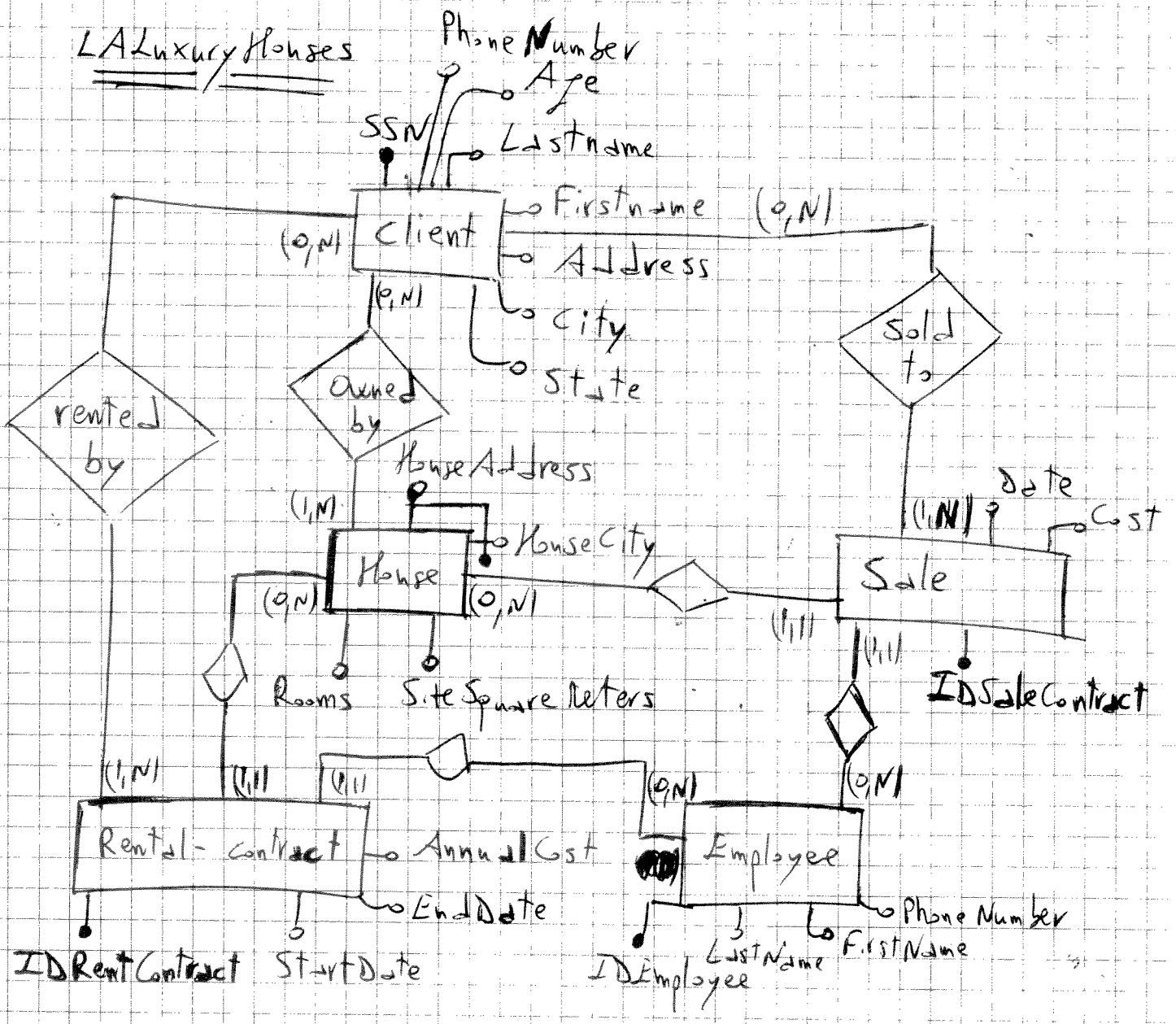
