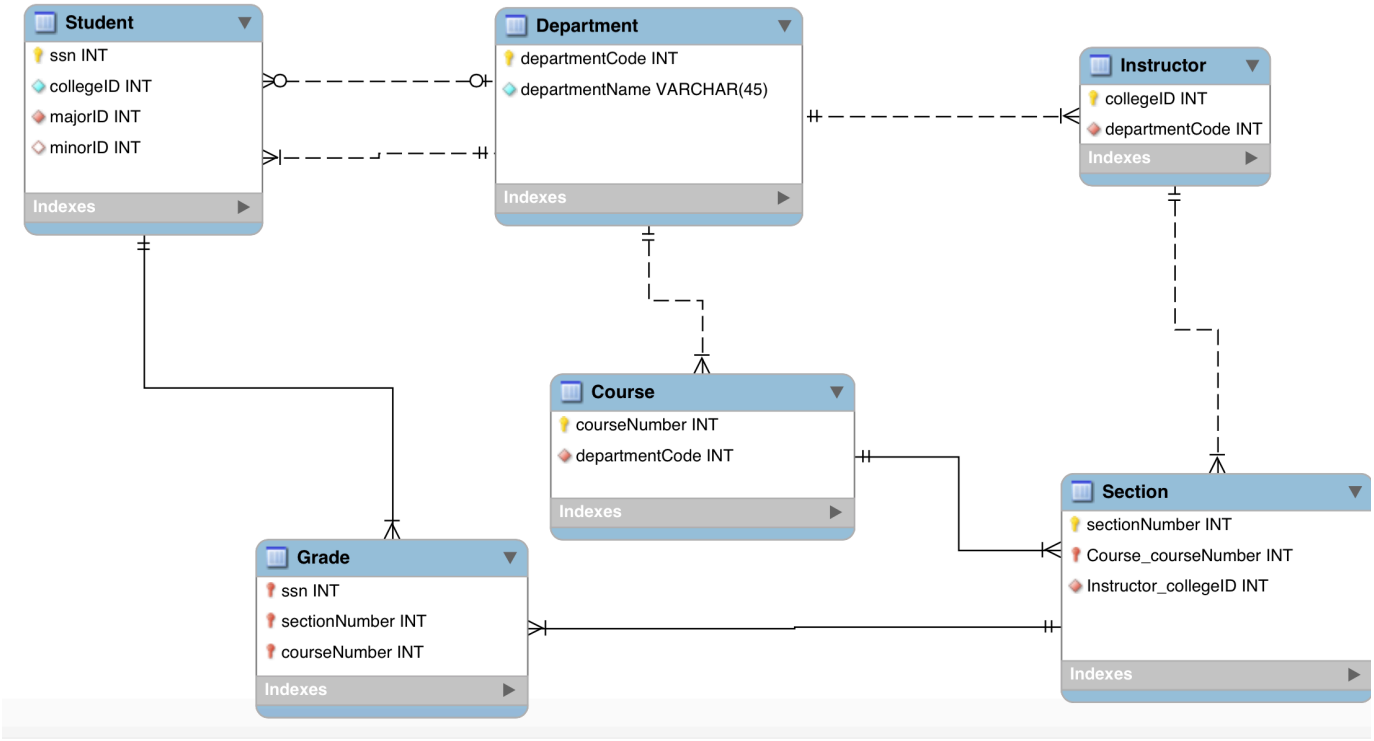
Stephen Chambers
Assignemnt 5
CS875

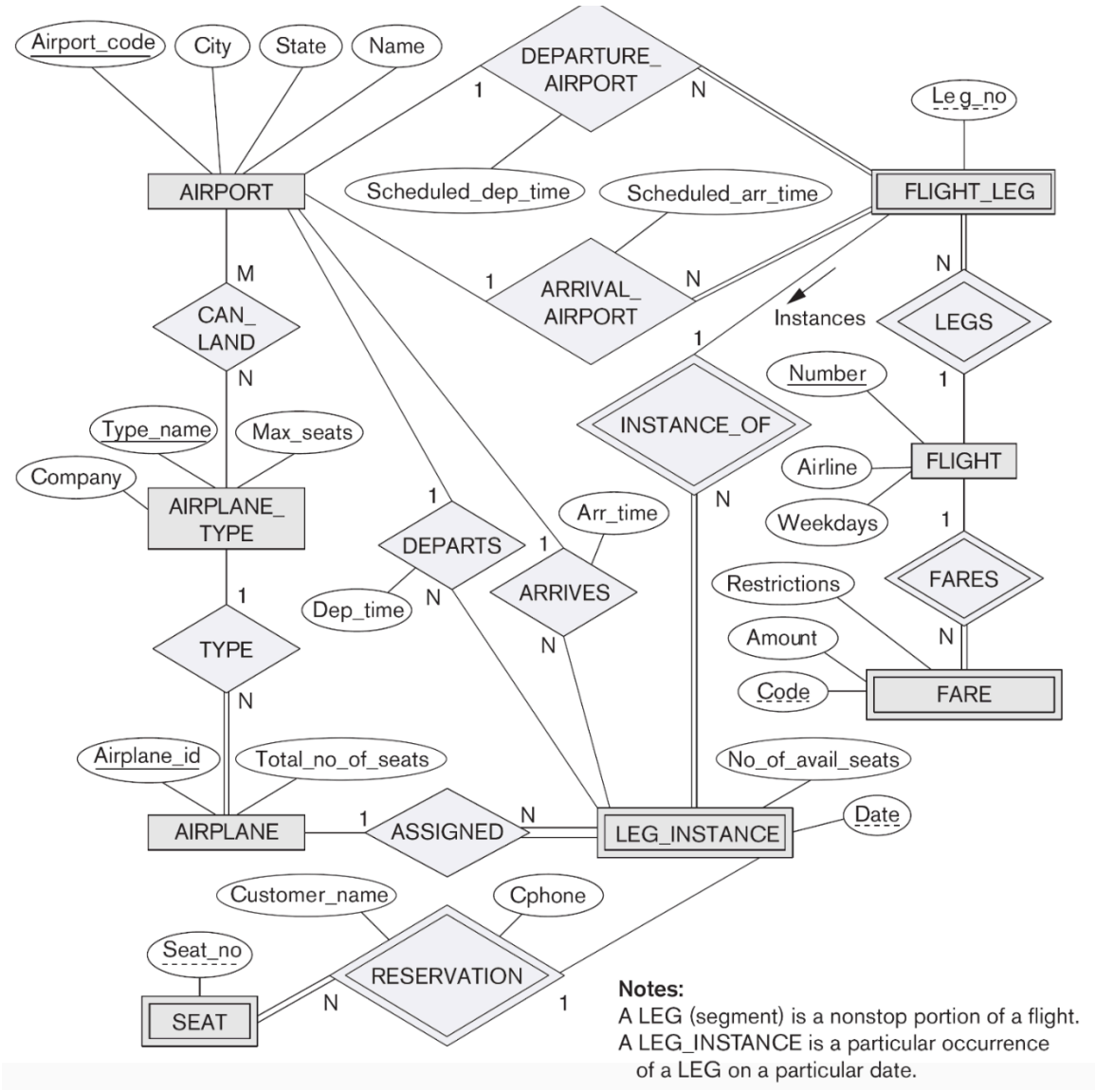
Part 1:



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)

