13 Databases and Software Development

13.1 Entity Relationship Modelling

An **entity** is a category of object about which data is to be recorded.

- Each entity in a database system has **attributes**.
- Each entity needs an **entity identifier** which uniquely identifies the entity.
- The **primary key** is the entity identifier in a **relational database**.

An **entity description** is written using the format.

EntityName (PrimaryKey, Attribute1, Attribute2)

Two entities are said to be **related** if they are linked in some way.

The **degrees of relationship** between two entities can be

- One-to-one
- One-to-many
- Many-to-many

An **entity relationship diagram** is a diagrammatic way of representing the relationship between the entities in a database. Shows the

- Degree of relationship.
- Name of the relationship.

Relational Database

In a relational database, a separate **table** is created for each entity identified in the system.

- Where a relationship exists between entities, an extra field called a **foreign key** links the two tables.
- A foreign key is an attribute that creates a join between two tables - it is the attribute that is **common to both tables**.
- The primary key in one table is the foreign key in the table to which it is linked.

Many-to-many Relationships

Tables cannot be linked directly in a many-to-many relationship. Instead, create a **link table** with two foreign keys, each linking to one of the two tables. The two foreign keys also act as the primary key of the table.

A primary key which consists of more than one attribute is called a **composite primary key**.