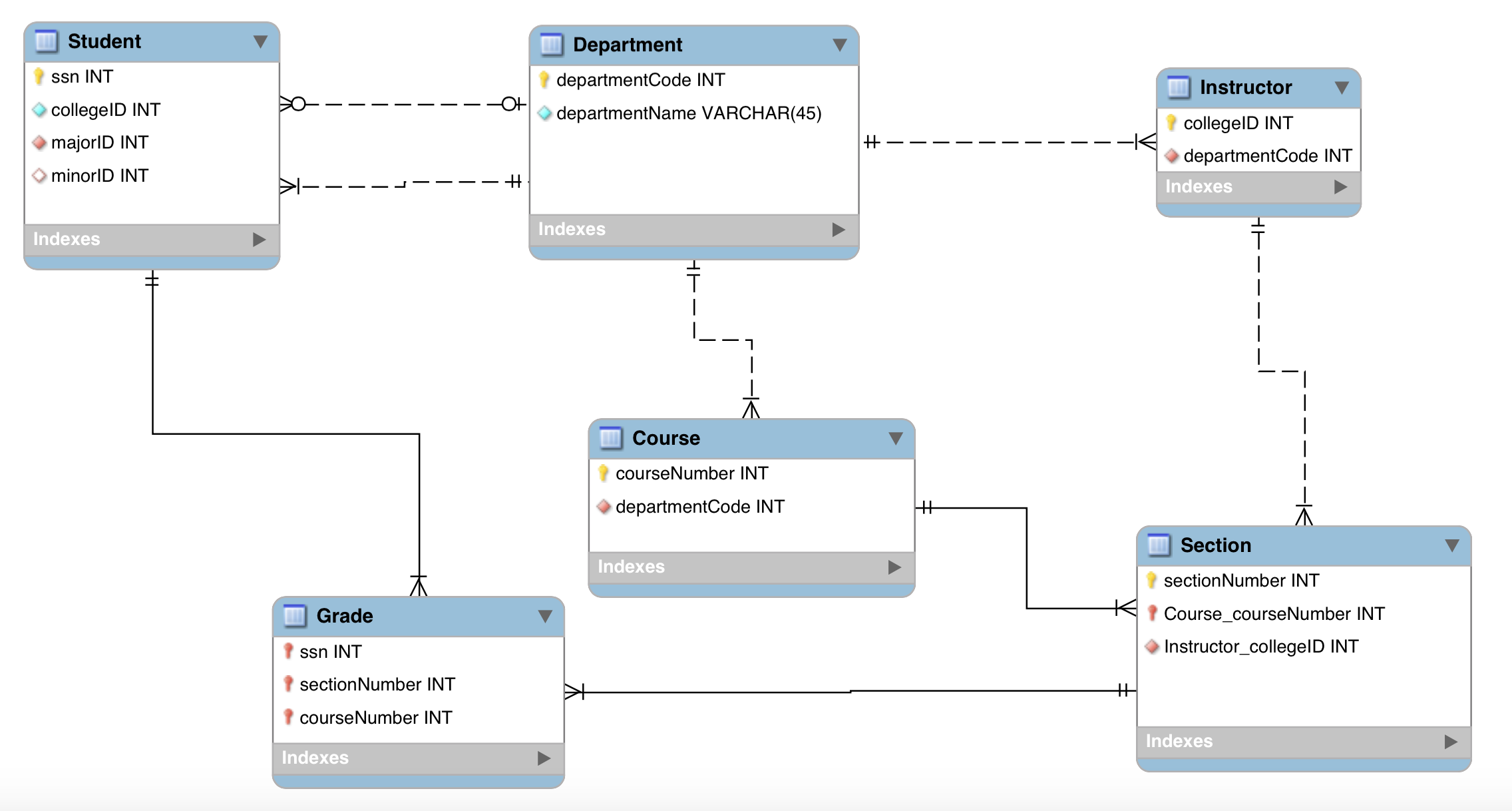
**Stephen Chambers**

**Assignemnt 5**

**CS875**

**Part 1:**



*Assumptions:*

1. Each course can only be offerred by one department.

