System Analysis and Database Design
2nd class

> • **Domain**: set of values allowed for an attribute

An entity may be a physical object such as a house or a car, an event such as a house sale or a car service, or a concept such as a customer transaction or order

A relationship captures how two or more entities are related to one another. Relationships can be thought of as <u>verbs</u>, linking two or more nouns.
Examples: an **owns** relationship between a company and a computer.   : a **supervises** relationship between an employee and a department   : a **performs** relationship between an artist and a song,.
           : a **proved** relationship between a mathematician and a theorem

Entity sets are drawn as rectangles, attributes are drawn as oval. Entity is connected with an attribute with lines. Diamonds represent relationship among entity set.

Figure 2.1 shows an ER diagram notation for an attribute (*Grade*) of an entity (*student*)
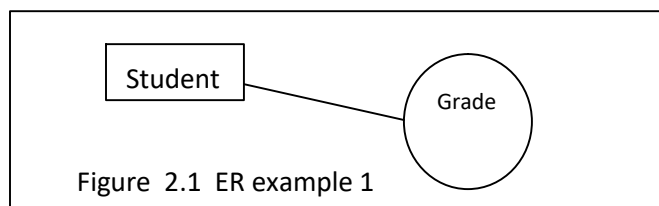

Figure 2.1 ER example 1
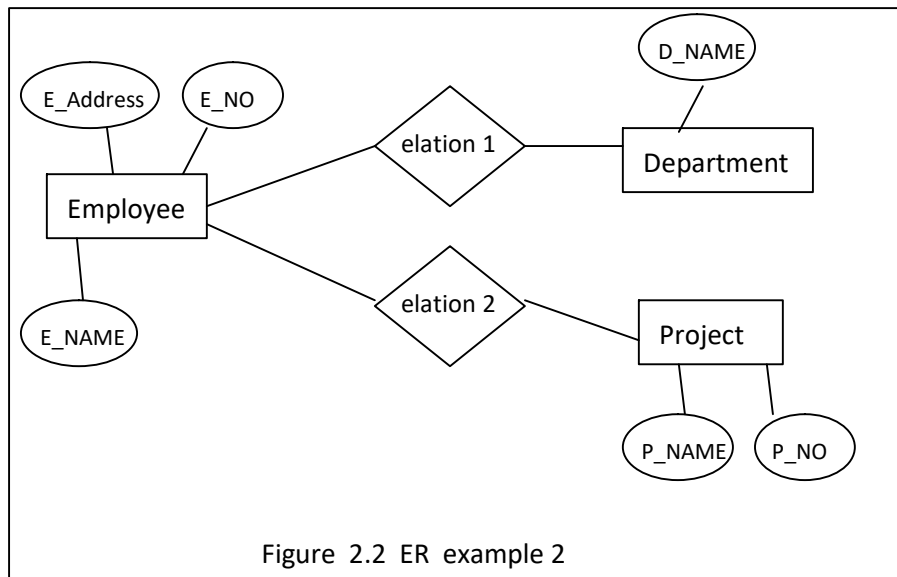
Figure 2.2 shows the following example :

There are three entity:

1- Employees : E#,ENAME, ADDRESS
2- Departments : D#,DNAME
   3-Projects : PNAME

There are two relations that connect the three entities

Figure 2.2 ER example 2

2.1.2 The Relational model

The Relational Model is a clean and simple model that uses the concept of a relation using a table rather than a graph or shapes. The information is put into a grid like structure that consists of columns running up and down and rows that run from left to right, this is where information can be categorized and sorted.

The relational model used the basic concept of a relation or table. The columns or fields in the table identify the attributes such as name, age, and so. A tuple or row contains all the data of a single instance of the table such as a person named Doug. In the relational model, every tuple must have a unique identification or key based on the data as shown in figure 2.3 , a social security account number (SSAN) is the key that uniquely identifies each tuple in the relation. Often, keys are used to join data from two or more relations based on matching identification.

Figure 2.3   Relation (Table)