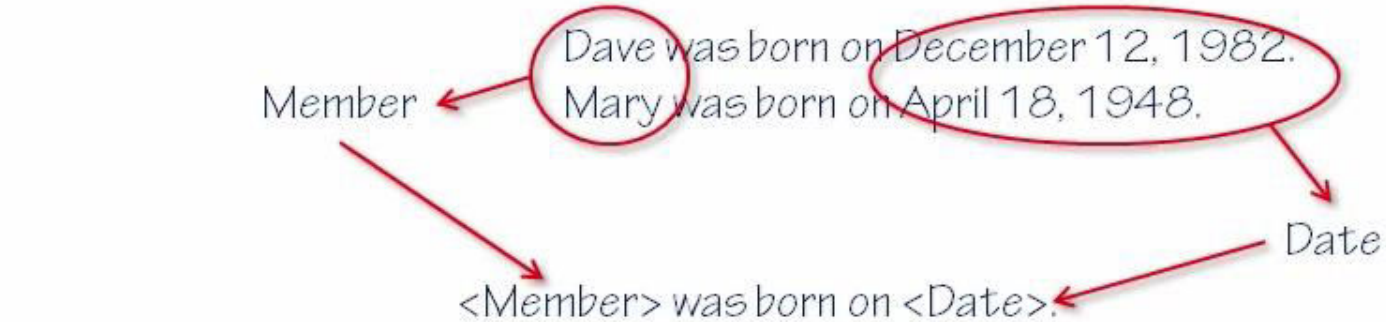
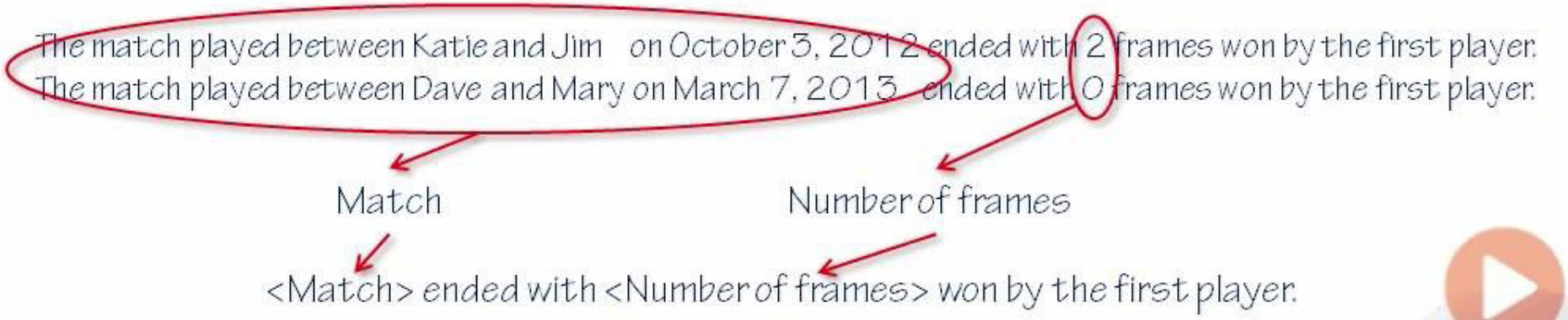
Outline

- **Fact types**
  - Template
  - Placeholders
  - Duplicates
- **Entity types**
  - Identifying fact type
- **Drawing the diagram**
  - Entity types
  - Attributes
  - Relationships
  - Artificial entity types

Generalizing fact types

- **To a higher abstraction layer**
  - From individual facts
  - To *fact types*.





Generalizing fact types

- **To a higher abstraction layer**
  - From individual facts
  - To *fact types*.

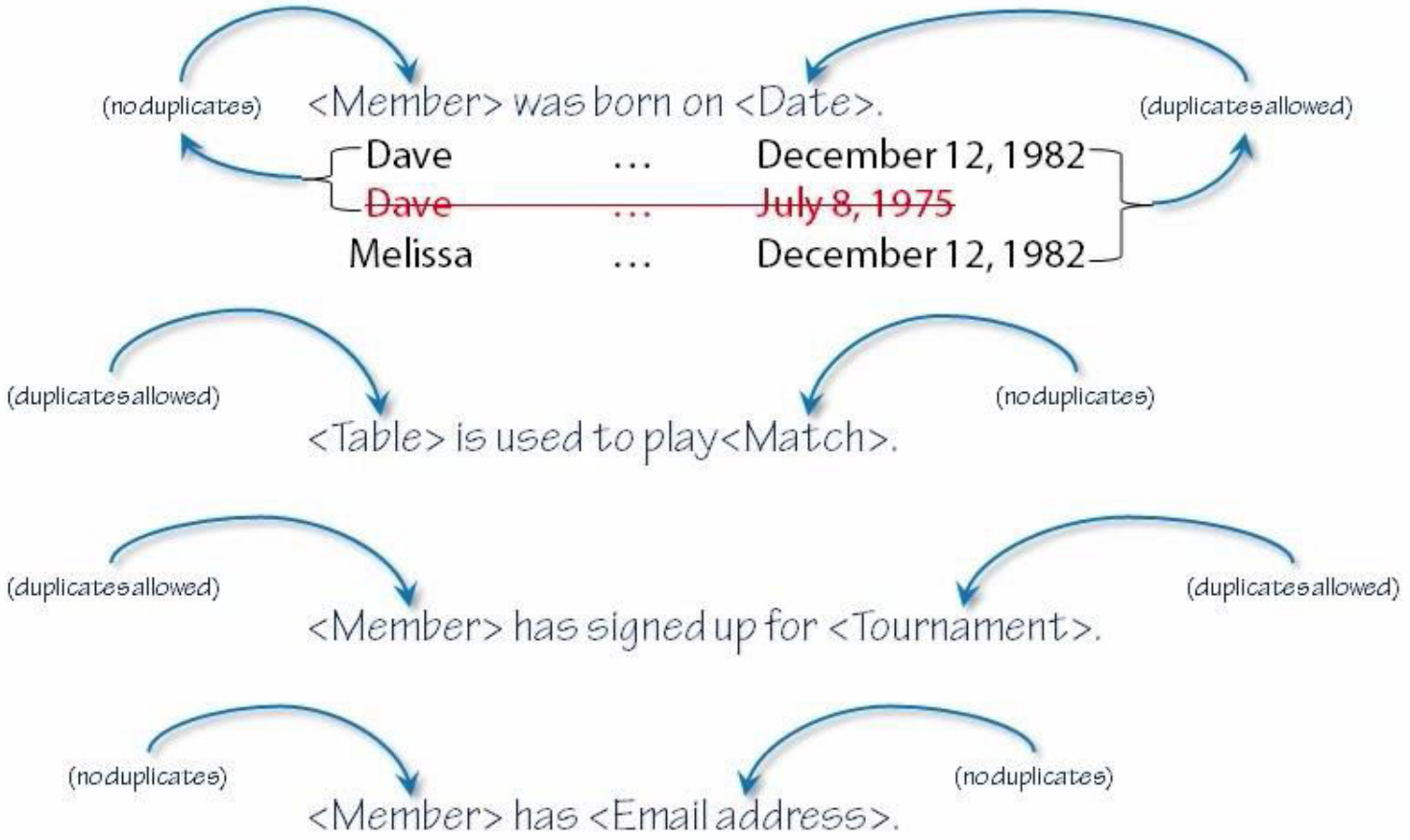
- **Templates can have any number of placeholders**