2. A grade must contain both course number and section number.

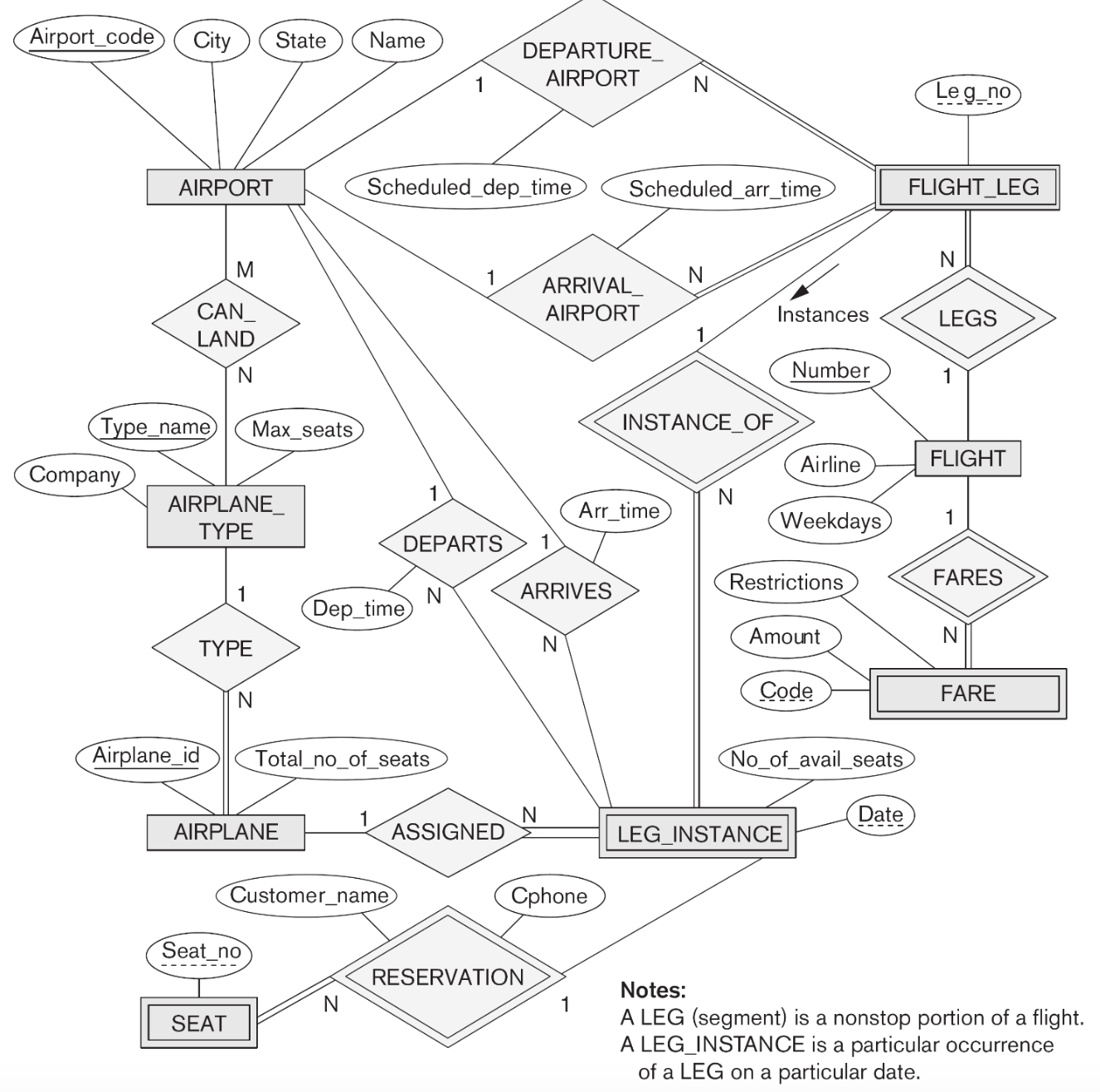
3. A student does not have to have a minor but MUST have a major.

