Database Fundamentals
ERD – Mapping Lab

Problem 1

Musicana records have decided to store information on musicians who perform on their albums in a database. The company has wisely chosen to hire you as a database designer.

- Each musician that is recorded at Musicana has an ID number, a name, an address (street, city) and a phone number.
- Each instrument that is used in songs recorded at Musicana has a unique name and a musical type (e.g., C, B-flat, E-flat).
- Each album that is recorded at the Musicana label has a title, a copyright date, and an album identifier.
- Each song recorded at Musicana has a unique title and an author.
- Each musician plays several instruments (at least one instrument), and a given instrument is played by one or more musicians.
- Each album has a number of songs on it, but no song appears on more than one album. (no single songs)
- Each song is performed by one or more musicians, and a musician performs at least one song or more.
- Each album has exactly one musician who acts as its producer. A producer may produce several albums.

Design a conceptual schema for Musicana. Be sure to indicate all keys and cardinality constraints and any assumptions that you make.

CamScanner

Database Fundamentals
ERD – Mapping Lab

Problem 2

Prepare an E-R diagram for a real estate firm that lists properties for sale. The following describes this organization:

- The firm has a number of sales offices in several states. Attributes of sales office include Office Number and Location.
- Each sales office is assigned one or more employees. Attributes of employee include Employee_ID and Employee Name. An employee must be assigned to only one sales office.
- For each sales office, there is always one employee assigned to manage that office.
- The firm lists property for sale. Attributes of property include Property_ID and Location. Components of Location include Address, City, State, and Zip_Code.
- Each property must be listed with one (and only one) of the sales offices. A sales office may have any number of properties listed, or may have no properties listed.
- Each property has one or more owners. Attributes of owners are Owner_ID and Owner_Name. An owner owns one or more properties. The system stores the percent owned by each owner in each property.

Problem 3

- A General Hospital consists of a number of specialized wards. Each ward is described by ward_id, Name
- The system records the following details about patients: Patient_id, name, Date_Of_Birth
- Each ward host zero or more patients and each patient is hosted by only one ward.
- Each patient is assigned to one leading consultant and each consultant may be assigned to many patients
- Patient may be examined by at least one consultant, and the consultant examines one or more patients.
- Consultants are described by Consultant_id, Name
- A drug has code number, recommended dosage and more than one brand name
- The system has to record all required data (time the Nurse gives a patient a certain drug , actual dosage).
- Data about the nurse is recorded as her name and her number and her address.
- Each Nurse must serve in one ward
- Each ward is under supervision of one nurse and a nurse may supervise only one ward.

CamScanner

Database Fundamentals
ERD – Mapping Lab

Problem 4

Airlines companies that provide passenger services

1. Each airline has an identification number, name and address, name of the contact person and telephone numbers.

2. Each employee works in Airline Company has an employee identification number, name, address, birthday recorded as (day, month, year), gender, position with the company, and qualifications.

3. Each airline owns different aircraft models. For each aircraft an aircraft identification number, capacity, and model is recorded.

4. The aircrafts are assigned to one or more routes, each route has an identification number, origin, destination, distance, and classification.

5- Each route has many aircrafts. Some information are recorded such as (number of passengers, price per passenger, departure time, arrival time and the time that aircraft spent).

6. Each aircraft has its own crew (major pilot, assistant pilot, hostess 1 and hostess 2), the aircraft crew not stored as employee. Each crew is assigned to only one aircraft.

6. Each airline keeps information about their transactions. Each transaction has a transaction identification number, date, description, and amount of money

Draw an E-R diagram for the database presented above.

CamScanner

Database Fundamentals
ERD – Mapping Lab

Problem 5

A database for a banking system is used to control withdrawal, deposit and loan transactions with customers.