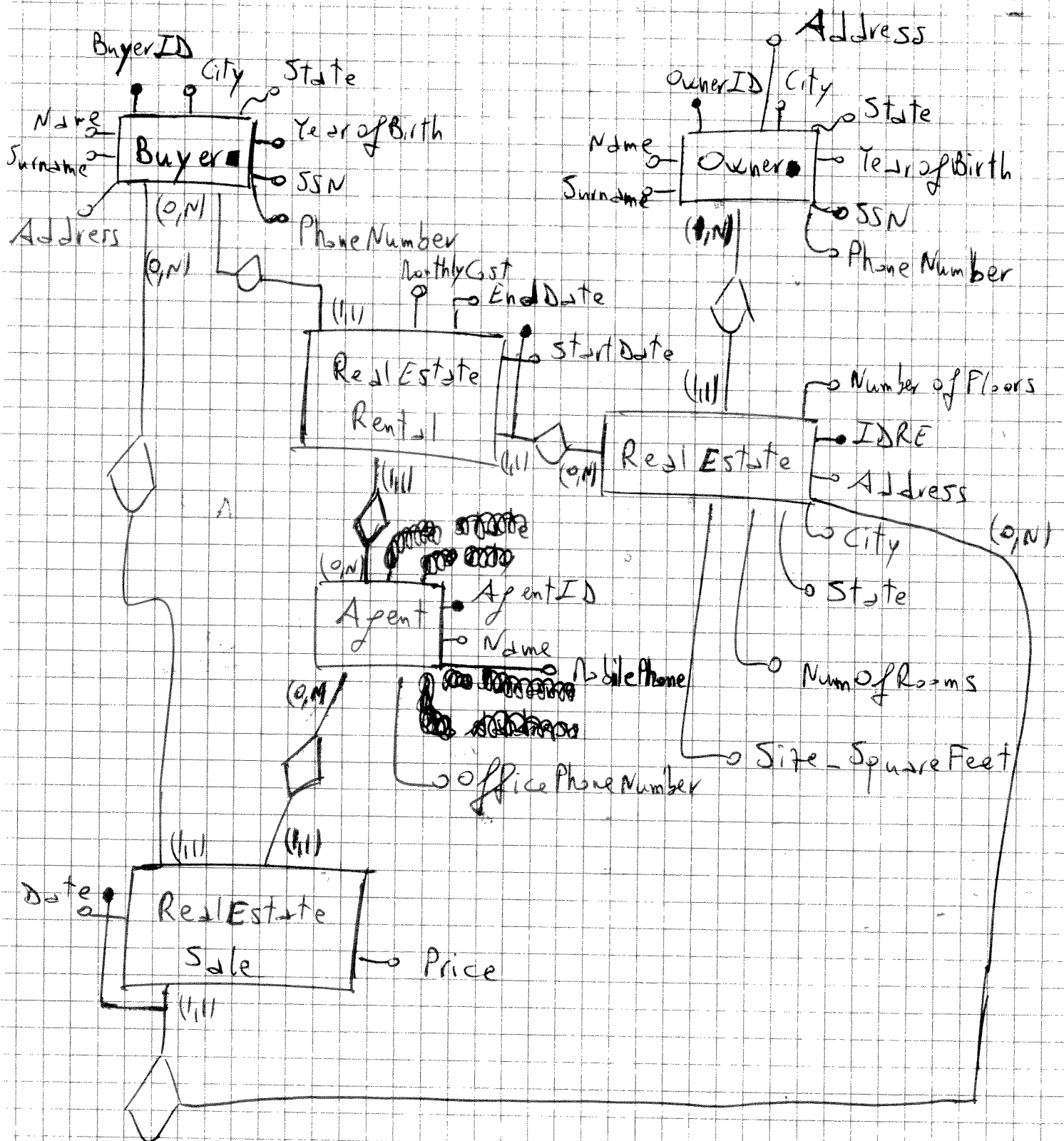