<Member> was born on <Date>.
<Match> ended with <Number of frames> won by the first player.
<Member> smokes.

<Pluralsight member> watched <course> on <device>.

Generalizing fact types

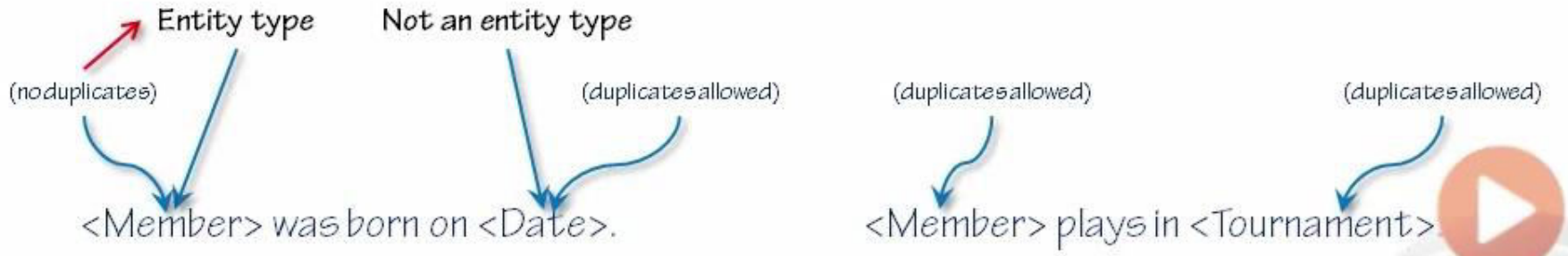
- **Finding where duplicates are allowed**
  - Only required (at this stage) for fact types with two placeholders



Finding entity types

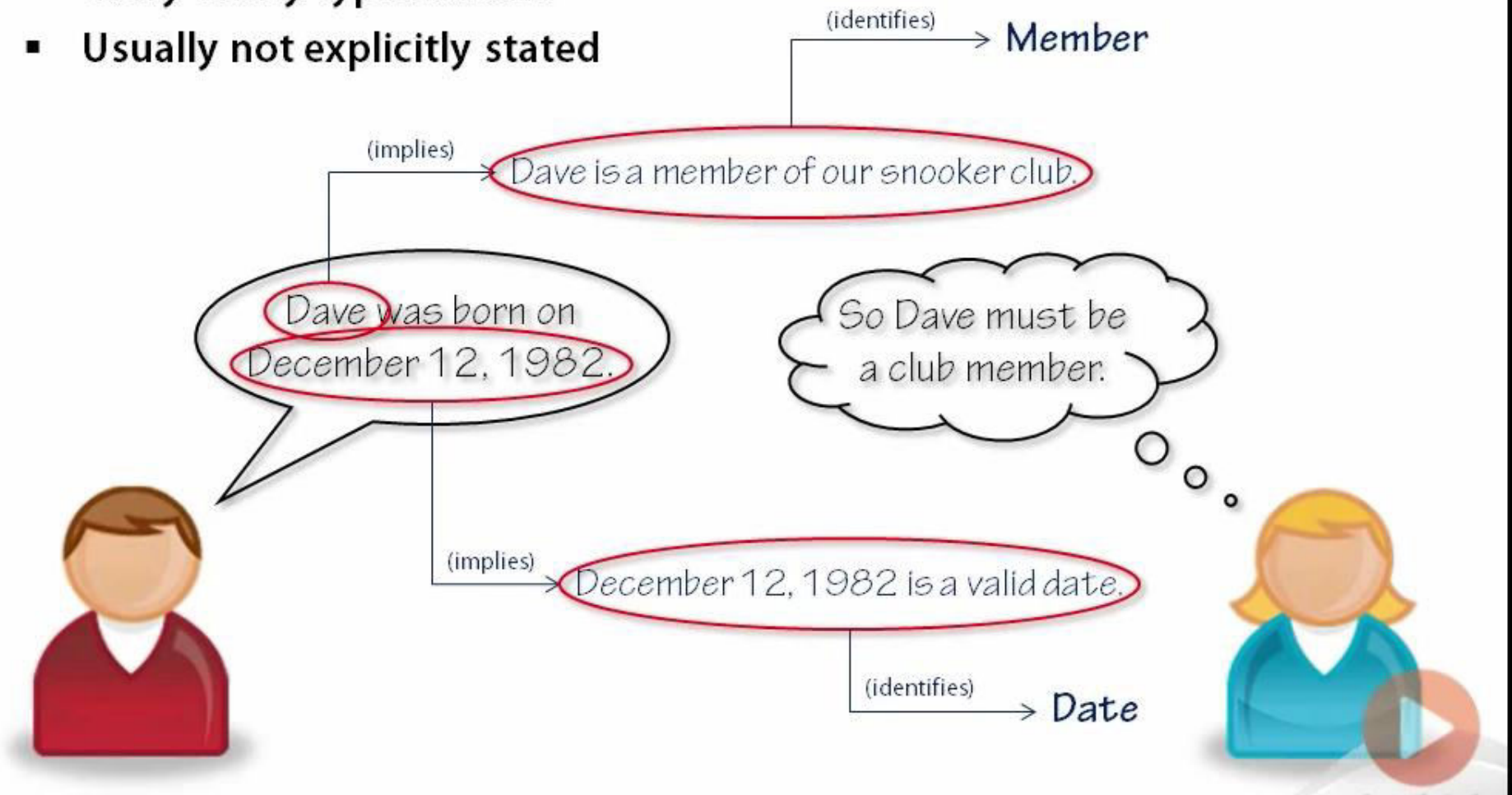
- **Representation of fact types**
  - Attribute of an **entity type**
  - Relationship between **entity types**

- **Indications for entity types**
  - Used in many fact types
    - **Probably** an entity type
  - Fact type with duplicates allowed in one placeholder, not allowed in other
    - Placeholder without duplicates **definitely** an entity type
    - No conclusive information from other fact types
  - Word order in fact type templates is **NOT** an indication!