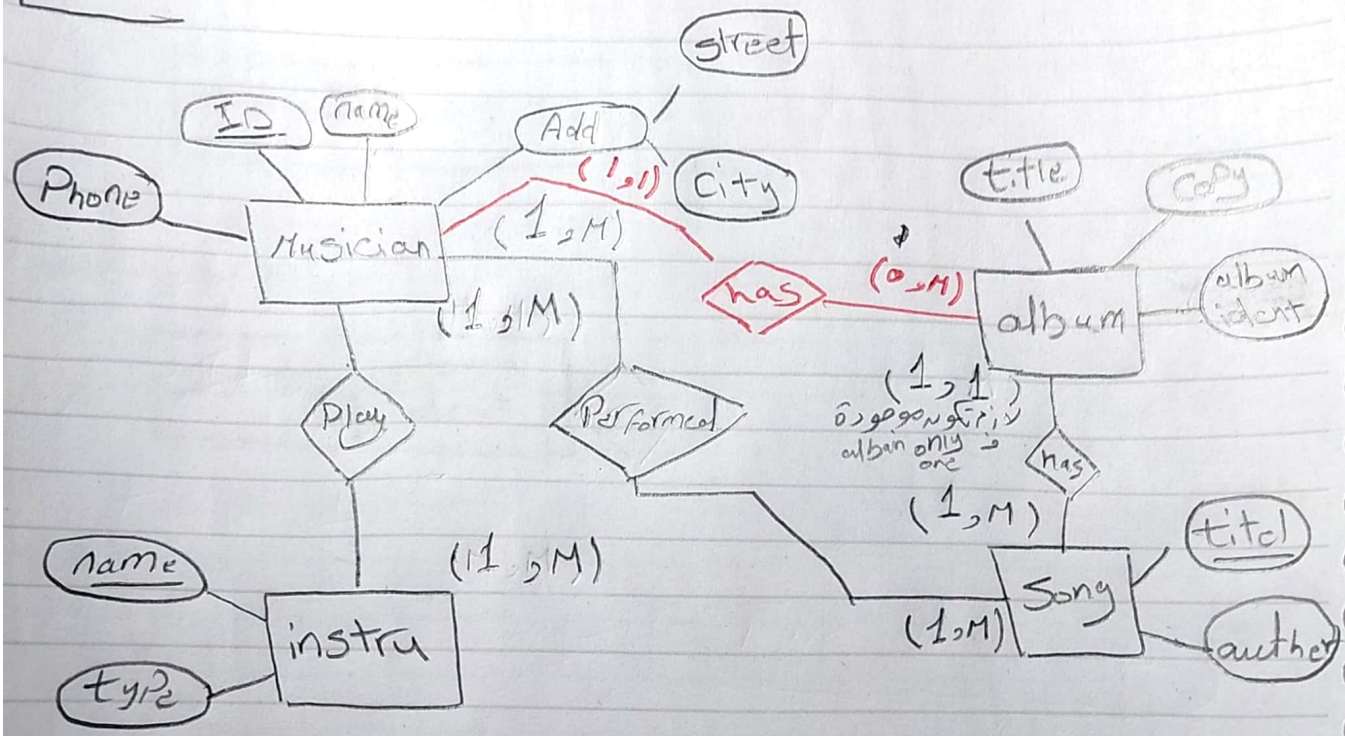
- Banks which use this system have many branches; each branch has a unique name, unique address and phone.
- The system stores information about customers as unique customer ID, name, address, and phones.
- Each customer have only one Account identified by unique Account number, amount and last transaction date (Day, Month and Year).
- A Customer can make any type of transactions (Withdrawal or Deposit).
- The system records Transaction number, Transaction type, Transaction date, Transaction amount. The Transaction must occur at only one branch.

Draw an ER diagram. Estimate any missing assumptions

CamScanner

Lab (1)

Ex (1)



