Schema Conversion Assignment

1. Convert the ERD shown in Figure 1 into tables. List the conversion rules used and the resulting tables with primary keys, foreign keys, other columns, and not null constraints for foreign keys. You do not need to provide CREATE TABLE statements.

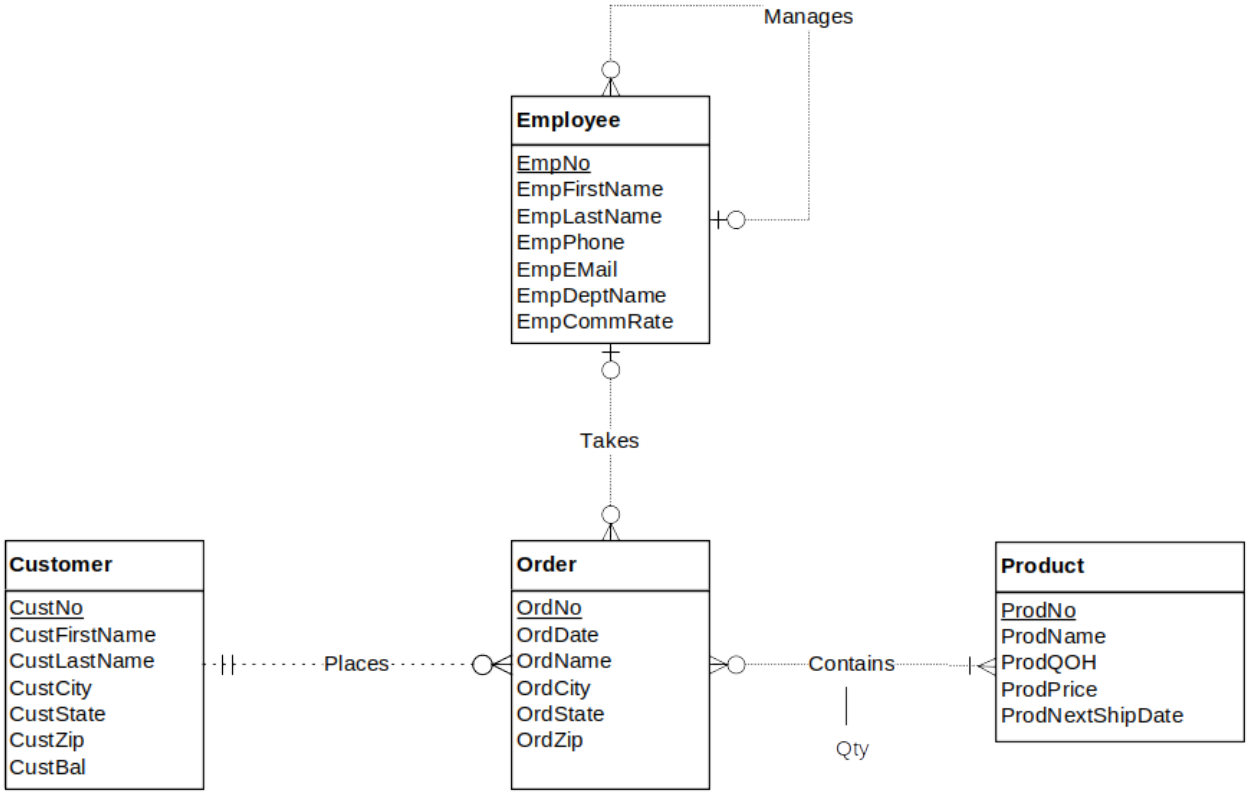

Figure 1: ERD for Problem 1

Solution:

Customer(CustNo, CustFirstName, CustLastName, CustCity, CustState, CustZip, CustBal)

Employee(EmpNo, *SupEmpNo*, EmpFirstName, EmpLastName, EmpPhone, EmpEmail, EmpDeptName, EmpCommRate) FOREIGN KEY(SupEmpNo) REFERENCES Employee

Product(ProdNo, ProdName, ProdQOH, ProdPrice, ProdNextShipDate)

Order(<u>OrdNo</u>, *CustNo*, *EmpNo*, OrdDate, OrdName, OrdCity, OrdZip)

FOREIGN KEY(custno) REFERENCES customer

FOREIGN KEY(empno) REFERENCES employee

CustNo NOT NULL Contains(<u>*OrdNo*</u>, <u>*ProdNo*</u>, Qty)

FOREIGN KEY(ordno) REFERENCES order

FOREIGN KEY(prodno) REFERENCES product

Conversion rules

- Use the entity type rule to convert each entity type
- Use the 1-M relationship rule for all relationships except the *contains* relationship
- Use the M-N rule to convert the *contains* relationship

2. Convert the ERD shown in Figure 2 into tables. This ERD is identical to problem 1 except for the use of an associative entity type instead of the M-N relationship. You only need to indicate the conversion rules and table design for the associative entity type.