4. A student must be in one and only one department.

5. An instructor can teach many sections.

6. A course does not necessarily need to be part of a department

**Part2:**

**

NOTE:

**A bold attribute** is a foreign key.

An underlined attribute is a primary key

*Step 1: Select Strong Entities*

AIRPORT(Airport\_code, City, State, Name)

AIRPLANE\_TYPE(Type\_Name, Max\_seats, Company)

AIRPLANE(Airplane\_id, Total\_no\_of\_seats)

FLIGHT(Number, Airline, Weekdays)

*Step 2: Select Weak Entities*

Note: Only bringing over double diamond relationship primary keys as foreign keys

SEAT(Seat\_no, **Date**, **Leg\_no**, **Number**, Cphone, Customer\_Name)

LEG\_INSTANCE(No\_of\_avail\_seats, Date, **Leg\_no**, **Number**)

FARE(Code, **Number**, Restrictions, Amount)

FLIGHT\_LEG(Leg\_no, **Number**, schedule\_arr\_time, schedule\_dep\_time)

*Step 3: 1:1 Relationships*

There are no 1:1 relationships.

*Step 4: 1:N Relationships*

AIRPLANE\_TYPE(1) 🡪 (N) AIRPLANE:

AIRPLANE\_TYPE(Type\_Name, Max\_seats, Company)

AIRPLANE(Airplane\_id, Total\_no\_of\_seats, **Type\_Name**)

All other 1:N relationships are *weak entities* and were taken care of in step 2.

*Step 5: M:N*

AIRPORT(M) 🡪 (N) AIRPLANE\_TYPE

CAN\_LAND(Airport\_code, Type\_name)

*Step 6: Multivalued attributes*

There are no multivalued attributes.

Final Database Schema:

AIRPORT(Airport\_code)

AIRPLANE\_TYPE(Type\_Name)

AIRPLANE(Airplane\_id, **Type\_Name**)

FLIGHT(Number)

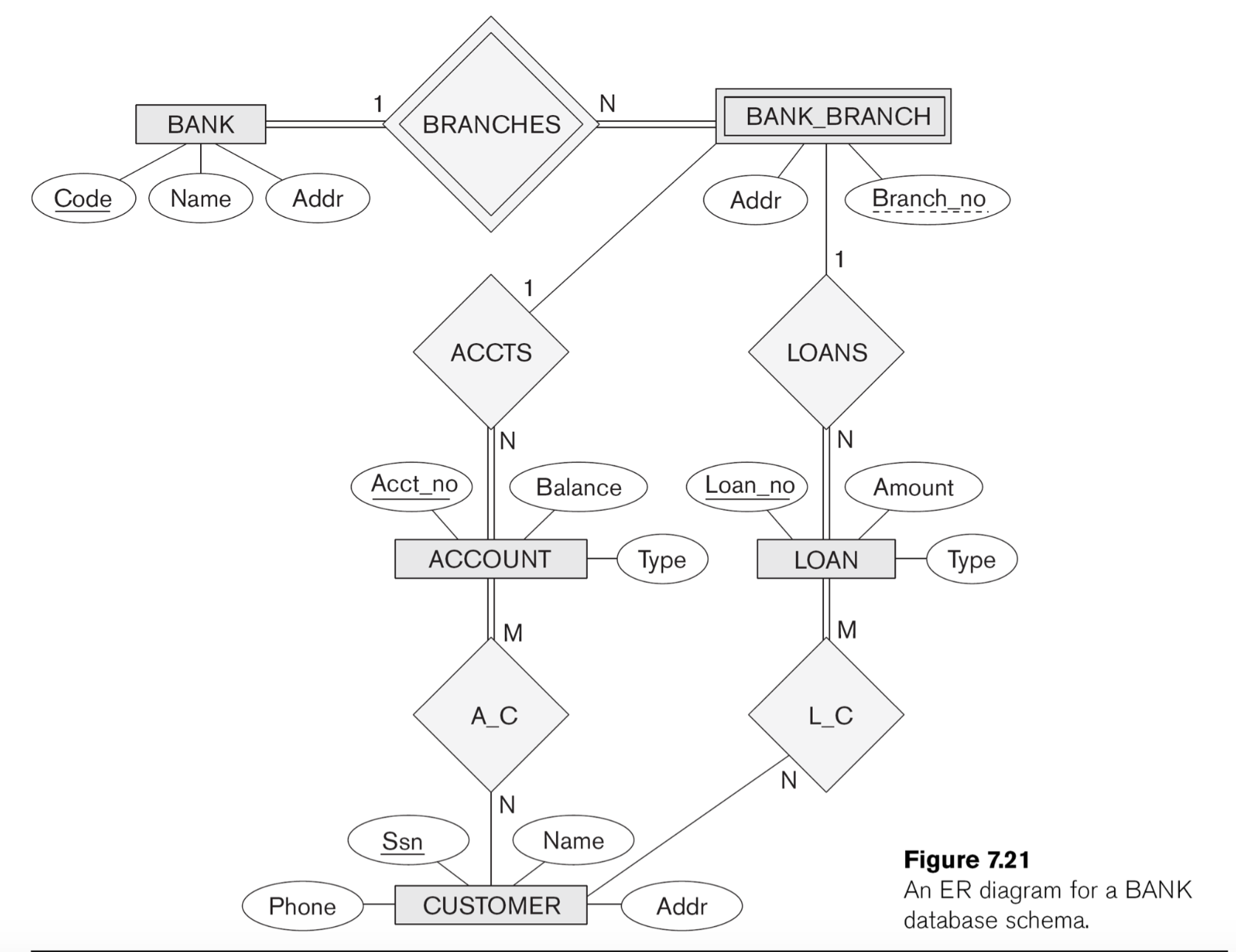
SEAT(Seat\_no, **Date**, **Leg\_no**, **Number**)

