

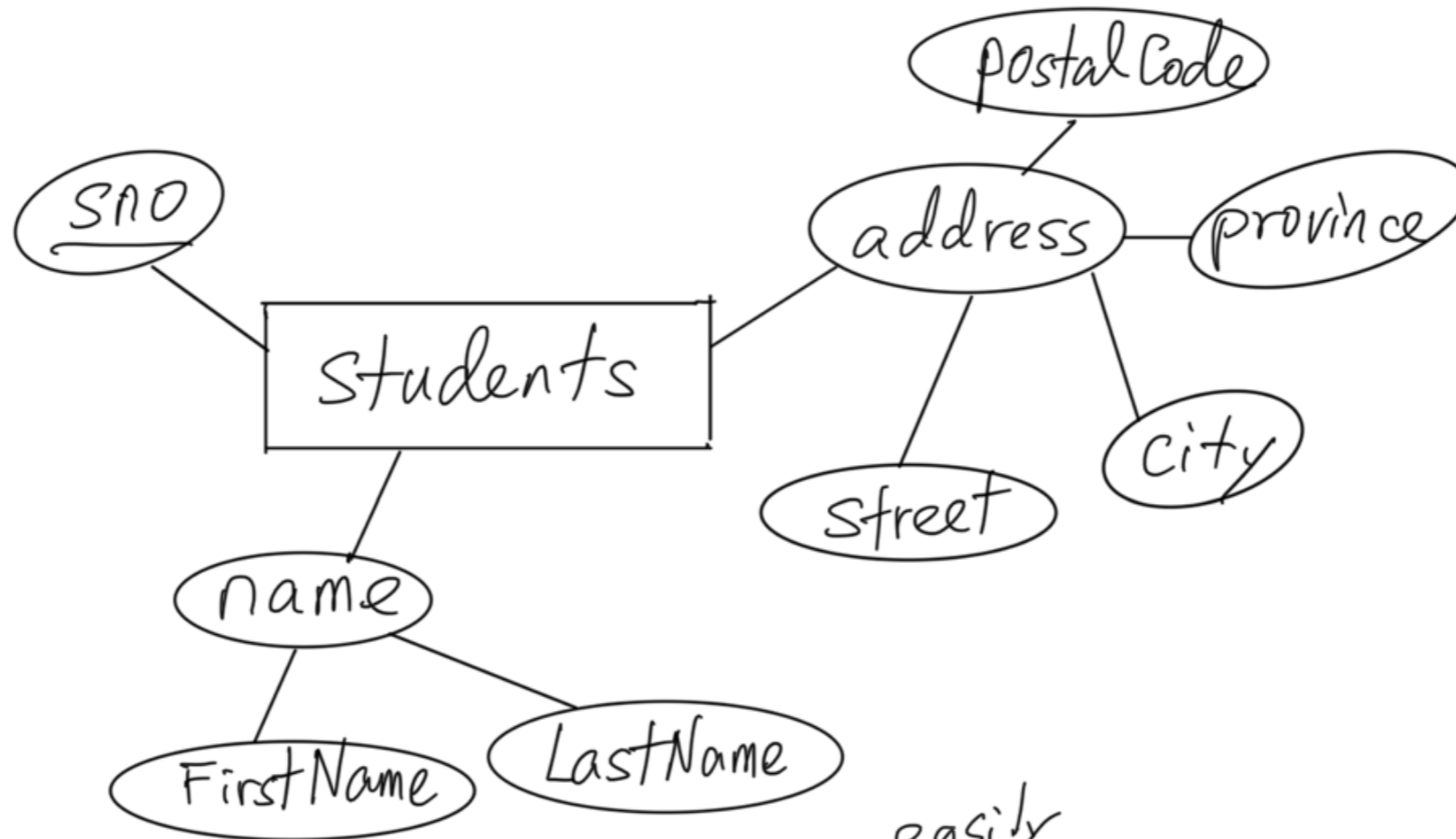
Database Management Systems

ER Modelling (II)

Extensions to ER model

- structured attributes
- aggregation — treating a relationship set as an entity set in other relationships
- specialization — subclasses
If entity set A is a specialization of entity set B , then every entity in A is also an entity in B , while some entities in B is not in entity set A .
- generalization — subclasses
If Entity set A is a generalization of entity set B and entity set C , then every entity in A is either in entity set B or in entity set C .

