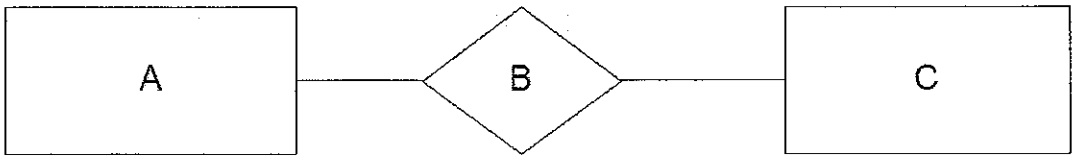
Structural constraints on binary relationships – standard approach



Cardinality ratios of B – choose which holds:

1) Some entities of A can be related to more than one in C.

2) No entity of A can be related to more than one in C.

In the first case, label the arc between B and C with N.
In the second case, label it with 1.

Label the arc between A and B using the same technique. Depending on how the labels are made, classify B as 1:1 or N:1 or 1:N or M:N from A to C.

Participation constraints – choose which one holds.

1) Each entity of A must be related by B to at least one in C.

2) There could be entities in A unrelated by B to anything in C.

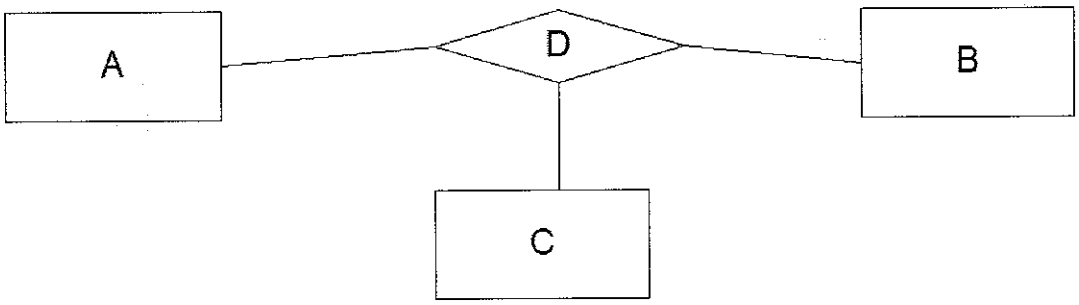
In the first case, double the arc between A and B, and classify B as **total** (or **mandatory**) on A. In the second case, leave the arc undoubled, and say that B is **partial** (or **optional**) on A.

Treat the arc between B and C similarly.

Note

The cardinality ratio here uses the "look across" approach (the arc between A and B considers a typical C entity). The participation constraint uses the "look here" approach (the arc between A and B tells about A). Other approaches (like UML) use a pure "look across" approach. Still others ("Merise") use a pure "look here" approach.

Structural constraints on ternary relationships – standard approach



Here we see that D is a ternary relationship on entity types A, B, and C.

Cardinality ratios of D

Here's how we label the arc between A and D (the other three work similarly): Consider a typical pair of entities b from B and c from C. If that pair can be related by D to more than one entity in A, then label the arc with N. If it is restricted to a single entity, then label it with 1. Thus it's still a "look across" approach.

There are eight possible classifications of D: 1:1:1, 1:1:N, ..., M:N:1, M:N:P.

Participation constraints

These are done like the binary case ("look here").

Note

UML and Merise approaches also extend from the binary to the n-ary situation.