Identifying fact types

- Identify entity occurrences
- Every entity type has one
- Usually not explicitly stated



Identifying fact types

- **Identify entity occurrences**
- **Every entity type has one**
- **Usually not explicitly stated**
  - Unless…
    - Someone *wants to* state it explicitly
    - Nothing other than existence of occurrence is known

Identifying fact types

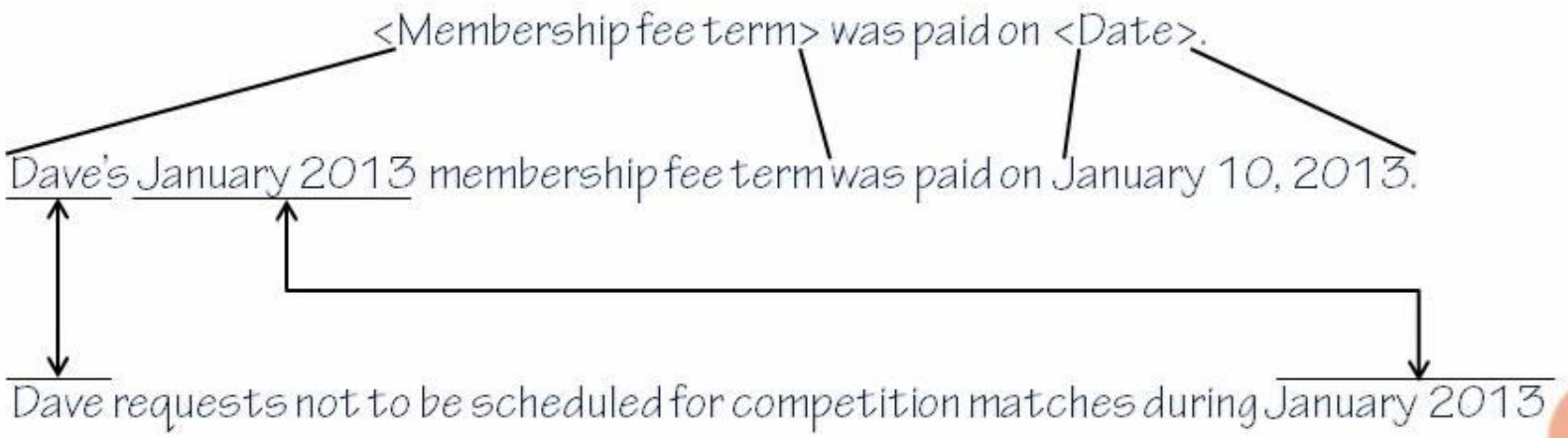
- **Recognizing identifying fact types**
  - One placeholder
    - Check meaning of facts

✓ <Name> is a member of our snooker club.

✗ <Member> smokes.

Identifying fact types

- **Recognizing identifying fact types**
  - One placeholder
    - Check meaning of facts
  - Two placeholders
    - Only if duplicates allowed for both
    - Placeholders must match identification of entity type
    - Check meaning of facts