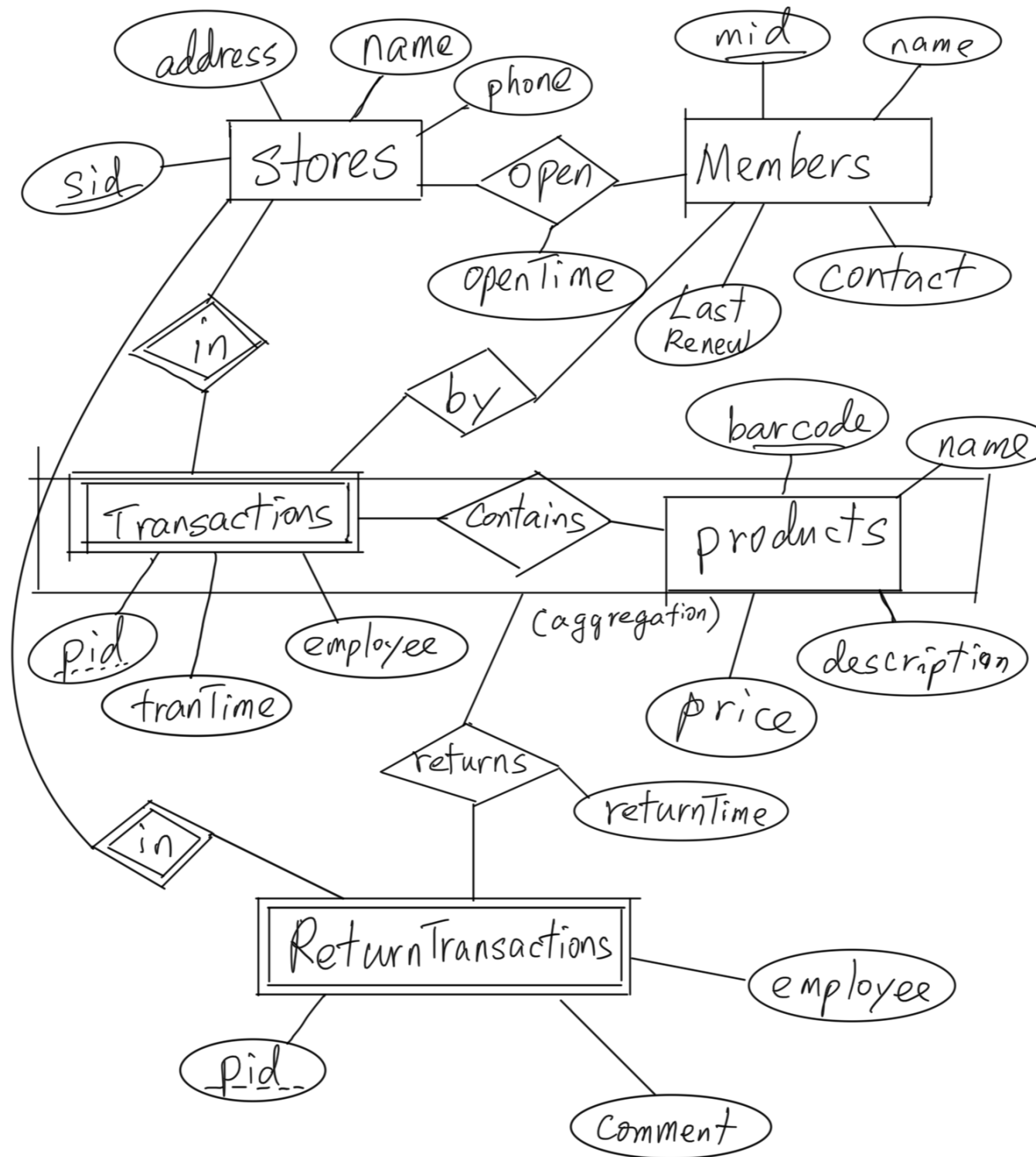
Structured Attribute



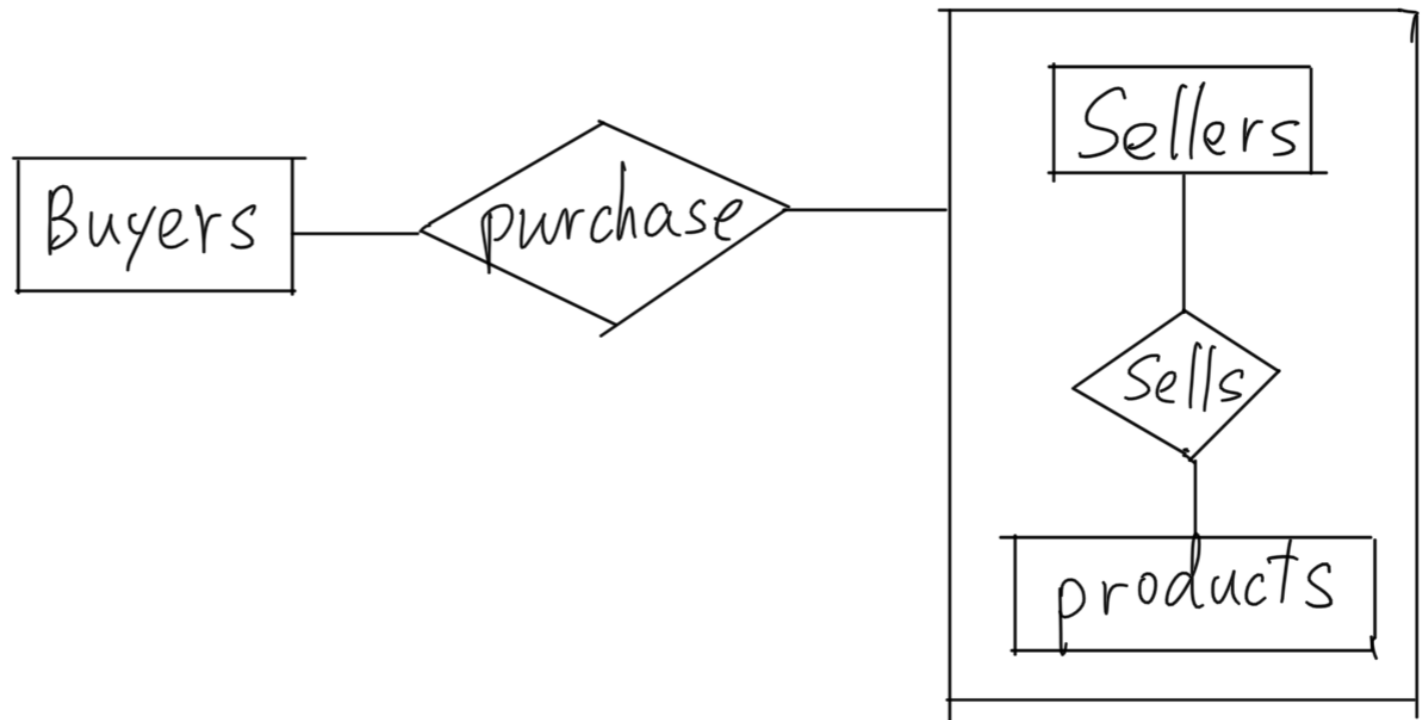