musician

ID	name	street	Zone	Phone

instru

name	TyPe

Song

titlz	authcr

album

title	copy	ident

ablum_id

my_id

m ⟶ m

Musician ID	instru name

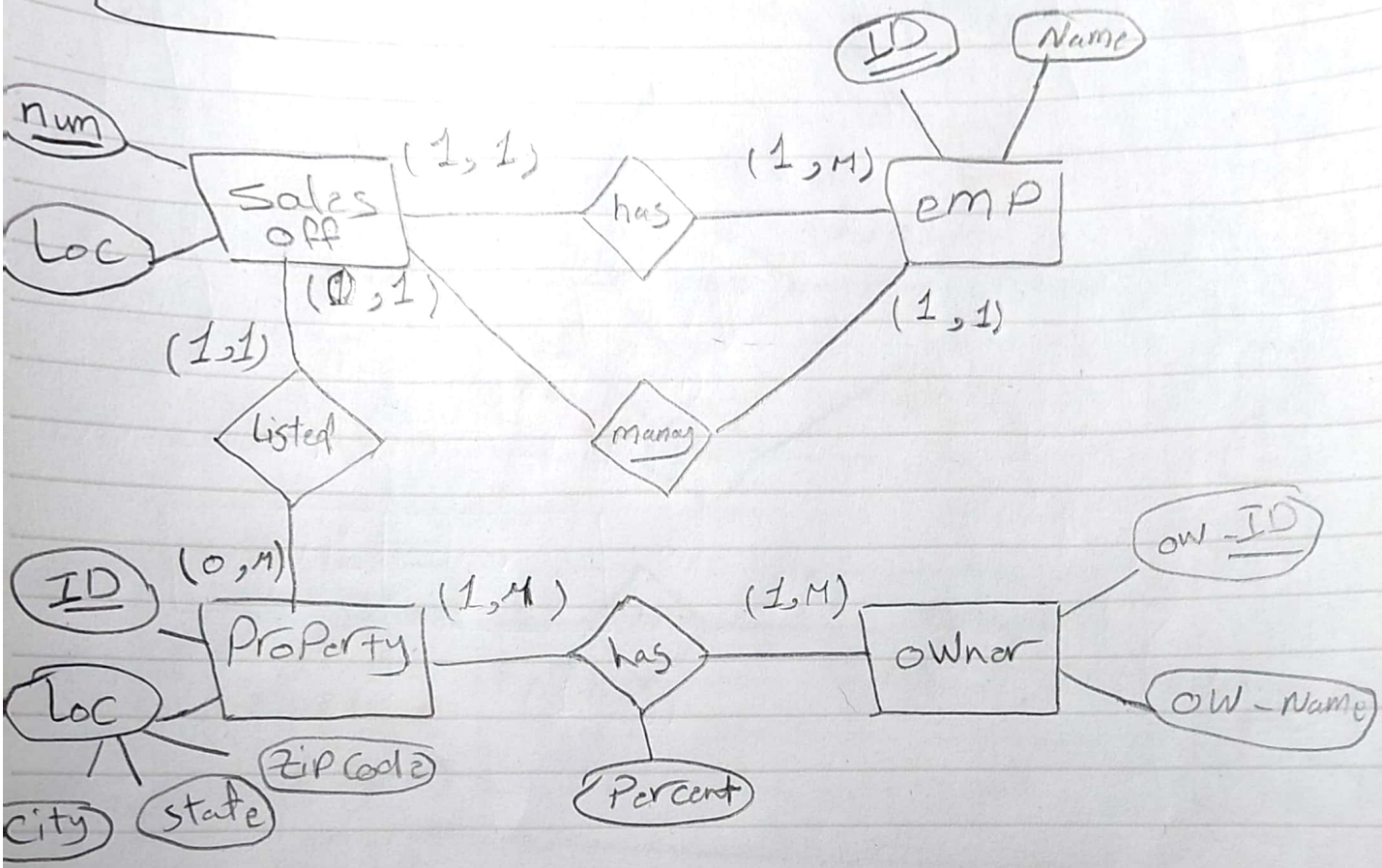
Musician ID	album ident

Musician ID	song title

one ⟶ m

Song title	album ident

EX 2



Sales off

off num	Loc	emp ID (no-null)

emp

ID	owner	off name

Property

ID	city	st	zip code	off name (no-null)

