

Databases Foundations
Season 2024-III
Workshop No. 2 — Relational Algebra

Eng. Carlos Andrés Sierra, M.Sc.
Computer Engineering
Universidad Distrital Francisco José de Caldas

Congratulations, you survive at your first challenge. Now, it is time to keep pushing you because *you could give more*. As you understand how to design a relational database in a **first but professional version**, your next challenge is to define ways to extract **meaningful information** using **relational algebra**.

In this second challenge, *ApartaApp* wants to see some information about the use of **its software** *The design you made for the first workshop*. In this way, for each one of the next **requirements** you must write the *relational algebra expression* and draw the result table to validate your solution.

ApartaApp asked you to deliver a document with the **queries** and the **result tables**, described as follows:

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 Halen	65	3
10	310	2	Valerie Bertinelli	80	3

Carlos Andrés Sierra, Computer Engineer, M.Sc. on Computer Engineering, Titular Professor at Universidad Distrital Francisco José de Caldas.

Any comment or concern related to this document could be sent to Carlos A. Sierra at e-mail: *cavir-guezs@udistrital.edu.co*

- (a) Show the *Number* of the apartments with more than 50 *Area*.
- (b) Show the *Number* and *Owner* of the apartments with more than 2 *Rooms* and less than 4 *Rooms*.
- (c) Show the *Number*, *Owner* and *Area* of the apartments with more than 40 *Area* and less than 70 *Area*.
- (d) Show all rows of the table **Apartment** where the *Owner* contains the word *Van Halen*, and called **VanHalenApartments**.
- (e) Using next table called **PublicServices**, show the *Number* of the apartments with more than 60 *Area* with all the *PublicServices* available.

ServiceID	Name
1	“Water”
2	“Electricity”
3	“Gas”

2. Based on the table **Owner** shows as follows:

OwnerID	Name	Age	Children	Pets
1	Chad Smith	50	2	1
2	Neil Pearl	45	1	0
3	Alex Van Halen	60	3	2
4	Eddie Van Halen	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 Halen	30	0	0
10	Valerie Bertinelli	65	2	1

- (a) Show the *Name* of the owners with more than 50 *Age*.
 - (b) Show the *Name* and *Age* of the owners with more than 1 *Children* and less than 3 *Children*.
 - (c) Show the *Name*, *Age* and *Children* of the of the owners with more than 40 *Age* and less than 60 *Age*.
 - (d) Show all rows of the table **Owner** where there is a *ar* or *ar* substring in the *Name*, and called **R Owners**.
 - (e) Show the *Name* of the owners with more than 1 *Pets* and less than 2 *Children*.
3. Based on the table **Reservations** shows as follows:
 - (a) Show the *ApartmentNumber*, *Owner* and *CommonSpace* of the Reservations with Date 2020 – 01 – 01 and called **NewYearReservations**.

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

- (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.
 - (c) Show the *ReservationsID* and *CommonSpace* of the Reservations.
4. Based on the tables showed above, create an *ER Diagram* to show the relationships between the tables. If you think you need an additional entity you could add it.

Deadline: **Saturday, October 5, 2024, 4:00 PM.**