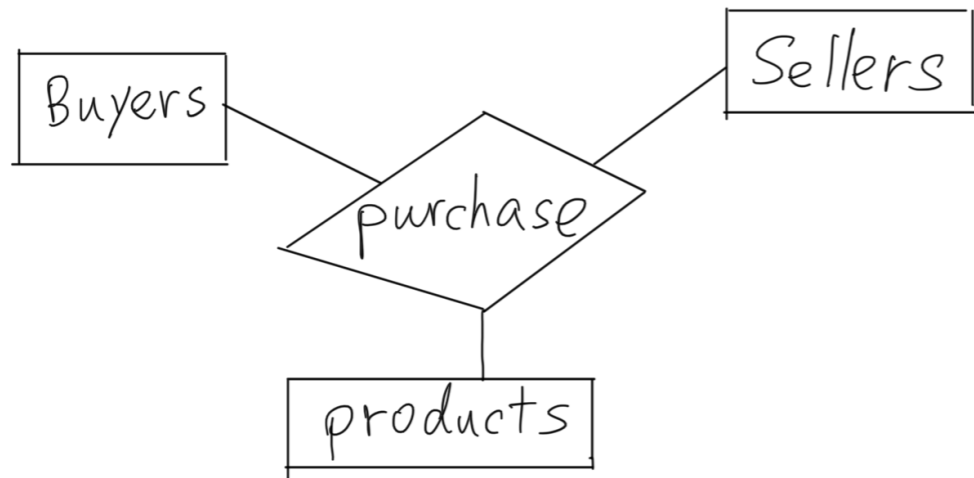
Ideally, but can't be done ^{easily} in relational database