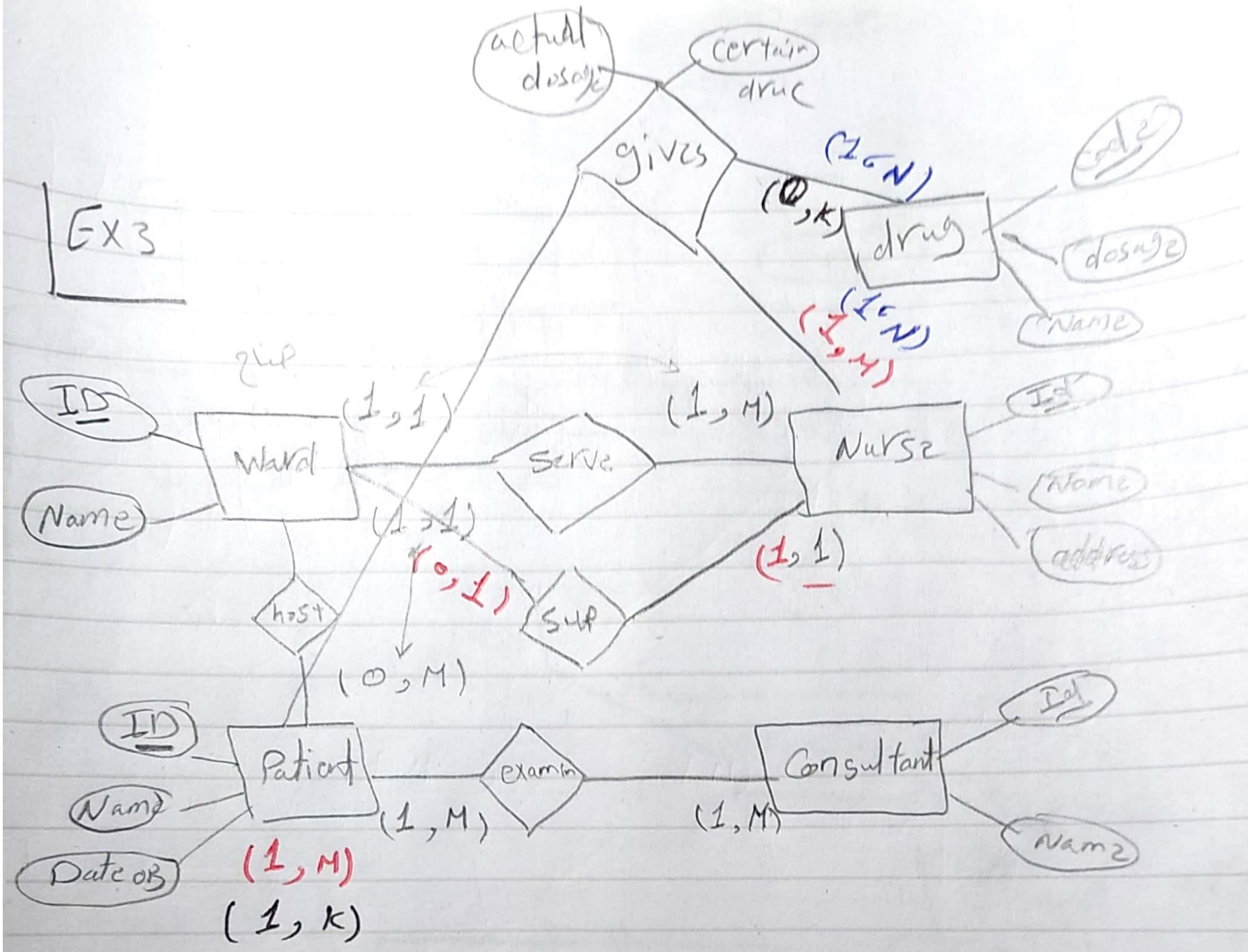
owner

ID	name

Prop-owner

Prop ID	ow ID	Precent

Ex3



Ward (ID, Name, Sup-Nurse-Id

Patient (ID, Name, DoB, Ward-Id NO-Null

Consultant (Id, Name

Nurse (Id, Name, adal, Ward-Id

drug (Code, Name, dosage

gives (drug-code, Nurse-Id, Pat-Id, certain drug, Actual dosage)

