Keys

In this lesson, we discuss the basics of keys and how they are represented using ER diagrams.

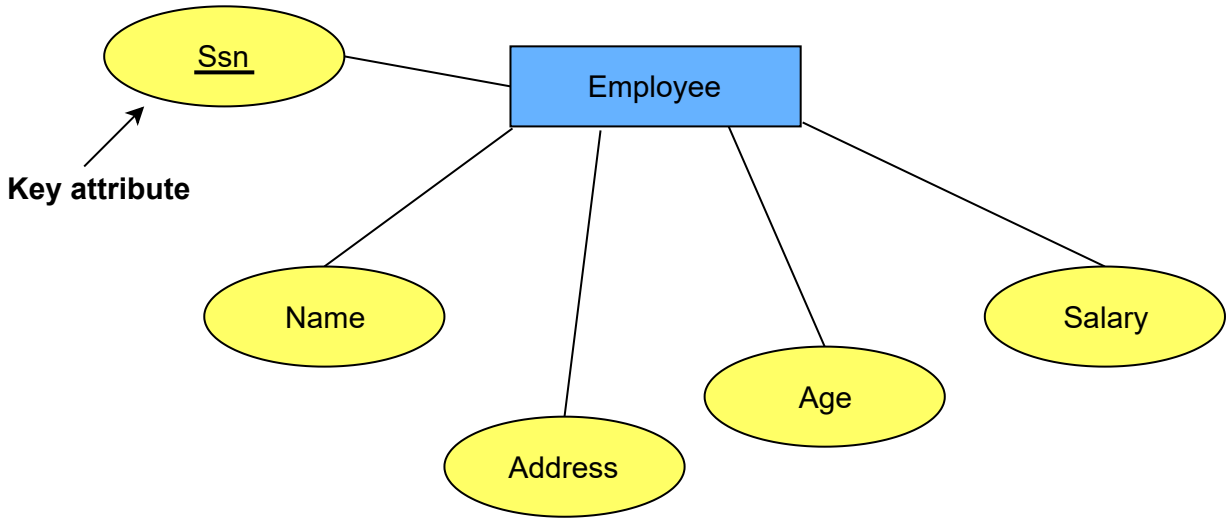
We'll cover the following

- Key attributes of an entity type
  - Composite keys

Key attributes of an entity type

An important constraint on the entities of an entity type is the **key** or **uniqueness** constraint on attributes. An entity type usually has one or more attributes whose values are distinct for each individual entity in the entity set. Such an attribute is called a **key attribute**, and its values can be used to identify each entity uniquely. For the EMPLOYEE entity type, a typical key attribute is `Ssn` (Social Security number) as each person has a unique social security number.

In an ER diagram, each key attribute has its name underlined inside the oval, as illustrated in the figure below:



Ssn can be used to uniquely identify each employee so it is the key attribute.

Specifying that an attribute is a key of an entity type means that the preceding uniqueness property must hold for every entity set of the entity type. Hence, it is a constraint that prohibits any two entities from having the same value for the key attribute at the same time. This unique attribute is also known as the **primary key**.

Other examples of primary keys in the COMPANY database include `Dept_Id` which can be used to identify each department in the company. Also, `Project_Id` acts as the key attribute for the PROJECT entity.

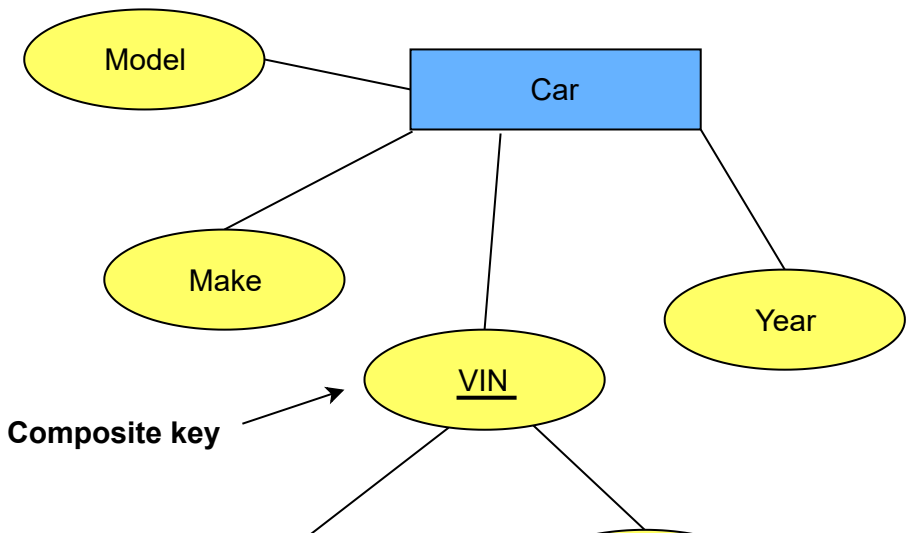
Composite keys

Sometimes a single attribute is not enough to uniquely identify each entity within an entity set.

Let's take the example of a CAR entity. The `VIN` (vehicle identification number) attribute is formed from two simple component attributes, `State` and `Number`, neither of which is a key on its own, as both can never be unique for every car. However, their combination can uniquely identify every car in the country.

In cases like this, several attributes together form a key, meaning that the combination of the attribute values must be distinct for each entity. If a set of attributes possesses this property, the proper way to represent this in the ER model that we describe here is to define a composite attribute and designate it as a key attribute of the entity type. This is called a **composite key**.

So in the example of the CAR entity `VIN` is a composite key.



VIN is a composite key made up of State and Number

In the next lesson, we will move onto the next component in an ER diagram: relationships.