Advanced ER Modelling Concepts

Topics List

- Weak Entity Types
- Recursive Relationships
- Multivalued Attributes

Weak Entity Types

- All of the entity types that we have met so far are *Strong Entity Types*, meaning they do not depend on another entity type for its existence.

- ***Weak Entity Type***: An entity type that will depend on another entity type for its existence.

- Each entity occurrence cannot be uniquely identified using only the attributes associated with that entity type. A weak entity type does not exist on its own but must participate in a relationship with another (strong) entity type.

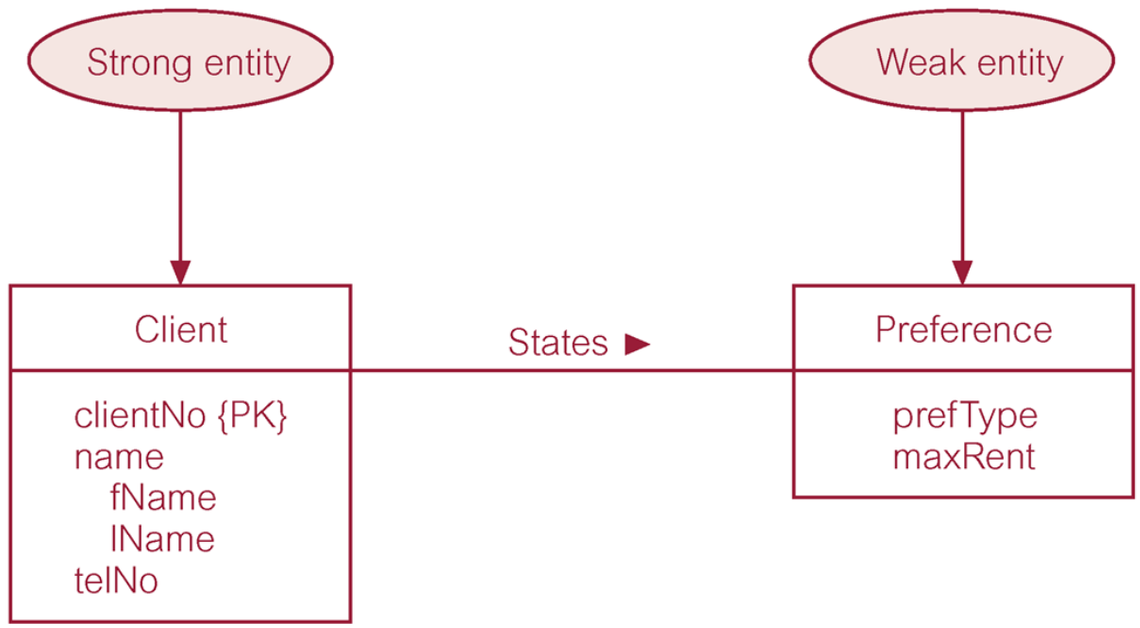
Weak Entity Types

- For instance, in a library system, a weak entity type would be *edition* as related to a *book* entity type; each *book* has several editions, and certainly we cannot speak about an edition if this does not happen in the context of a specific book. The *book* entity type is called the **owner** entity type or **identifying** entity type for the weak entity type *edition*.

- Another example would be *dependent* as related to an *Employee* entity type. An instance of a dependent would depend entirely on some instance of an employee or else the dependent would not be kept in the database. . The *employee* entity type is called the **owner/identifying** entity type for the weak entity type *dependent*.

Weak Entity Types
Modelling

- In this example, we have a *Client* entity type and a *Preference* entity type. A *Preference* entity cannot exist in its own right but must be related back to the owner/identifying entity type *(Client*).



- You model a weak entity type like a strong entity type except it has no Primary Key field.