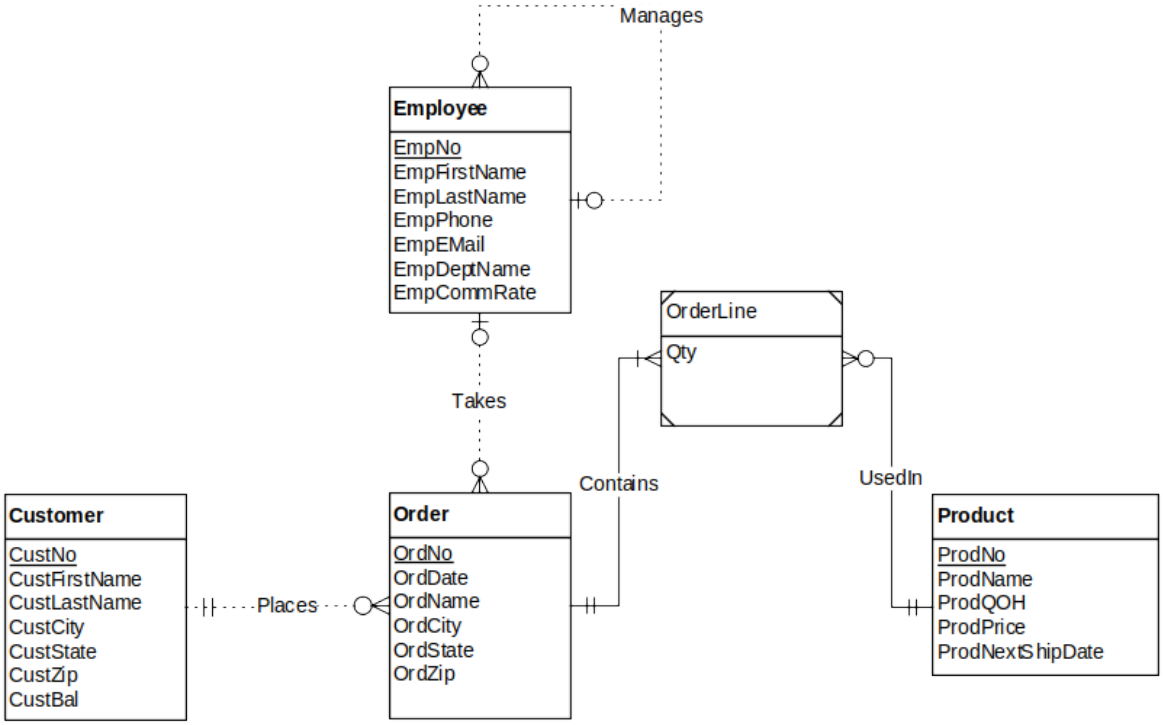

Figure 2: ERD for Problem 2

Solution:

Customer(CustNo, CustFirstName, CustLastName, CustCity, CustState, CustZip, CustBal)

Employee(EmpNo, *SupEmpNo*, EmpFirstName, EmpLastName, EmpPhone, EmpEmail, EmpDeptName, EmpCommRate)

FOREIGN KEY(SupEmpNo) REFERENCES Employee

Product(ProdNo, ProdName, ProdQOH, ProdPrice, ProdNextShipDate)

Order(OrdNo, *CustNo*, *EmpNo*, OrdDate, OrdName, OrdCity, OrdZip)

FOREIGN KEY(custno) REFERENCES customer

FOREIGN KEY(empno) REFERENCES employee

CustNo NOT NULL

OrderLine(*OrdNo*, *ProdNo*, Qty)

FOREIGN KEY(ordno) REFERENCES order

FOREIGN KEY(prodno) REFERENCES product

Conversion rules

- Use the entity type rule to convert each entity type
- Use the 1-M relationship rule for all relationships
- Use the identification dependency rule to add two components (OrdNo and ProdNo) to the primary key of the OrderLine table

3. Convert the ERD shown in Figure 4 into tables. List the conversion rules used and the resulting tables with primary keys, foreign keys, other columns, and not null constraints for foreign keys. You do not need to provide CREATE TABLE statements.

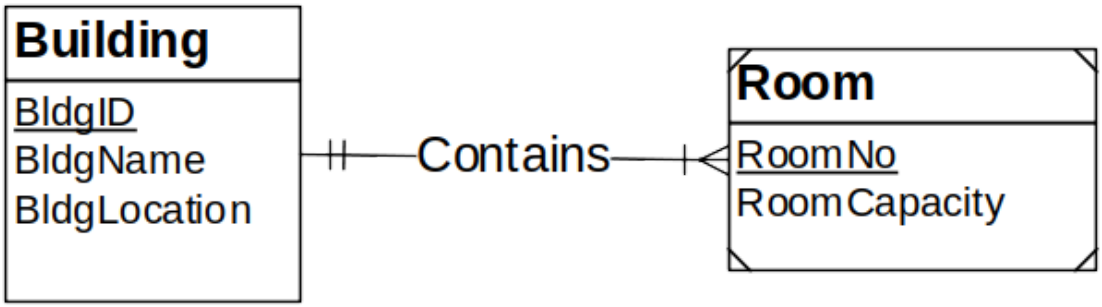

Figure 4: ERD for Problem 4

Solution:

Building(BldgId, BldgName, BldgLocation)

Room(*BldgId*, RoomNo, RoomCapacity)

FOREIGN KEY(BldgId) REFERENCES Building

Conversion rules

- Use the entity type rule to convert the Building and Room entity types.
- Use the 1-M relationship rule to convert the Contains relationship into the BldgId FK in the Room table.
- Use the identification dependency rule to make BldgId a component of the PK of Room. The PK of the Room table is a combination of BldgId and RoomNo.
- In the final conversion result, a not null constraint is not needed for Room.BldgId because this column is part of the primary key of Room.