1 Reverse engineering

LA Luxury Houses



② USA Houses



2 Conflict analysis

LA Luxury Houses

Clients

USA Houses

Buyers/ Owners

Conflicts

- Key conflict
- Name conflicts
- Data semantics
 - ↳ Age ↔ Year of Birth

Houses

Real Estates

- Key conflict
- Name conflicts
- Data semantics
 - ↳ Site Square Meters ↔ Site-Square Feet

Employees

Agents

- Name Conflicts

Sale

Real Estate Sale

- Key Conflict
- Name Conflicts
- Cardinality conflicts

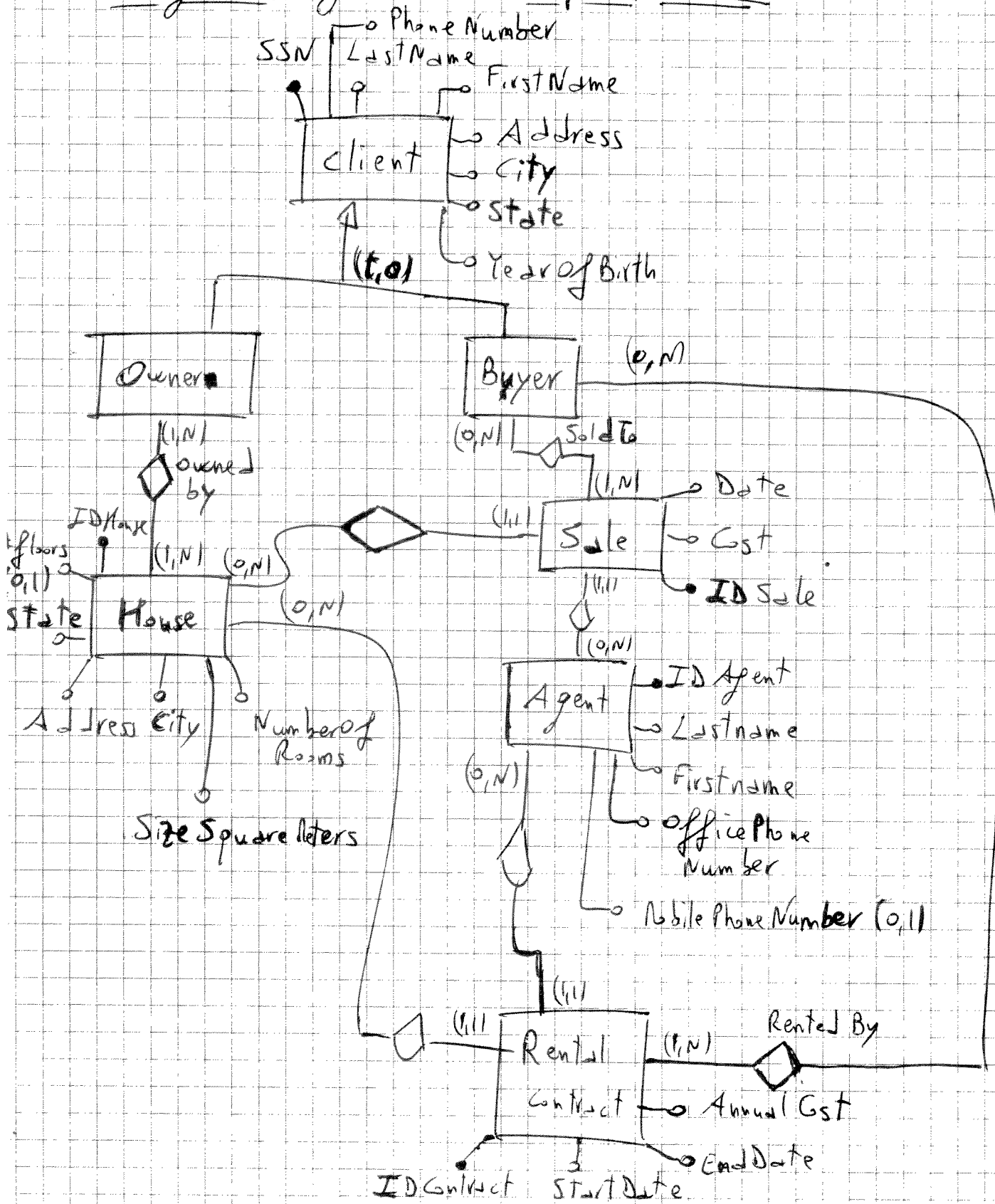
Rental-Contracts

Real Estate ~~sale~~ Rental

- Monthly cost ↔ Annual cost
- Key Conflict: cost
- Name conflicts
- Cardinality

(4)

Integrated global conceptual schema



I suppose that ~~LA~~ LA Luxury Houses, Employee, Phone Number is the office phone number of the employee

Measure conversions: - Annual Cost \leftrightarrow Monthly Cost * 12

- Site Square Meters \leftrightarrow Site - Square Feet * 0.092

Global logical schema (USA Real Estate Company) (5)

Client (SSN, LastName, FirstName, Address, City, State, Year of Birth, Phone Number ~~XXXXXXXXXX~~)

House (IDHouse, Address, City, State, Number of Rooms, # floors*, Site Square Meters)

Owned By (IDHouse, ~~XXXXXXXXXX~~ SSN)

Agent (IDAgent, LastName, FirstName, office Phone Number, Mobile Phone Number*)

Sale (IDSale, Cost, Date, IDAgent, IDHouse)

Sold To (IDSale, SSNClient)

Rental Contract (IDContract, StartDate, EndDate, Annual Cost, IDAgent, IDHouse)

Rented By (IDContract, SSNClient)

03a

Q4 Mappings

6

Only the tables used to answer to query Q are considered

```
CREATE VIEW USARentalEstateCompany.Client  
(SSN, LastName, FirstName, Address, City, State,  
Year of Birth, Phone Number) AS
```

```
SELECT SSN, LastName, FirstName, Address, City, State,  
CurrentYear() - Age, Phone Number  
FROM LALuxuryHouses.Clients
```

UNION

```
SELECT SSN, Surname, Name, Address, City, State,  
Year of Birth, Phone Number  
FROM USA USAHouses.Buyers
```

