Workshop 2

1. a) $\pi_{Number}(\sigma_{area>50}(Apartment))$

Number
102
103
306
308
409
310

b) $\pi_{Number, owner}(\sigma_{Rooms>2}(Apartment) \wedge \sigma_{Rooms<4}(Apartment))$

Number	Owner
102	Neil Pearl
103	Alex Van Halen
306	Sammy Hagar
409	Wolfgang Van Halen
310	Valerie Bertinelli

c) $\pi_{Number, owner, Area}(\sigma_{Area>40}(Apartments) \wedge \sigma_{Area<70}(Apartment))$

Number	Owner	Area
101	Chad Smith	45
102	Neil Pearl	60
305	David Lee Roth	50
308	Gary Cherone	55
409	Wolfgang Van Halen	65

d) $\rho_{VanHalenApartments}(\sigma_{Owner\ LIKE\ "Van\ Halen"}(Apartment))$

ApartmentID	Number	Block	Owner	Area	Rooms
3	103	1	Alex Van Halen	75	3
4	304	2	Eddie Van Halen	30	1
9	409	1	Wolfgang Van Halen	65	3

e) $\pi_{Number}((\sigma_{Area>60}(Apartment)) \times PublicServices)$

Number	ServiceID	Name
102	1	"Water"
102	2	"Electricity"
102	3	"Gas"
103	1	"Water"
103	2	"Electricity"
103	3	"Gas"
306	1	"Water"
306	2	"Electricity"
306	3	"Gas"
409	1	"Water"
409	2	"Electricity"
409	3	"Gas"
310	1	"Water"
310	2	"Electricity"
310	3	"Gas"

2.

a) $\pi_{Name}(\sigma_{Age>50}(Owner))$

Name
Alex Van Halen
Eddie Van Halen
David Lee Roth
Sammy Hagar
Michael Anthony
Valerie Bertinelli

b) $\pi_{Name, Age}(\sigma_{children>1}(Owner) \wedge \sigma_{Children<3}(Owner))$

Name	Age
Chad Smith	50
Eddie Van Halen	58
Sammy Hagar	65
Valerie Bertinelli	65

c) $\pi_{Name, Age, Children}(\sigma_{Age>40}(Owner) \wedge \sigma_{Age<60}(Owner))$

Name	Age	Children
Chad Smith	50	2
Neil Pearl	45	1
Eddie Van Halen	58	2
David Lee Roth	55	1

d) $\rho_{R\ Owners}(\sigma_{Name="ar"}(Owner) \cup \sigma_{Name\ LIKE\ \%ar\%}(Owner))$

OwnerID	Name	Age	Children	Pets
2	Neil Pearl	45	1	0
6	Sammy Hagar	65	2	1
8	Gary Cherone	40	1	0

e) $\Pi_{Name}(\sigma_{Pets>1}(Owner) \wedge \sigma_{Children<2}(Owner))$

Name

3. a)

$\rho_{NewYearReservations}(\Pi_{ApartmentNumber, Owner, CommonSpace}(\sigma_{Date='2020-01-01'}(Reservations)))$

ApartmentNumber	Owner	CommonSpace

b) $\Pi_{Owner}(\sigma_{Date>2024-01-02}(Reservations) \wedge (\sigma_{CommonSpace="Pool"}(Reservations) \cup \sigma_{ApartmentNumber=104}(Reservations) \cup \sigma_{ApartmentNumber=102}(Reservations)))$