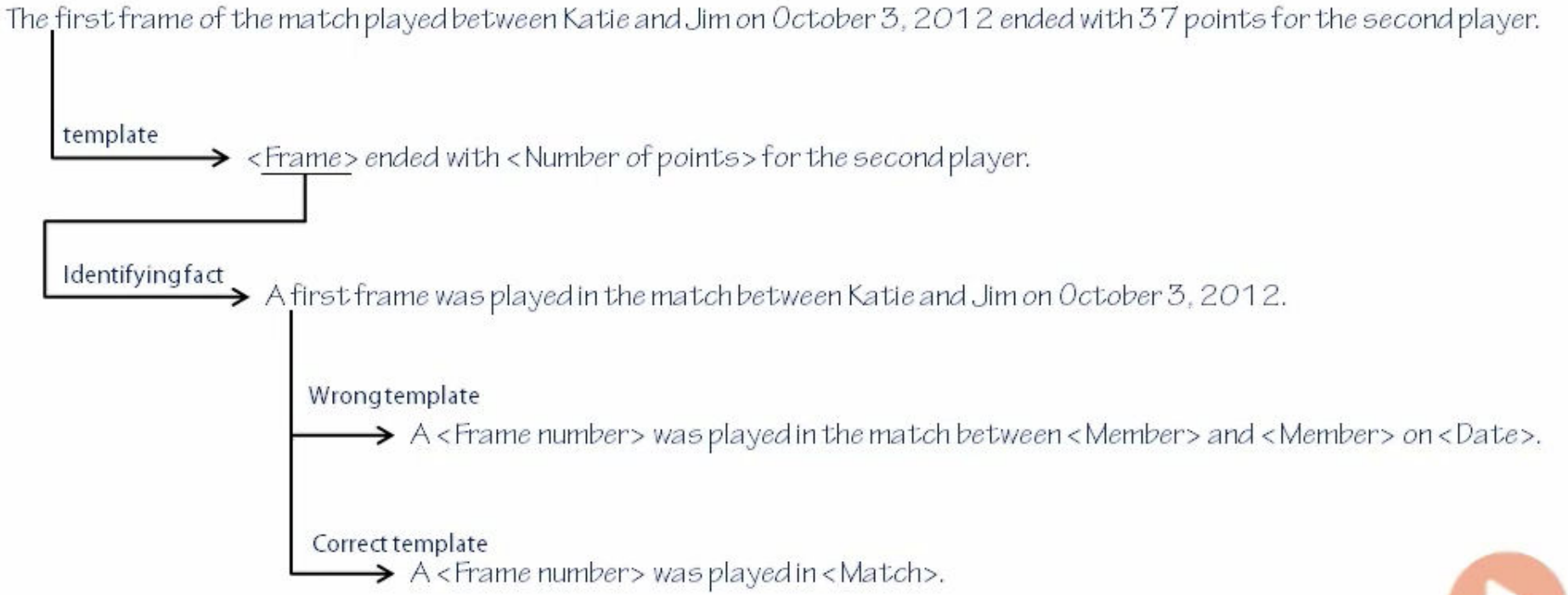


Identifying fact types

- **Recognizing identifying fact types**
  - One placeholder
    - Check meaning of facts
  - Two placeholders
    - Only if duplicates allowed for both
    - Placeholders must match identification of entity type
    - Check meaning of facts
  - Three or more placeholders
    - Placeholders must match identification of entity type
    - Check meaning of facts
- **Non-identifying fact types always reference *at least* one entity type**

Identifying fact types

- **Identifying fact types not explicitly stated**
  - (Optionally) add them with your own reading
  - (Definitely) analyze their structure



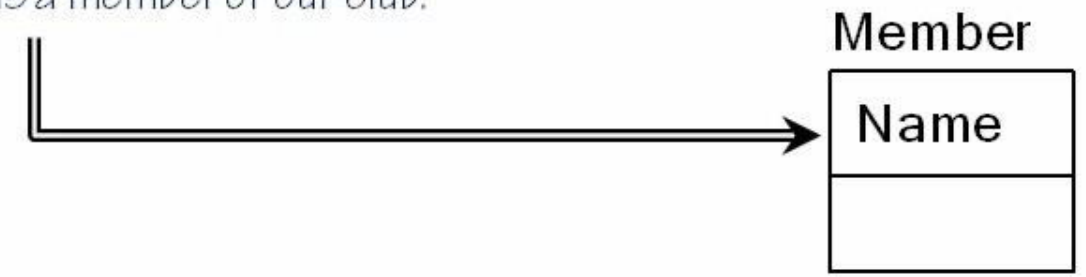
Entity types

- **Diagram**
  - Layout may change
- **Check all entity types**
  - Identifying fact type references one or more other entity types? → Weak
  - Identifying fact type does not reference other entity types? → Strong

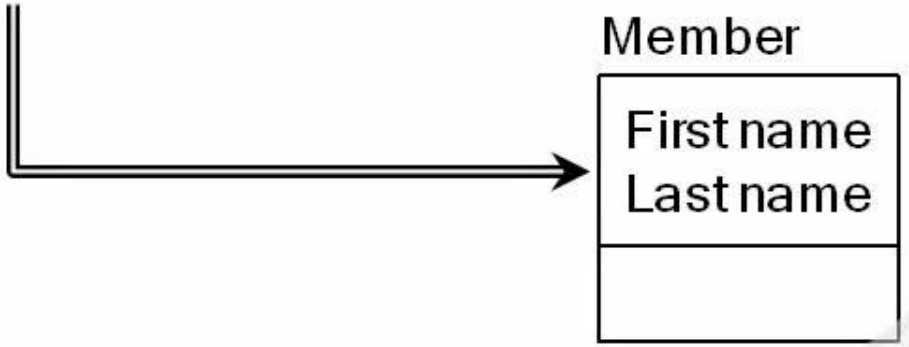
Entity types

- **Strong entity types**
  - All placeholders become key attributes

Entity type: Member
Template: "<Name> is a member of our club."



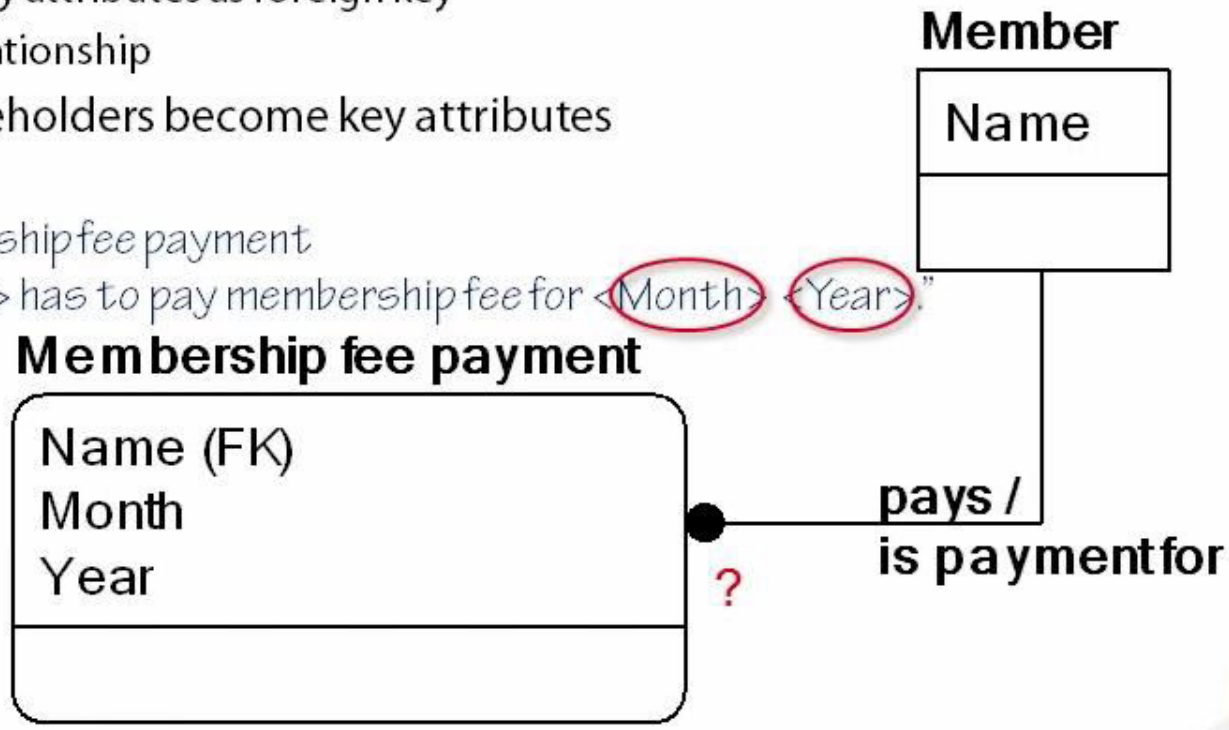
Template: "<First name> <Last name> is a member of our club."