UNION

```
SELECT SSN, Surname, Name, Address, City, State,  
Year of Birth, Phone Number  
FROM USAHouses.Owners;
```

CREATE VIEW House (IDHouse, Address, City, State,
Number of Rooms, #floors, Site Square Meters)

AS

Select Key GenHouse (House Address + House City + "State of California",
'LA Luxury Houses'),
House Address, House City, "State of California",
Rooms, null, Site Square Meters

FROM LALuxuryHouses.Houses

UNION

Select Key GenHouse (Address + City + State + IDRE, 'USA Houses'),
Address, City, State, Num of Rooms,
Site Square Feet * 0.092

FROM USAHouses.RealEstates;

Key GenHouse(-, -) is a function that generates a unique code for each house.

CREATE VIEW Sale (IDSale, Cost, Date, IDAgent, IDHouse)

AS Key GenSale (IDSaleContract, 'LALuxuryHouses')

Select ~~IDSaleContract~~, Cost, Date, ~~IDEmployee~~ ~~IDAgent~~

~~IDAgent~~ Key Gen Agent (IDEmployee, 'LALuxuryHouses'),

Key Gen House (House Address + House City + "State of Cal"

'LA Luxury Houses').

FROM LALuxuryHouses.Sale

UNION

Select Key GenSale (IDRE + Date, 'USA Houses'), Price, Date,

Key Gen Agent (AgentID, 'USA Houses'), Key Gen House (Address

FROM USAHouses.RealEstate-Sale RS, RealEstates RE

where RS.IDRE = RE.IDRE.

Key Gen Sale (-, -) → ~~It~~ It generates unique sale identifiers

Key Gen Agent (-, -) → It generates unique agent identifiers

```

CREATE VIEW SoldTo (IDSale, SSNClient) AS
Select Key Gen Sale (IDSale Contract, 'LALuxuryHouses'),
Client SSN
FROM LALuxuryHouses. SoldTo

UNION

Select Key Gen Sale (IDRE + Date, 'USAHouses'), SSN
FROM USAHouses. Real Estate - Sale. RS,
USAHouses. Buyers B
where RS. BuyerID = B. BuyerID;

```


36 Query Q posed on USARentalEstate Company
(Global Schema)

SQL version

```

Select LastName, FirstName
FROM Client, Sale, SoldTo, House
where Sale.IDHouse = House.IDHouse
and SoldTo.IDSale = Sale.IDSale
and SoldTo.SSNClient = Client.SSN
and Client.City = 'Los Angeles'
and House.City = 'Beverly Hills'
and SizeSquareMeters > 100;

```

DATALOG version

```

Q(x, y) :- CLIENT(S, x, y, -, 'Los Angeles', -, -),
SALE(I, -, -, -, H),
SOLDTO(I, S),
HOUSE(H, -, 'Beverly Hills', -, -, SM),
SM > 100

```

3 Query rewriting

~~XXXXXXXXXXXXXXXXXXXX~~ *

$Q(x, y) :-$ CLIENT(S, x, y, -, 'Los Angeles', -, -, -),
 SALE(I, -, -, -, H),
 SOLDTo(I, S),
 HOUSE(H, -, 'Beverly Hills', -, -, -, SM),
 SM > 100

↓ Unfolding - LALuxuryHouses data source
 (LA)

$Q(x, y) :-$ LA.CLIENTS(S, x, y, -, 'Los Angeles', -, -, -),
 LA.SALE(I, HA, HC, -, -, -),
 LA.SOLDTo(I, S),
 LA.HOUSES(HA, HC, SM, -),
 HC = 'Beverly Hills', SM > 100

Unfolding - USAHouses data source
 (USA)

Next page



↓ Unfolding - USA House data source (USA)

Q(x, y) :- ~~SELECT~~

CLIENT [USA.BUYERS(-, Y, X, -, 'Los Angeles', -, -, S, -),

SALE [USA.REALESTATE-SALE(IDRE, D, -, -, -),
USA.REALESTATES(IDRE, HA, HC, HS, -, -, -, -),

SOLD TO [USA.REALESTATE-SALE(IDRE, D, B, -, -),
USA.BUYERS(B, -, -, -, -, -, S, -)

HOUSE [USA.REALESTATES(IDRE, HA, HC, HS, -, SM, -, -),
HC = 'Beverly Hills',
SM = 100 / 0.092

⇓ Simplifications

Q(x, y) :- ~~SELECT~~

USA.BUYERS(B, Y, X, -, 'Los Angeles', -, -, -),

USA.REALESTATE-SALE(IDRE, D, B, -, -),

USA.REALESTATES(IDRE, -, HC, -, -, SM, -, -),

HC = 'Beverly Hills',

SM = 100 / 0.092