Sno	Name		address			
	FirstName	LastName	street	city	province	postalcode

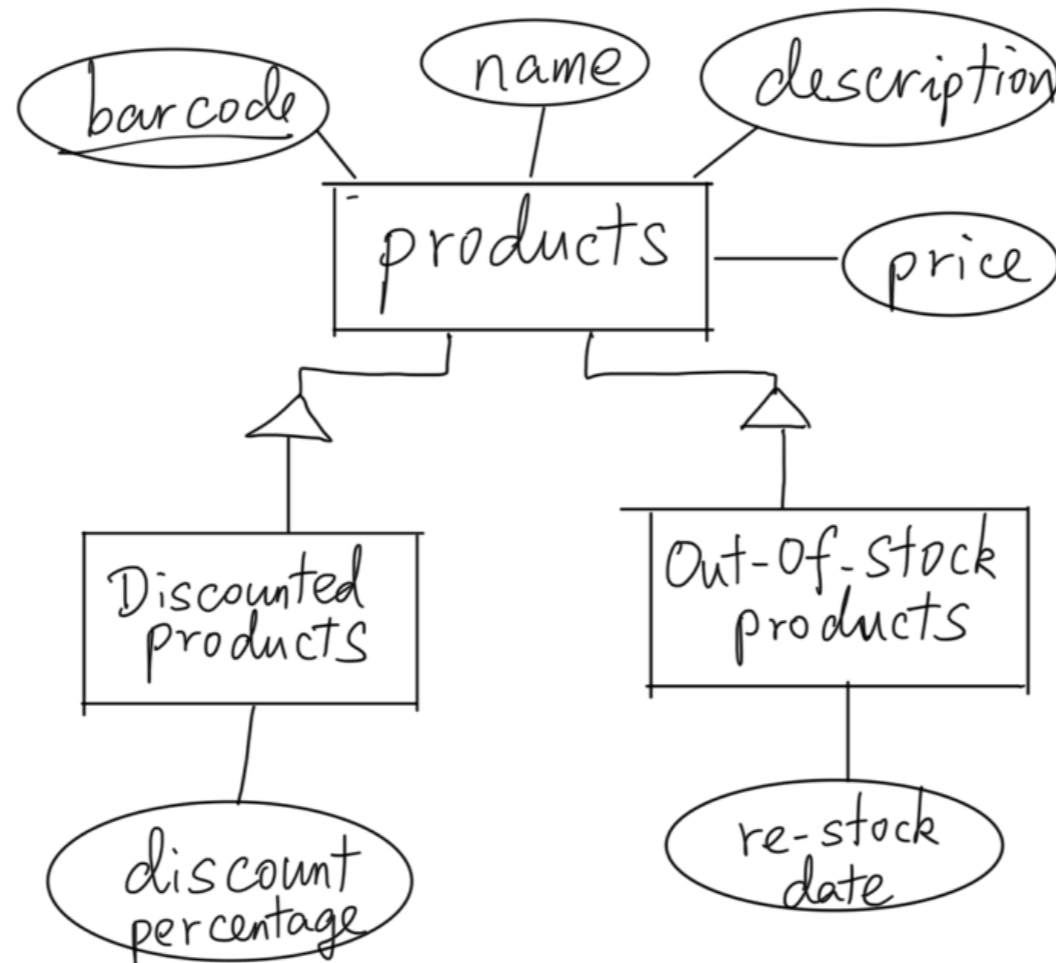
Aggregation



Aggregation

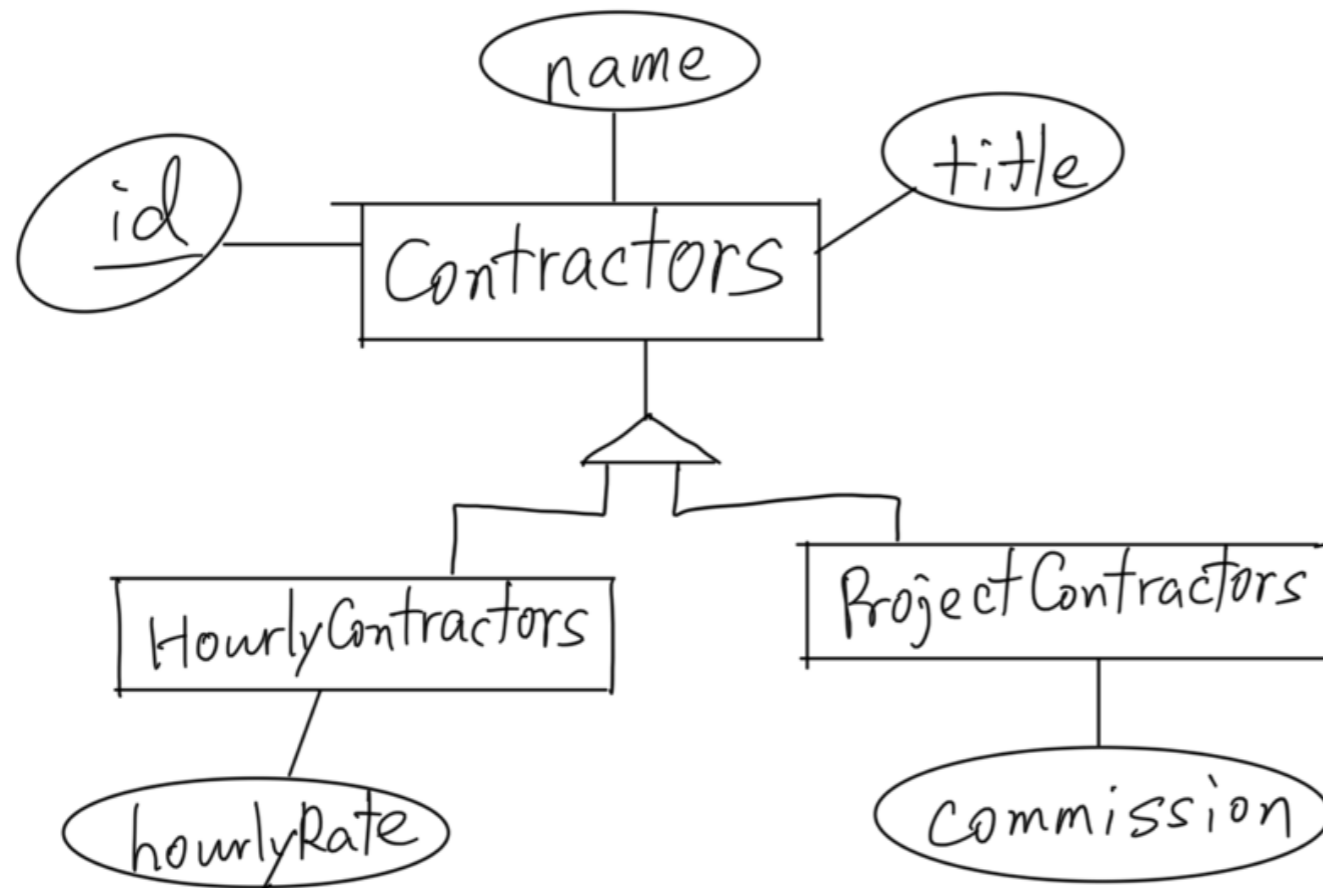


Specialization



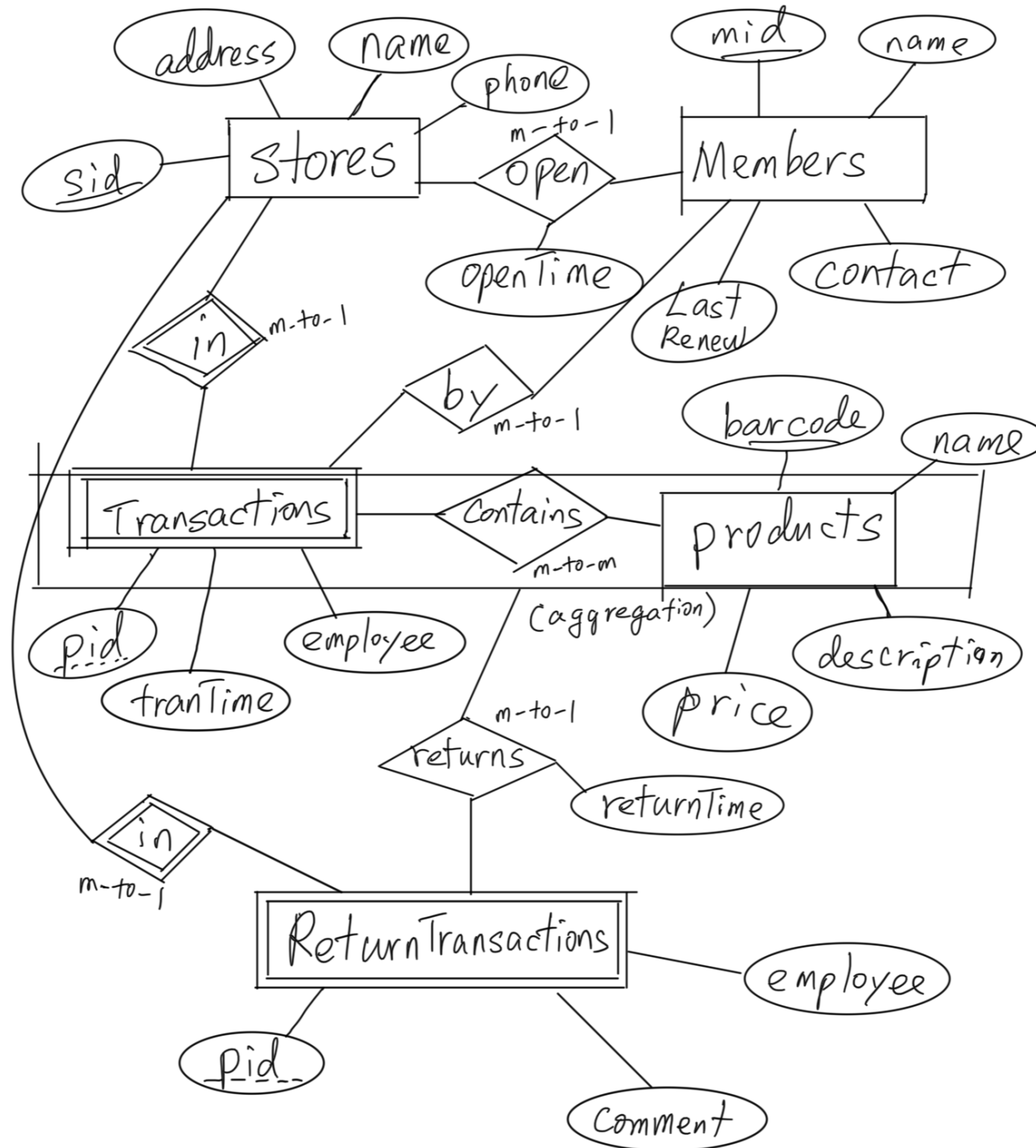
products (barcode , name , description , price) ← ←
DiscProducts (barcode , discountPCT)
OutStockProducts (barcode , reStockDate)

Generalization



```
HContractors(id, name, title, hourlyRate)
PContractors(id, name, title, commission)
create a view Contractors as
select id, name, title
from HContractors
union all
select id, name, title
from PContractors;
```

Types of Relationship Sets



ER Model to Relational Schema

- Strong entity set => relation with all attributes
- Weak entity set => relation with all attributes and the identifier from the dependent strong entity set
- Relationship sets
 - Many to Many => relation with the identifiers from both participating entity sets and the attributes of the relationship set
 - Many to one => extend the relation corresponding to the entity set that participate many times in the relationship set to include the identifier of the other entity set and the attributes of the relationship set
 - One to one => Same as Many to one relationship sets

Relational Schema

- Stores (sid, name, address, phone)
- Products (barcode, name, description, price)
- Members (mid, name, contactInfo, openAtStore, openTime, lastRenewTime)
- Transactions (sid, pid, transactionTime, customer, employee)
- TransactionContent (sid, pid, barcode)
- ReturnTransactions (returnStore, returnPid, sid, pid, barcode, returnTime, returnComment, employee)

Where

- In relation Members, openAtStore references Stores
- In relation Transactions, sid references Stores, and customer references Members
- In relation TransactionContent, (sid, pid) references Transactions, and barcode references Products
- In relation ReturnTransactions, returnStore references Stores, and (sid, pid, barcode) references TransactionContent