Some Simple ER Crowsfoot Examples

Attempting to illustrate all possible relationship types.

**example 1** boat:sailor is one-to-many

A boat has many sailors assigned to it. Every sailor is assigned to just one boat. No sailor can be unassigned (boat_id cannot be NULL).

**example 2** boat:sailor is one-to-many optional

A boat has many sailors assigned to it. Every sailor is assigned at most one boat. A sailor may be assigned to no boat (boat_id can be NULL).
example 3 boat:sailor is many-to-one

A sailor may be assigned to many boats. A boat has at most one sailor assigned to it. Every boat must have a sailor assigned to it (sailor_num cannot be NULL).

example 4 boat:sailor is many-to-one optional

A sailor may be assigned to many boats. A boat has at most one sailor assigned to it. A boat need not have a sailor assigned to it (sailor_num can be NULL).
**example 5** boat:sailor is one-to-one optional

A sailor may be assigned to at most one boat. A boat has at most one sailor assigned to it. A boat need not have a sailor assigned to it (sailor_num can be NULL).

**example 6** boat:sailor is many-to-many (non-specific)

A boat may be assigned many sailors, and a sailor may be assigned to many boats. This uses a non-specific relationship, and no foreign keys are created.

**example 7** boat:sailor is many-to-many (with bridge entity)
Same situation as the previous example, but with a weak entity representing the many-to-many relationship. Note how the identifying relationships place the key of one table (SAILOR or BOAT) into the key of the identified entity (ASSIGN).