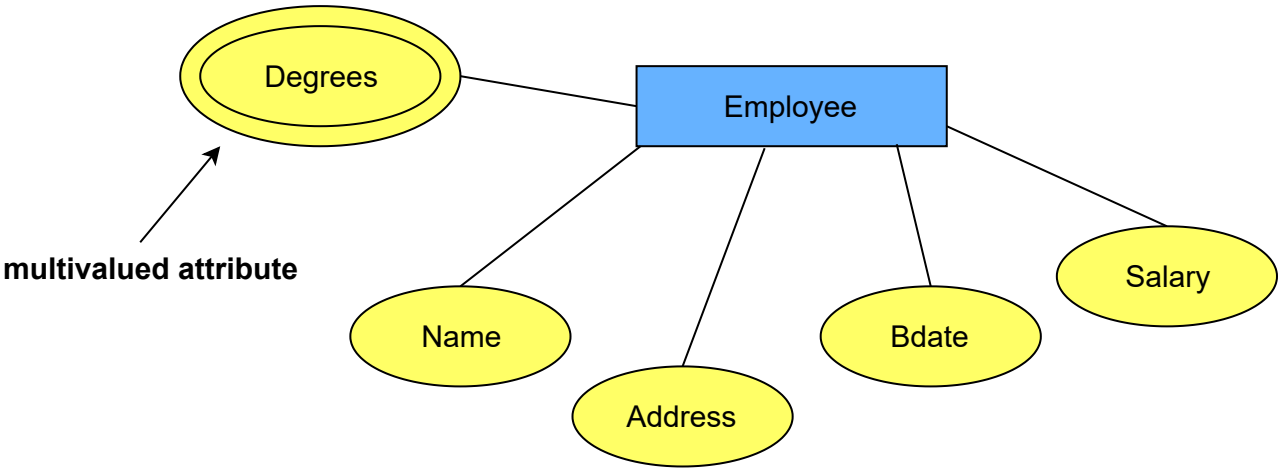


We can see simple and composite attributes highlighted in the diagram.

Multivalued attributes

Multivalued attributes have a set of values for each entity. An example of a multivalued attribute from the COMPANY database; one employee may not have any college degrees, another may have one, and a third person may have two or more degrees. Therefore, different people can have a different amount

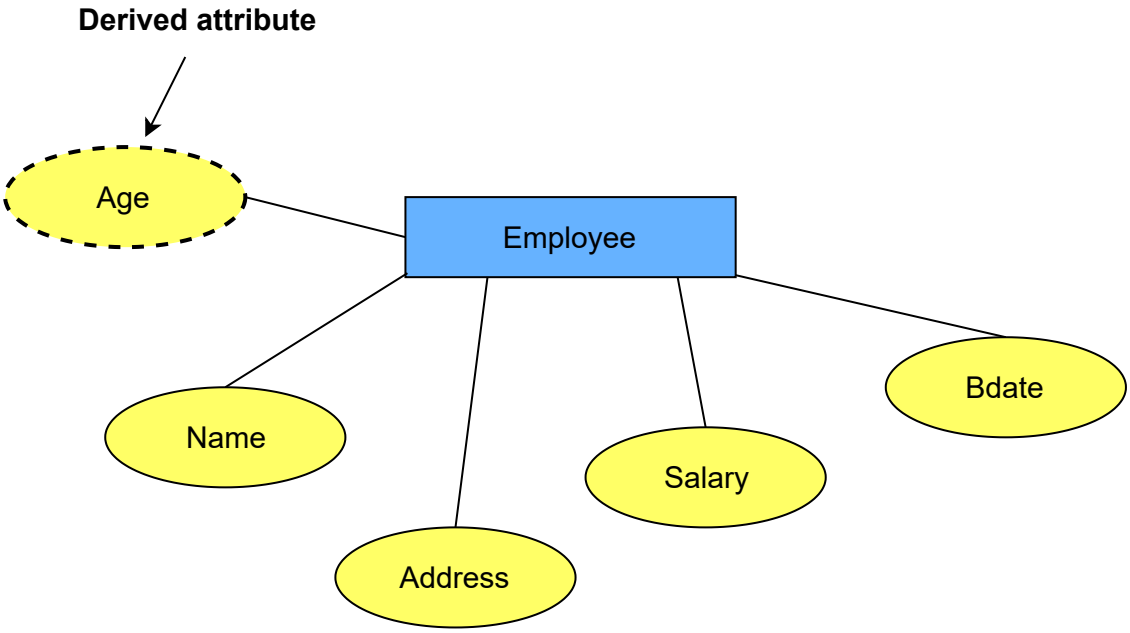
two or more degrees. Therefore, different people can have a different amount of values for the `Degrees` attribute. This is illustrated in the diagram below:



In ER diagrams multivalued attributes are represented with double outlines.

Derived attributes

Derived attributes are attributes that contain values calculated from other attributes. An example from the COMPANY database is that `Age` can be derived from the attribute `Bdate`. In this situation, `Bdate` is called a **stored attribute**, which is physically saved to the database. The image below highlights this concept:



In ER diagrams multivalued attributes are represented with dotted outlines.

The next lesson will be about keys and how they act as a constraint for entities.