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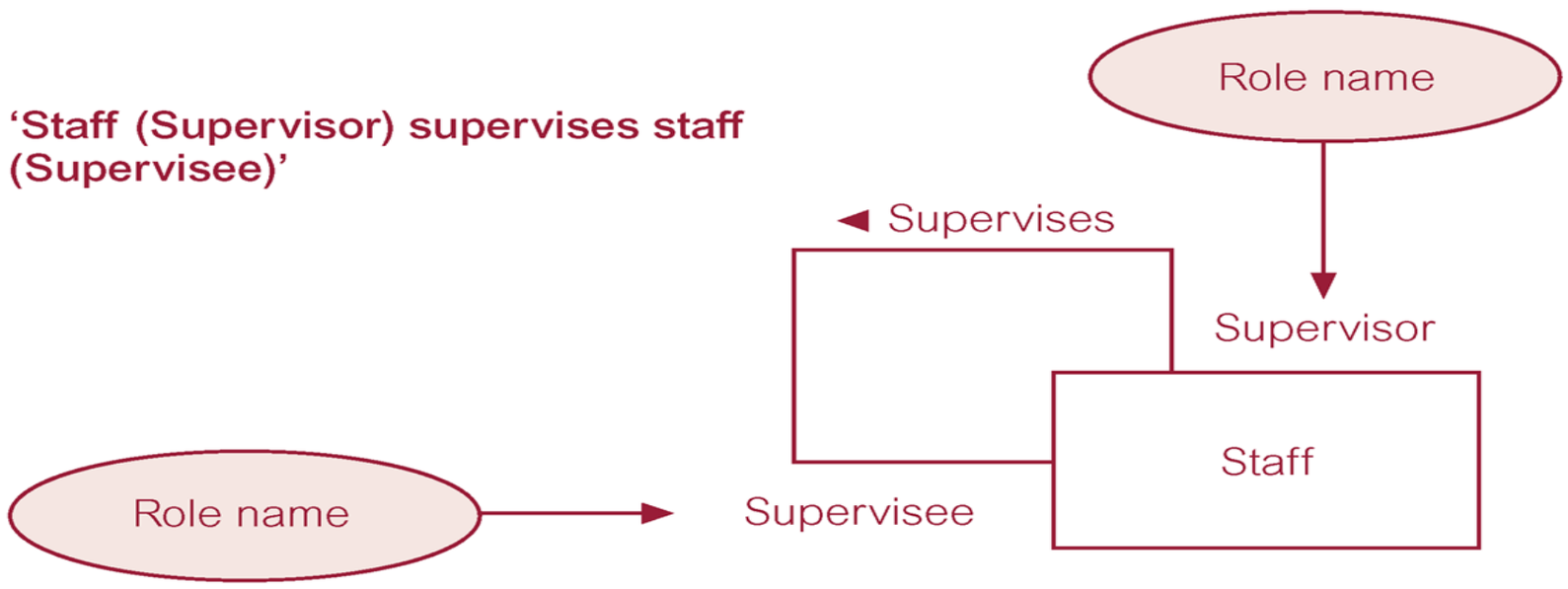
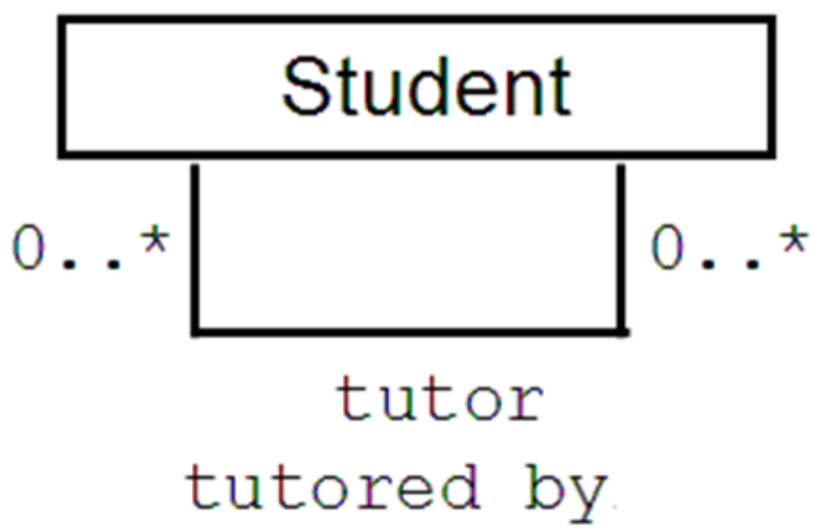
Recursive Relationships

- ***Recursive Relationship***: Relationship type where the *same* entity type participates more than once in *different* roles. Sometimes called *unary* relationships.



Recursive Relationships
Modelling

- As you can see from the previous Figure, to model a recursive relationship you draw a line to represent the relationship from one edge of the entity type to another edge of the same entity type.



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Multivalued Attributes

Modelling

- Recall that a multivalued attribute holds multiple values for each occurrence of an entity type.

- To model a multivalued attribute you write the attribute followed by square brackets [ ] and inside the square brackets you write down the min and max values.