

Figure 1: ERD for Problems 1 to 4

## 1. Requirements for Data Modeling Problems

- 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

**Institution**(InstID, InstName, InstMascot)

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

**Lender**(LenderNo, LendName)

**Loan**(LoanNo, ProcDate, DisbMethod, DisbBank, DateAuth, NoteValue, Subsidized, Rate)

**DisburseLine**(DateSent, Amount, OrigFree, GuarFree)

- Entity type rule to convert each entity type

2. 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.

**Institution**(InstID, InstName, InstMascot)

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

**Lender**(LenderNo, LendName)

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

FOREIGN KEY(InstID) REFERENCES Institution(InstID)

FOREIGN KEY(StdNo) REFERENCES Student(StdNo)

FOREIGN KEY(LenderNo) REFERENCES Lender(LenderNo)

StdNo NOT NULL, InstID NOT NULL, LenderNo NOT NULL

**DisburseLine**(DateSent, LoanNo, Amount, OrigFree, GuarFree)

FOREIGN KEY(LoanNo) REFERENCES Loan(LoanNo)

- 1-M relationship rules for all relationships

3. 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.

- M-N rule not applicable as there are no M-N relations

4. 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.

By using Identification Dependency rule, LoanNo is a component of PrimaryKey of DisburseLine table, therefore the NOT NULL constraint is not required.

5. 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.

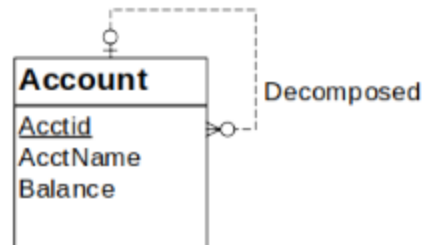


Figure 2: ERD for Conversion Problem 5

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

FOREIGN KEY(DecomposedAcctNo) REFERENCES Account

6. 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

**Owner**(OwnId, OwnName, OwnPhone)

**Property**(PropId, BldgName, UnitNo, Bdrms)

**Share**(OwnId, PropId, StartWeek, EndWeek)

FOREIGN KEY(OwnId) REFERENCES Owner

FOREIGN KEY(PropId) REFERENCES Property

- M-N relationship entity rules are applied to relationships