Entity types

- **Strong entity types**
  - All placeholders become key attributes
- **Weak entity types**
  - Placeholders referencing entity type
    - Copy key attributes as foreign key
    - Add relationship
  - Other placeholders become key attributes

Entity type: Membership fee payment
Template: "<Member> has to pay membership fee for <Month> <Year>."



Entity types

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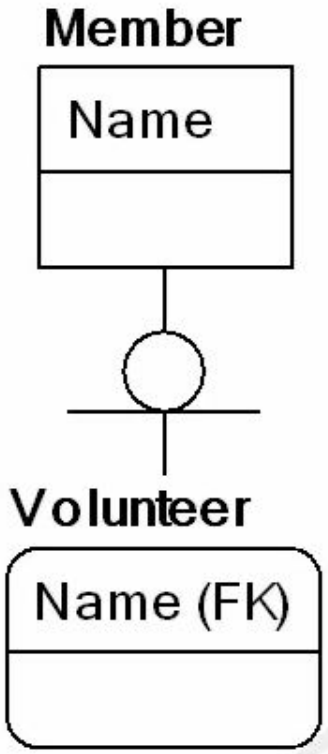
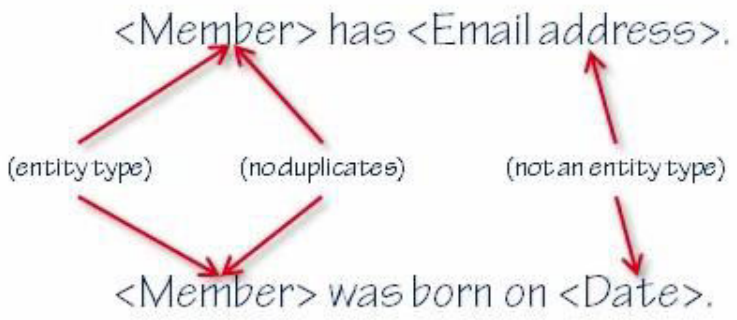
  - All placeholders become key attributes
- **Weak entity types**
  - Placeholders referencing entity type
    - Copy key attributes as foreign key
    - Add relationship
  - Other placeholders become key attributes
- **Subtypes**
  - Weak entity types with single placeholder
  - Identifying relationship is **one** to **zero or one**
  - Multiple subtypes → mutual relationship
    - Nested subtypes
    - Mutually exclusive → complete or incomplete?
    - Independent

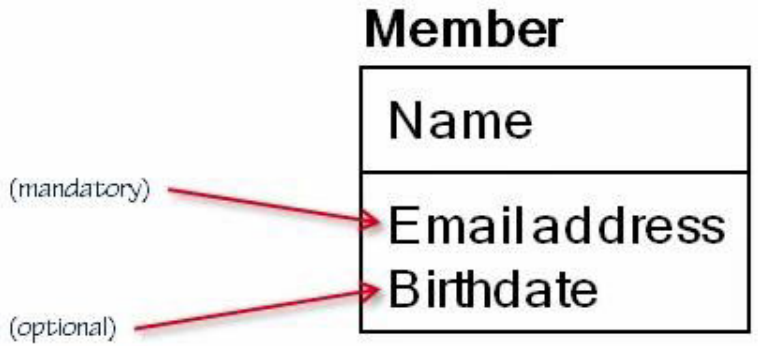


Attributes

- **Fact types with two placeholders in template**
  - One referencing entity type and not allowing duplicates
  - Other one not referencing entity type

- **Optionality:**
  - Mandatory – fact must be known for each instance
  - Optional – fact may be missing for some instances





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  - Not represented in IDEF1X, still important!
    - Homebrew notation

Attributes

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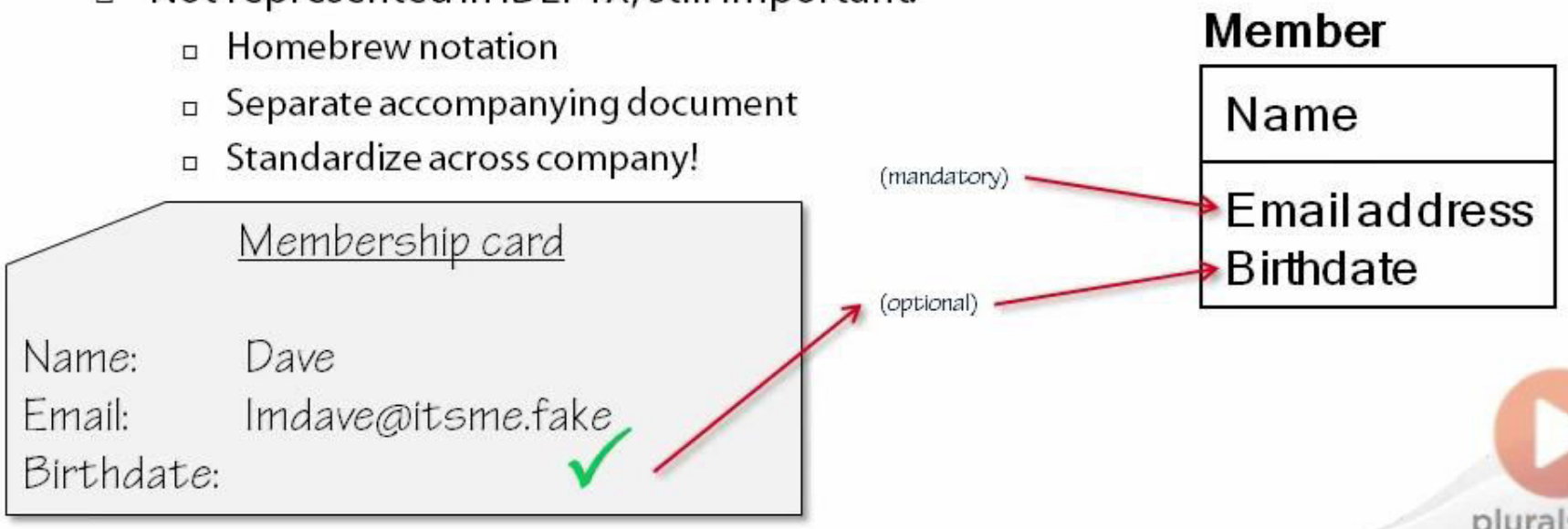
  - Optional – fact may be missing for some instances
  - Not represented in IDEF1X, still important!
    - Homebrew notation
    - Separate accompanying document
    - Standardize across company!



