Module 7 Exercise Problems

Most of these problems are covered in the video lessons in Module 7 and associated slides. The full solutions are given for all problems in a document in the module 7 part of the website.

1. Draw an ERD containing the *Order* and *Customer* entity types connected by a 1-M relationship from *Customer* to *Order*. Choose an appropriate relationship name using your common knowledge of interactions between customers and orders. Define minimum cardinalities so that an order is optional for a customer and a customer is mandatory for an order. For the *Customer* entity type, add attributes *CustNo* (primary key), *CustFirstName*, *CustLastName*, *CustStreet*, *CustCity*, *CustState*, *CustZip*, and *CustBal* (balance). For the *Order* entity type, add attributes for the *OrdNo* (primary key), *OrdDate*, *OrdName*, *OrdStreet*, *OrdCity*, *OrdState*, and *OrdZip*. If you are using a data modeling tool that supports data type specification, choose appropriate data types for the attributes based on your common knowledge.

2. Extend the ERD from problem 1 with the *Employee* entity type and a 1-M relationship from *Employee* to *Order*. Choose an appropriate relationship name using your common knowledge of interactions between employees and orders. Define minimum cardinalities so that an employee is optional to an order and an order is optional to an employee. For the *Employee* entity type, add attributes *EmpNo* (primary key), *EmpFirstName*, *EmpLastName*, *EmpPhone*, *EmpEmail*, *EmpCommRate* (commission rate), and *EmpDeptName*. If you are using a data modeling tool that supports data type specification, choose appropriate data types for the attributes based on your common knowledge.

3. Extend the ERD from problem 2 with a self-referencing 1-M relationship involving the *Employee* entity type. Choose an appropriate relationship name using your common knowledge of organizational relationships among employees. Define minimum cardinalities so that the relationship is optional in both directions.

4. Extend the ERD from problem 3 with the *Product* entity type and an M-N relationship between *Product* and *Order*. Choose an appropriate relationship name using your common knowledge of connections between products and orders. Define minimum cardinalities so that an order is optional to a product, and a product is mandatory to an order. For the *Product* entity type, add attributes *ProdNo* (primary key), *ProdName*, *ProdQOH*, *ProdPrice*, and *ProdNextShipDate*. For the M-N relationship, add an attribute for the order quantity. If you are using a data modeling tool that supports data type specification, choose appropriate data types for the attributes based on your common knowledge.

5. Revise the ERD from problem 4 by transforming the M-N relationship into an associative entity type and two identifying, 1-M relationships.

6. Using your ERD from problem 5, add violations of consistency rules for identification dependency (weak entity type rule, identifying relationship rule, and identification dependency cardinality rule) and redundant foreign keys (1 rule).

7. For each diagram error in Figure P7, identify the diagram rule violated and suggest possible resolutions of the error. The ERD has generic names so that you will concentrate on finding diagram errors rather than focusing on the meaning of the diagram.

Entity2

Attrbute2-1
Attribute2-2
Attribute2-3
Attribute2-4

Entity3

Attribute3-1
Attribute3-2
Attribute3-3

Rel2

Rel3

Entity4

Attribute4-1
Attribute4-2
Attribute4-3
Attribute4-4
Attribute4-5
Attribute4-6
Attribute4-7

Rel1

Entity5

Attribute5-1
Attribute5-2
Attribute5-3
Attribute5-4
Attribute4-1
Attribute4-7

Rel4

Entity6

Attribute6-1
Attribute6-2
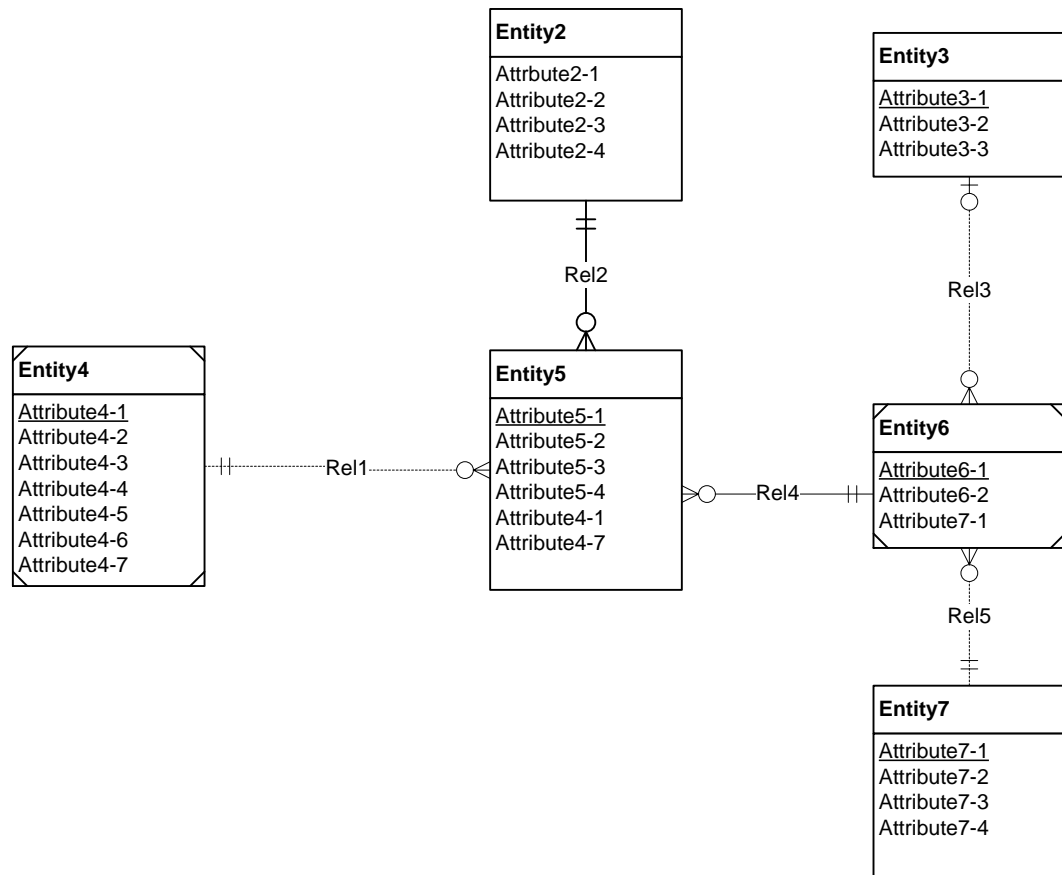Attribute7-1

Rel5

Entity7

Attribute7-1
Attribute7-2
Attribute7-3
Attribute7-4

Figure P7: ERD for Problem 7