# Assignment for Module 10

The assignment for Module 10 involves problems for schema conversion. Problems 1 to 4 involve the ERD in Figure 1.



Figure 1: ERD for Problems 1 to 4

1. For the ERD in Figure 1, you should indicate the applications of the entity type rule. For each entity type rule application, you should **identify the table name, primary key, and other columns**. You do not need to write CREATE TABLE statements.

**SOLUTION 1:**

**Use the entity type rule to convert each entity type in figure 1**

Institution(InstID, InstName, InstMascot)

Student(StdNo, StdName, StdAddress, StdCity, StdState, StdZip, StdEmail)

Lender(LendNo, LendName)

Loan(LoanNo, *InstID*, *StdNo*, *LenderNo*, ProcDate, DisbMethod, DateAuth, NoteValue, Subsidized, Rate)

DisburseLine(DateSent, *LoanNo*, Amount, OrigFee, GuarFee)

1. For the ERD in Figure 1, you should indicate applications of the 1-M relationship rule. For each 1-M relationship rule application, you should indicate the changes to the tables you listed in problem 1 including foreign key columns and NOT NULL constraints for foreign keys if necessary.

**SOLUTION 2:**

**Use the 1-M relationship rule for all relationships (add FK in child tables for 1-M)**

Institution(InstID, InstName, InstMascot)

Student(StdNo, StdName, StdAddress, StdCity, StdState, StdZip, StdEmail)

Lender(LendNo, LendName)

Loan(LoanNo, *InstID*, *StdNo*, *LenderNo*, ProcDate, DisbMethod, DateAuth, NoteValue, Subsidized, Rate)

FOREIGN KEY(InstID) REFERENCES Institution

FOREIGN KEY(StdNo) REFERENCES Student

FOREIGN KEY (LenderNo) REFERENCES Lender

InstID NOT NULL

StdNo NOT NULL

LenderNo NOT NULL

DisburseLine(DateSent, *LoanNo*, Amount, OrigFee, GuarFee)

FOREIGN KEY(LoanNo) REFERENCES Loan

LoanNo NOT NULL

1. For the ERD in Figure 1, you should indicate applications of the M-N relationship rule. For each M-N relationship rule application, you should list the table name, primary key, and other columns.

**SOLUTION 3:**

**Use the M-N rule to convert relationships (add associative tables plus FKs, combined PK)**

no changes

Institution(InstID, InstName, InstMascot)

Student(StdNo, StdName, StdAddress, StdCity, StdState, StdZip, StdEmail)

Lender(LendNo, LendName)

Loan(LoanNo, *InstID*, *StdNo*, *LenderNo*, ProcDate, DisbMethod, DateAuth, NoteValue, Subsidized, Rate)

FOREIGN KEY(InstID) REFERENCES Institution

FOREIGN KEY(StdNo) REFERENCES Student

FOREIGN KEY (LenderNo) REFERENCES Lender

InstID NOT NULL

StdNo NOT NULL

LenderNo NOT NULL

DisburseLine(DateSent, *LoanNo*, Amount, OrigFee, GuarFee)

FOREIGN KEY(LoanNo) REFERENCES Loan

LoanNo NOT NULL

1. For the ERD in Figure 1, you should indicate applications of the identifying relationship rule. For each identifying relationship rule application, you should indicate the changes to the tables you listed in problem 2.

**SOLUTION 4:**

**Use the identification dependency rule to add LoanNo to the primary key of the DisburseLine table**

Institution(InstID, InstName, InstMascot)

Student(StdNo, StdName, StdAddress, StdCity, StdState, StdZip, StdEmail)

Lender(LendNo, LendName)

Loan(LoanNo, *InstID*, *StdNo*, *LenderNo*, ProcDate, DisbMethod, DateAuth, NoteValue, Subsidized, Rate)

FOREIGN KEY(InstID) REFERENCES Institution

FOREIGN KEY(StdNo) REFERENCES Student

FOREIGN KEY (LenderNo) REFERENCES Lender

InstID NOT NULL

StdNo NOT NULL

LenderNo NOT NULL

DisburseLine(DateSent, *LoanNo*, Amount, OrigFee, GuarFee)

FOREIGN KEY(LoanNo) REFERENCES Loan

LoanNo NOT NULL

1. Convert the ERD shown in Figure 2 into tables. List the conversion rules used and table design. For each table, you should list the primary key, foreign keys, other columns, and NOT NULL constraints for foreign keys if necessary. You do not need to write CREATE TABLE statements.



Figure 2: ERD for Conversion Problem 5

**SOLUTION 5:**

Use the entity type rule to convert each entity type

Use 1-M relationship rule on relationship (Fks in table)

Account(Acctid, *Decomacctid*, AcctName, Balance)

FOREIGN KEY(Decomacctid) REFERENCES Account

1. Convert the ERD shown in Figure 3 into tables. List the conversion rules used and table design. For each table, you should list the primary key, foreign keys, other columns, and NOT NULL constraints for foreign keys if necessary. You do not need to write CREATE TABLE statements.



Figure 3: ERD for Conversion Problem 6

**SOLUTION 6:**

Use the entity type rule to convert each entity type

Use M-N relationship rule to convert the shares relationship

Owner(OwnerId, OwnName, OwnPhone)

Property(PropId, BldgName, UnitNo, Bdrms)

Shares(*OwnerId*, *PropId,* Startweek, EndWeek)

FOREIGN KEY(OwnerId) REFERENCES Owner

FOREIGN KEY(PropId) REFERENCES Property

OwnerId NOT NULL