Attributes

- **Fact types with one placeholder in template**
  - Except identifying fact types
- **Pure form**
  - Optional attribute
  - Only "true" allowed
- **Alternative**
  - Mandatory attribute
  - "True" or "false"

Name	Email address	Birthdate	Smoker
Dave	Imdave@itsme.fake		True
Angie	Angie@nowhere.not	7/3/1957	False

We know that Dave smokes

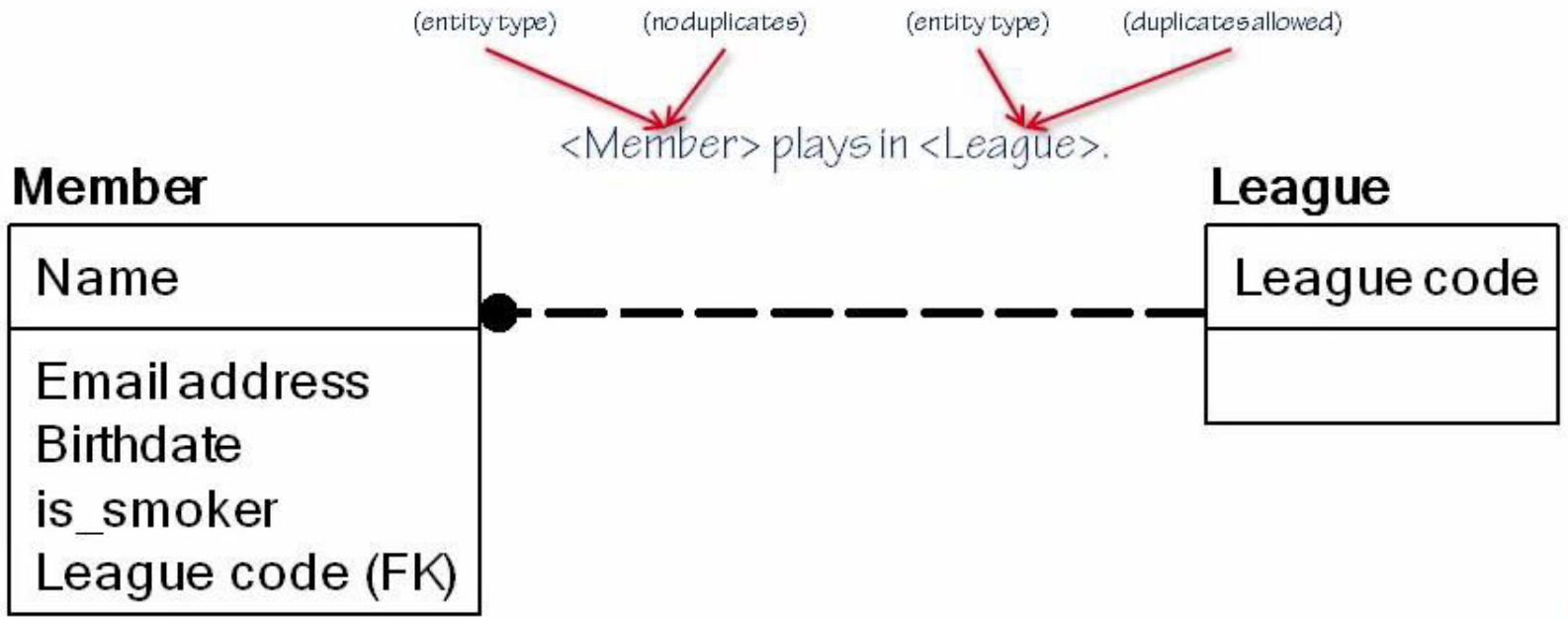
We know that Angie doesn't smoke

Member

Name
Email address Birthdate is_smoker

Relationships

- **Fact types with two placeholders in template**
  - Both referencing an entity type
  - One-to-many, many-to-many, one-to-one: based on duplicates in facts



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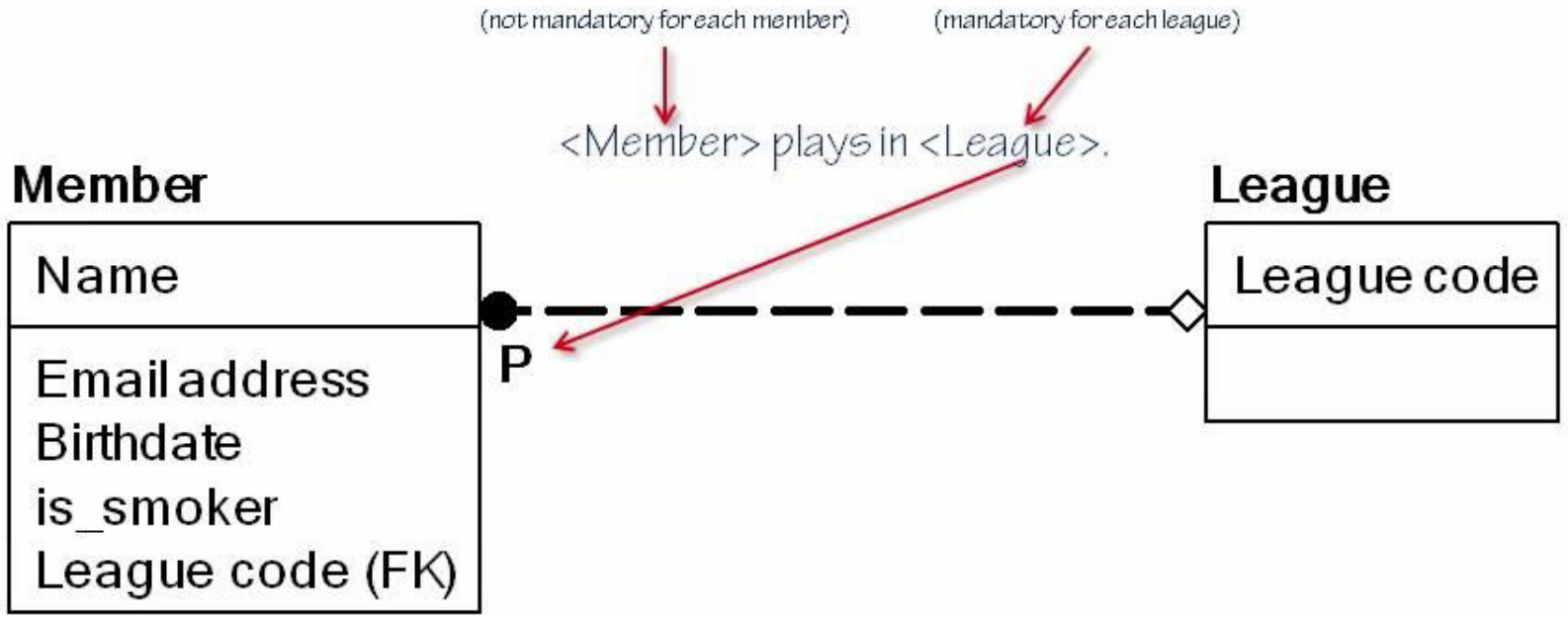

