Workshop #2. Relational Algebra

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1. Based on the table Apartment shows as follows

ApartmentID	Number	Block	Owner	Area	Rooms
1	101	1	Chad Smith	45	2
2	102	3	Neil Pearl	60	3
3	103	1	Alex Van Halen	75	3
4	304	2	Eddie Van Halen	30	1
5	305	3	David Lee Roth	50	2
6	306	1	Sammy Hagar	70	3
7	207	2	Michael Anthony	40	2
8	308	3	Gary Cherone	55	2
9	409	1	Wolfgang Van Helen	65	3
10	310	2	Valerie Bertinelli	80	3

a) Show the number of the apartments with more than 50 Area:

102, 103, 306, 308, 409, 310

b) Show the number and Owner of the apartments with more than 2 rooms and less than 4 rooms

102 - Neil Pearl, 103 - Alex Van Halen, 306 - Sammy Hagar,
409 - Wolfgang Van Helen, 310 - Valerie Bertinelli

c) Show the number, Owner and Area of the apartments with more than 40 Area and less than 70 Area

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

d) Show all rows of the table Apartment where the Owner contains the word Van Halen, and called VanHelen Apartments

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

e) Using next table called PublicServices, show the Number of the apartments with more than 60 Area with all the PublicServices available

ServiceID	Name		Number	ServiceID	Name
1	Water		1 0 3	1	Water
2	Electricity		1 0 3	2	Electricity
3	Gas		1 0 3	3	Gas
			3 0 6	1	Water
			3 0 6	2	Electricity
			3 0 6	3	Gas
			4 0 9	1	Water
			4 0 9	2	Electricity
			4 0 9	3	Gas
			3 1 0	1	Water
			3 1 0	2	Electricity
			3 1 0	3	Gas

2. Based on the table Owner shows as follows

Owner ID	Name	Age	Children	Pets
1	Chad Smith	~~50~~ 50	2	1
2	Neil Pearl	45	1	0
3	Alex Van Helen	60	3	2
4	Eddie Van Helen	58	2	1
5	David Lee Roth	55	1	0
6	Sammy Hagar	65	2	1
7	Michael Anthony	70	3	2
8	Gary Cherone	40	1	0
9	Wolfgang Van Helen	30	0	0
10	Valerie Bertinelli	65	2	1

a) Show the Name of the Owners with more than 50 Age

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

b) Show the Name and Age of the owners with more than 1 Children and less than 3 Children

Name	Age
Chad Smith	5 0
Eddie Van Helen	6 0
Summy Hagar	6 5
Valerie Batinelli	6 5

c) Show the Name, Age and Children of the of the owners with more than 40 Age and less than 60 Age

Name	Age	Children
Chad Smith	5 0	2
Neil Pearl	4 5	1
Eddie Van Helen	5 8	2
David Lee Roth	5 5	1

d) Show all rows of the table Owner where there is a ar or ar substring in the Name, and called R Owners

OwnerID	Name	Age	Children	Pets
2	Neil Pearl	4 5	1	0
6	Summy Hagar	6 5	2	1
8	Gary Cherone	4 0	1	0

e) Show the Name of the owners with more than 1 pets and less than 2 Children

Name
Null

3. Based on the table Reservations show as follows

ReservationsID	ApartmentNumber	Owner	Date	CommonSpace
1	101	Chad Smith	2024-01-01	Soccer Field
2	102	Neil Pearl	2024-01-02	Pool
3	101	Chad Smith	2024-01-02	Gym
4	103	Alex Van Halen	2024-01-03	Pool
5	102	Neil Pearl	2024-01-02	Soccer Field
6	103	Alex Van Halen	2024-01-04	Gym
7	101	Chad Smith	2024-01-05	Pool
8	102	Neil Pearl	2024-01-06	Gym
9	103	Alex Van Halen	2024-01-07	Soccer Field
10	101	Chad Smith	2024-01-08	Pool

a) Show the ApartmentNumber, Owner and CommonSpace of the Reservation with Date 2020-01-01 and called New Year Reservation

ApartmentNumber	Owner	CommonSpace
Null	Null	Null

b) Show the Owner of the Reservations after 2024-01-02 date, and the CommonSpace is pool or the ApartmentNumber is 104 or the ApartmentNumber is 102

Owner
Alex Van Helen
Chad Smith
Neil Pearl
Chad Smith

c) Show the Reservation ID and CommonSpace of the Reservation

Reservation ID	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. Based on the tables showed above, create an ER Diagram to show the relationships between the tables.

Apartment
+ ApartmentID: int
+ Number: int
+ Block: int
+ Owner: ownerID_FX
+ Area: int
+ Rooms: int

Owner
+ OwnerID_PK: int
+ Name: String
+ Age: int
+ Children: int
+ Pets: int

PublicServices
+ Name: String
+ ServiceID: int

Apartment - PublicServices
+ ServiceID_FK: int
+ ApartmentID_FK: int

Reservation
+ ReservationID: int
+ ApartmentNumber: int
+ Owner_FK: String
+ Date: date
+ CommonSpace: String