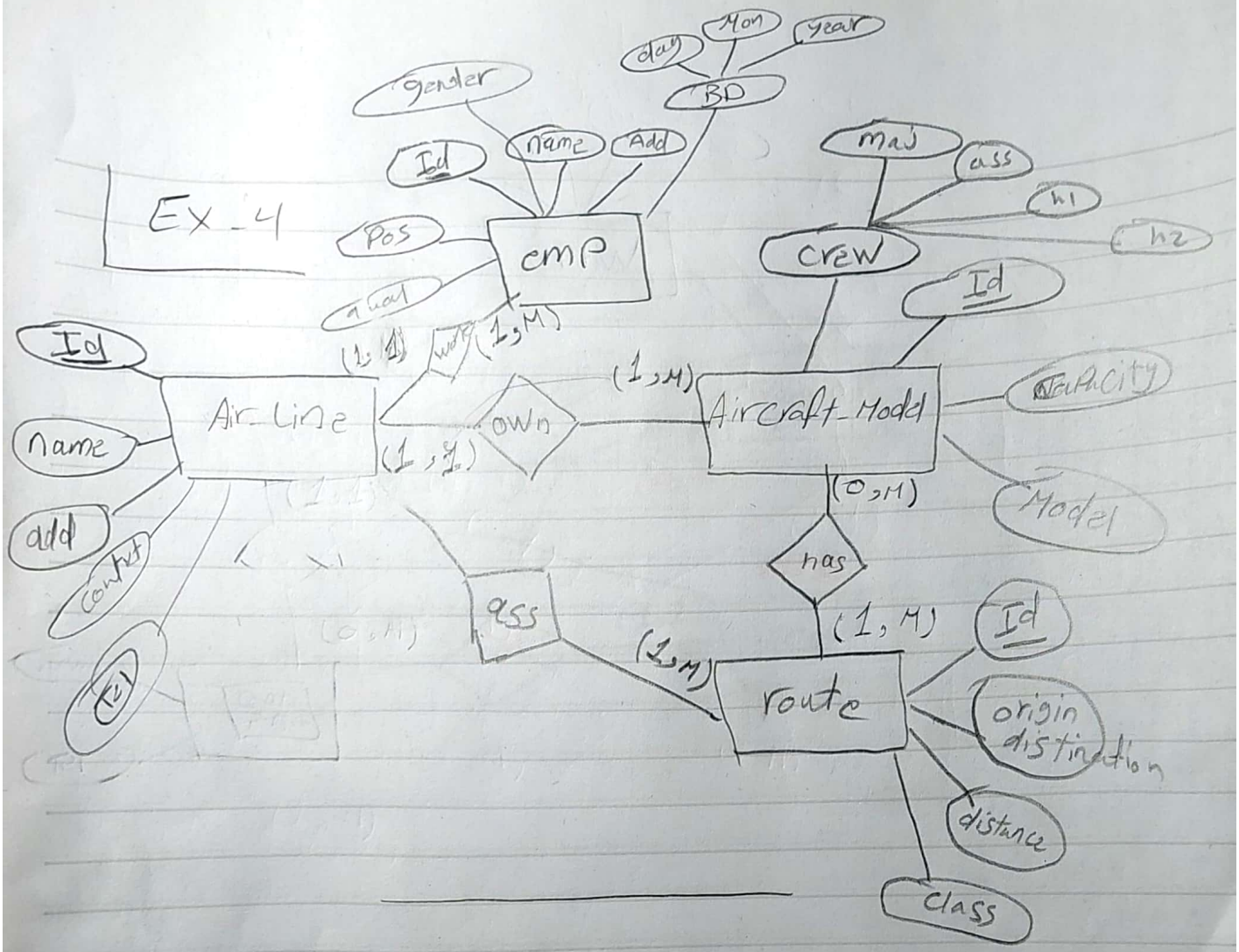
Pat. Id	Cons Id

Nurse Id	Pat Id

Nurse Id	drug Code

Nurse Id	Pat Id	drug Code

drug Code	Pat id



AirLine (Id , name , add

Cont_Person (name , telePhone , AirLine Id)