Relationships

- **Fact types with two placeholders in template**
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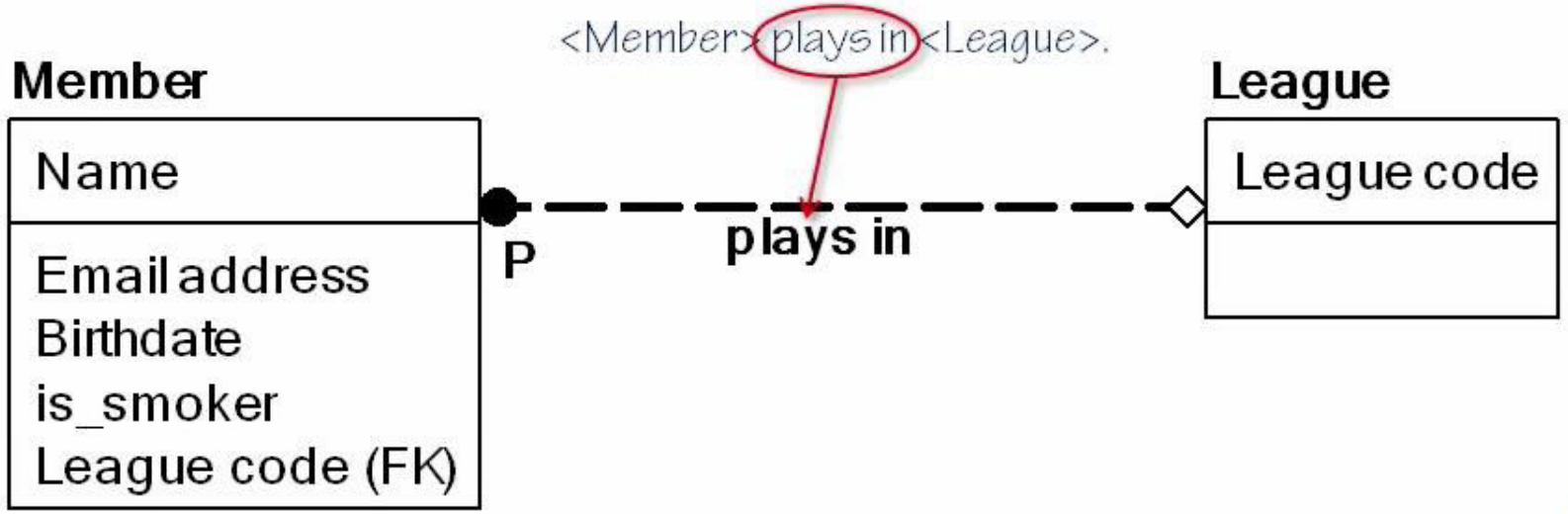
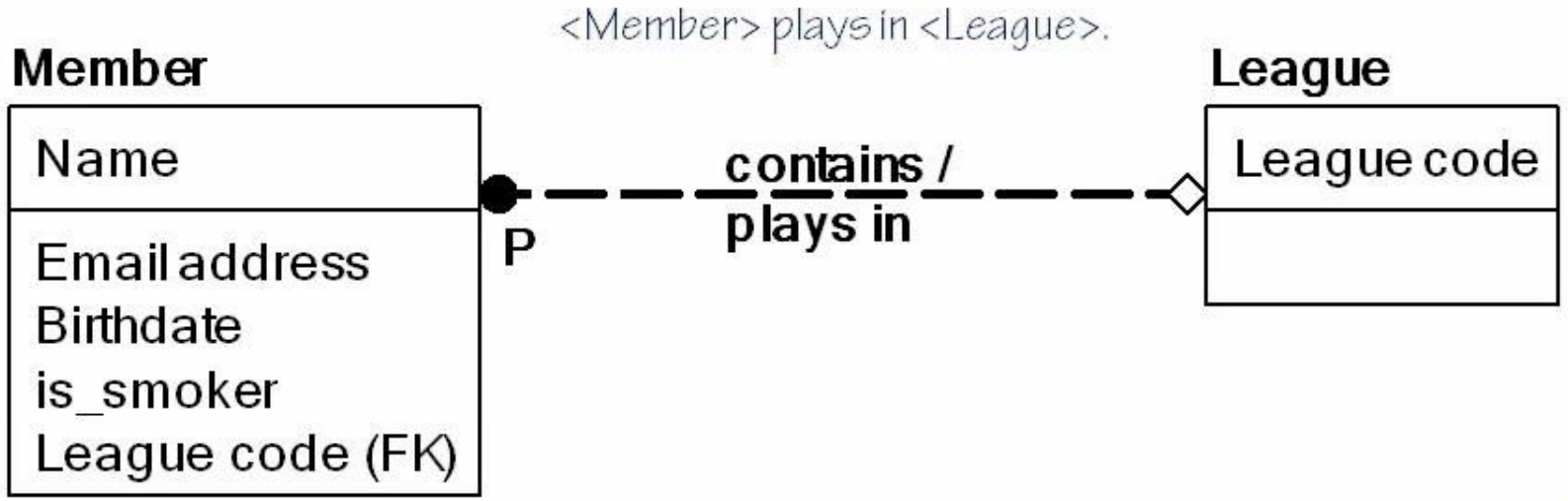
  - First relationship reading from template