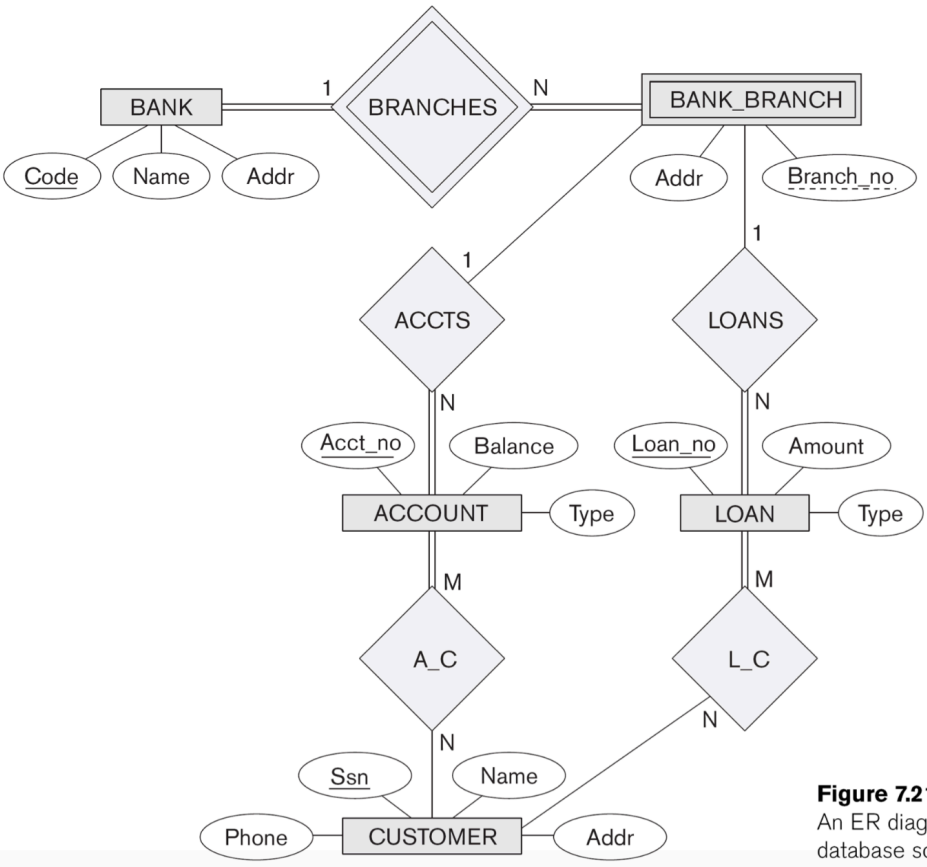


Figure 7.21
An ER diagram for a BANK database schema.

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)