Air Line Id	Tel Num

route (Id , origin dist , distance , class , Airline_Id

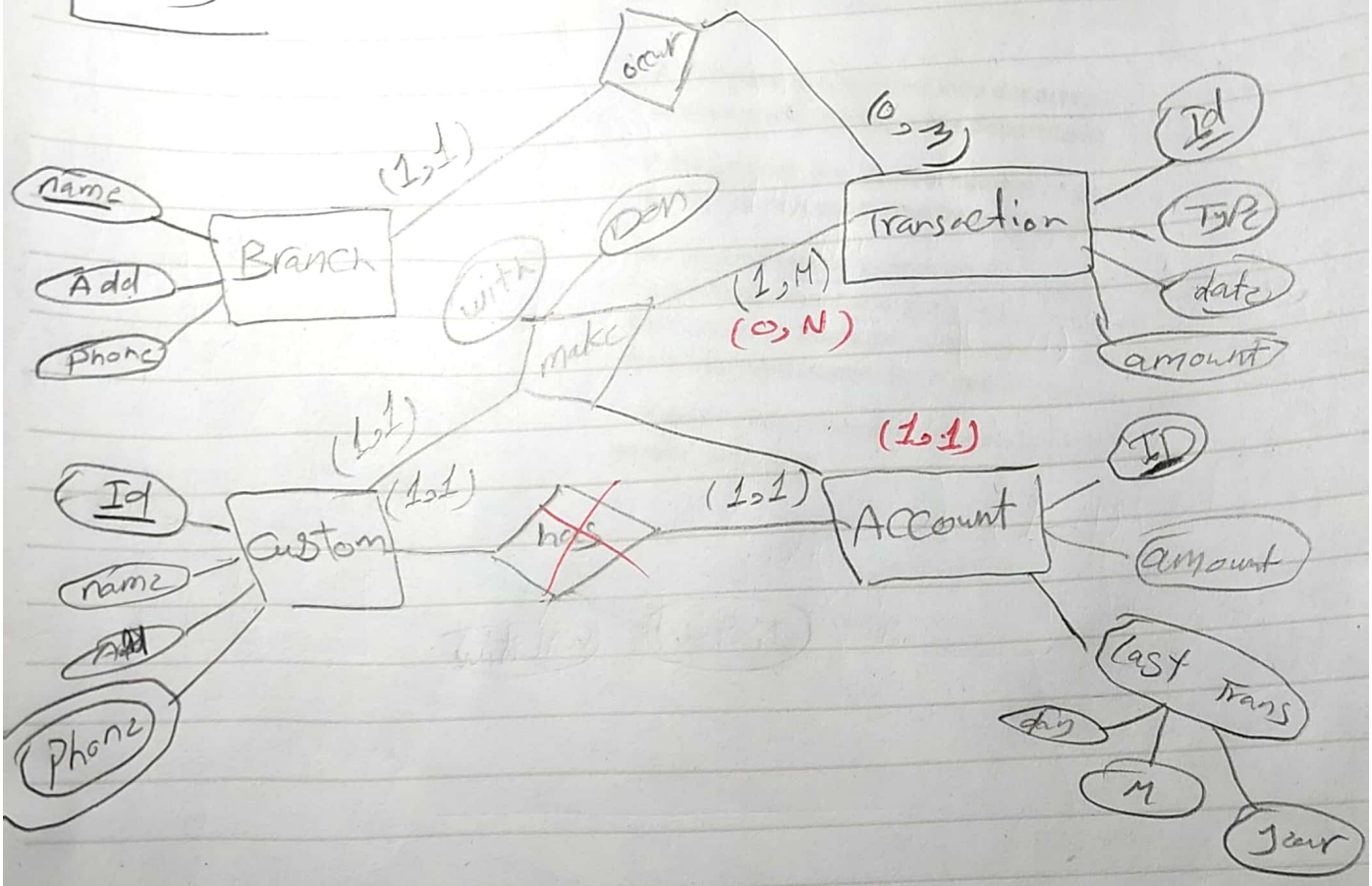
AirCraft_Mod (Id , Capacity , Model , maj_Pilot , ass , host1 , h2 , AirLine_Id)

emp (Id , name , gend , Add , day , Mon , year , Position , qual , AirLine_Id)

No Null

AirCraft Id	route Id

Ex 5



Branch (Name , Add , Phone)

Customer (Id , name , Add ,

Customer_Phone (Cus_Id , Phone

Account (Id , amount , Day of Trans , Mon of Trns , Year , Cust-Id)

Transaction (Id , Type , date , amount , Cust_Id , Account_Id)

Cust Id	Account Id	Trans	With	DoPos