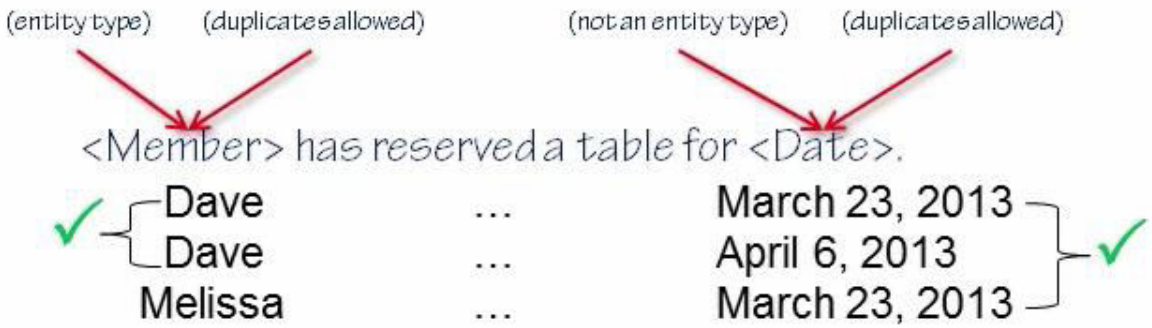
Relationships

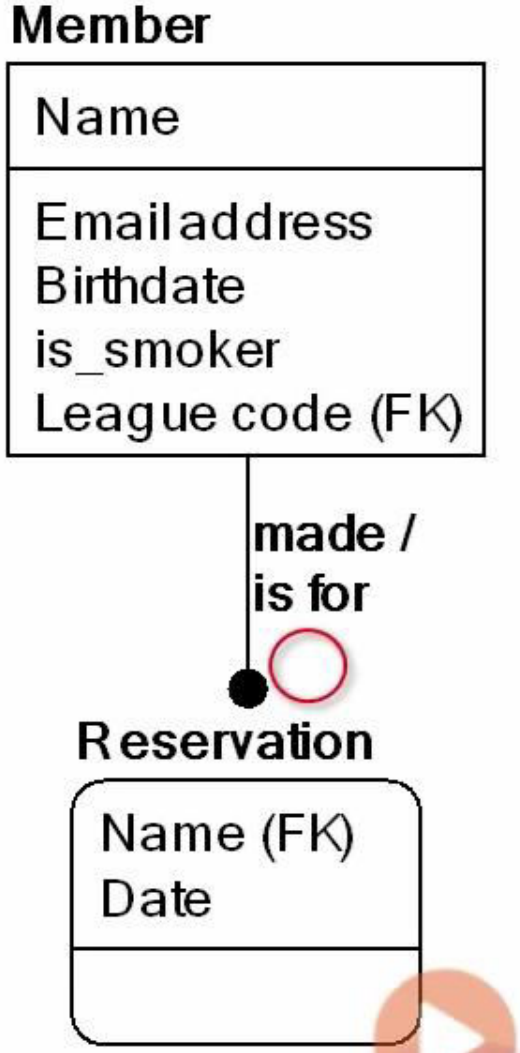
- **Fact types with two placeholders in template**
  - Both referencing an entity type
  - One-to-many, many-to-many, one-to-one: based on duplicates in facts
  - First relationship reading from template
  - Second relationship reading: DIY or consult subject matter expert



Artificial entity types

- **Fact types not yet represented in the diagram**
  - Three or more placeholders
  - Two placeholders
    - One referencing entity type and allowing duplicates
    - Other one not referencing entity type
- **Multi-valued attribute**
  - Not supported in IDEF1X diagrams
  - Workaround: nominalize
    - Make entity type out of fact type

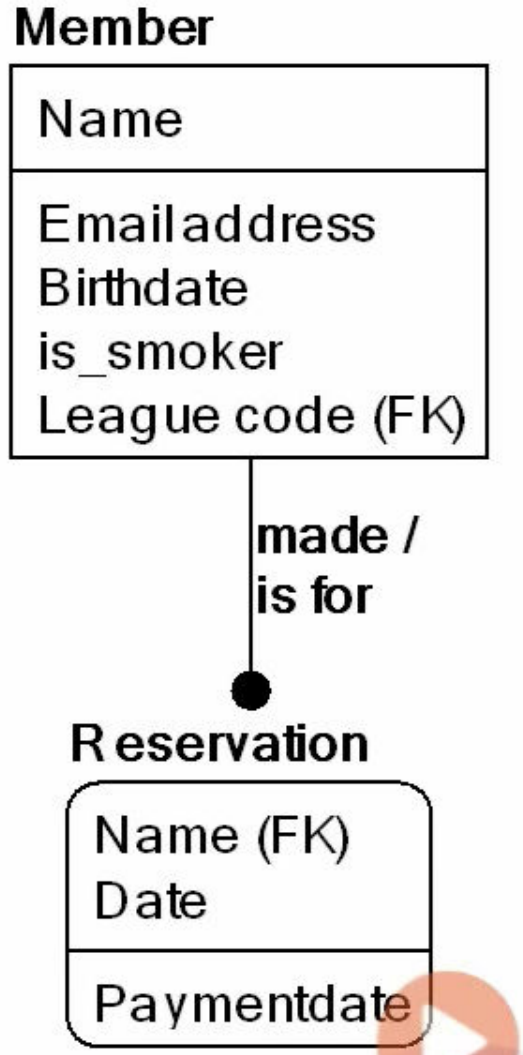




Artificial entity types

- **Artificial or not artificial?**
  - Depends…

<Reservation> was paid on <Date>.



Artificial entity types

- **Fact types not yet represented in the diagram**
  - Two placeholders
    - One referencing entity type and allowing duplicates
    - Other one not referencing entity type
  - Three or more placeholders
    - Relationship between more than two entity types
    - Relationship with its own attribute
    - Composite multivalued attribute
- **Not supported in IDEF1X diagrams**
  - Workaround: nominalize