LEG\_INSTANCE(Date, **Leg\_no**, **Number**)

FARE(Code, **Number**)

FLIGHT\_LEG(Leg\_no, **Number**)

CAN\_LAND(Airport\_code, Type\_name)



*Step 1: Select Strong Entities*

BANK(Code, Name, Addr)

ACCOUNT(Acct\_no, Balance, Type)

LOAN(Loan\_no, Amount, Type)

CUSTOMER(ssn, phone, name, addr)

*Step 2: Select Weak Entities*

Note: Only bringing over Code as that is the only *double diamond* relationship connected to this entity.

BANK\_BRANCH(Addr, **Code**, Branch\_no)

*Step 3: 1:1 Relationships*

There are no 1:1 relationships.

*Step 4: 1:N Relationships*

BANK\_BRANCH(1) 🡪 (N) ACCOUNT:

BANK\_BRANCH(Addr, **Code**, Branch\_no)

ACCOUNT(Acct\_no, Balance, Type, **Code**, **Branch\_no**)

BANK\_BRANCH(1) 🡪 (N) LOAN:

BANK\_BRANCH(Addr, **Code**, Branch\_no)

LOAN(Loan\_no, Amount, Type, **Code**, **Branch\_no**)

All other 1:N relationships are *weak entities* and were taken care of in step 2.

*Step 5: M:N*

ACCOUNT(M) 🡪 (N) CUSTOMER

A\_C(Acct\_no, Ssn)

LOAN(M) 🡪 (N)CUSTOMER

L\_C(Loan\_no, Ssn)

*Step 6: Multivalued attributes*

There are no multivalued attributes.

Final Database Schema:

BANK(Code, Name, Addr)

ACCOUNT(Acct\_no, Balance, Type, **Code**, **Branch\_no**)

LOAN(Loan\_no, Amount, Type, **Code**, **Branch\_no**)

CUSTOMER(ssn, phone, name, addr)

BANK\_BRANCH(Addr, **Code**, Branch\_no)

A\_C(Acct\_no, Ssn)

L\_C(Loan\_no, Ssn)