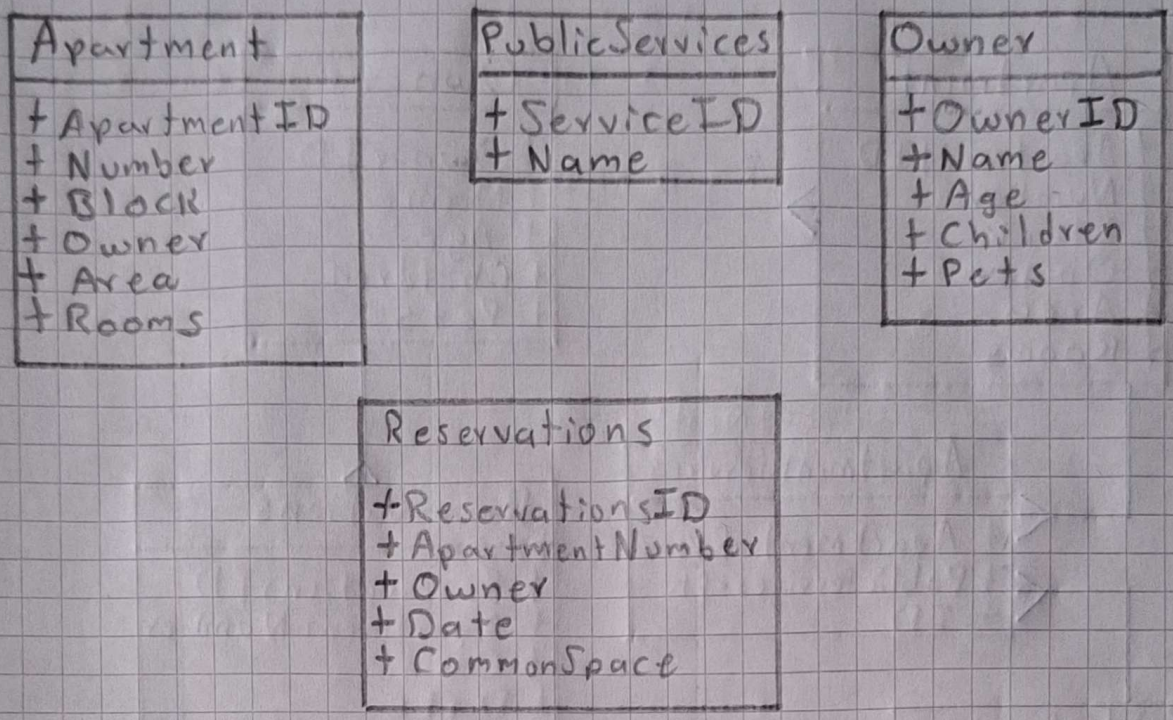
Owner
Alex Van Halen
Chad Smith
Neil Pearl
Chad Smith

c) $\Pi_{ReservationsID, CommonSpace}(Reservations)$

ReservationID	CommonSpace
1	Soccer Field
2	Pool
3	Gym
4	Pool
5	Soccer Field
6	Gym
7	Pool
8	Gym
9	Soccer Field
10	Pool

4.

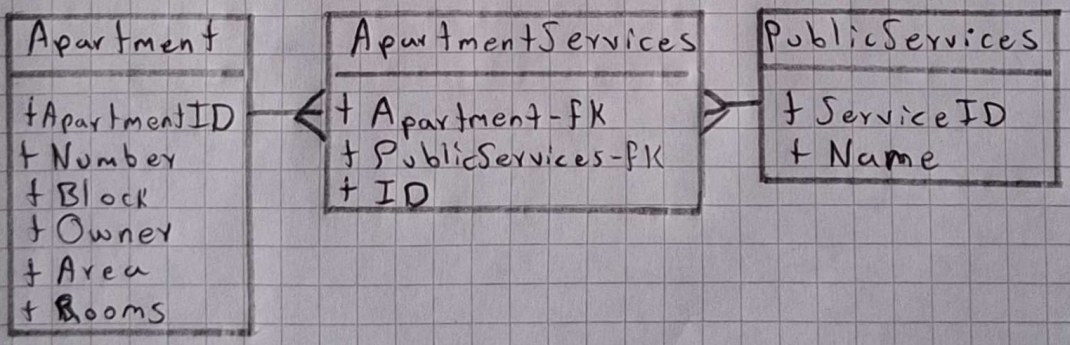
a) Entities:



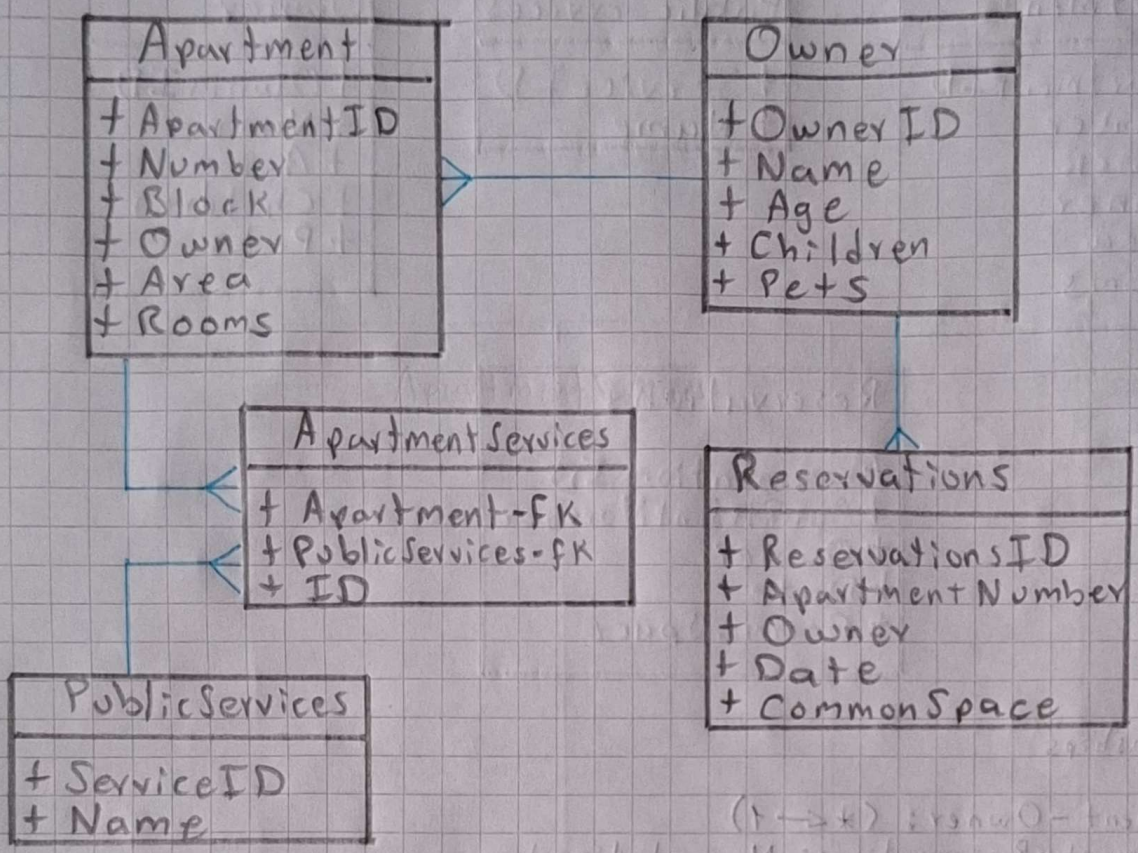
b) Relationships

-> Apartment - Owner: (* <- 1)
-> Apartment - Reservations: No relationship
-> Apartment - PublicServices: (* -> *)
-> Owner - Reservations: (1 -> *)

c) split many-to-many relationship



d) Draw


Apartment
+ ApartmentID
+ Number
+ Block
+ Owner
+ Area
+ Rooms
Owner
+ OwnerID
+ Name
+ Age
+ Children
+ Pets
ApartmentServices
+ Apartment-FK
+ PublicServices-FK
+ ID
Reservations
+ ReservationsID
+ ApartmentNumber
+ Owner
+ Date
+ CommonSpace
PublicServices
+ ServiceID
+ Name