Study stream : Computer Science
Level: 2nd Year Bachelor's Degree
Module: DataBase
Instructor: Dr. Bouneb M.

Tutorial N°03

Objective: Understand Relational Algebra

☞ *Understand set operations:*

- *Union*
- *Intersection*
- *Difference*

☞ *Understand specific operations:*

- *Projection*
- *Selection (Restriction)*
- *Join*
- *Division*

Exercise 01 :

Given the following relations in extension:

Film:

Num-Film	Title	Duration	Production	ID-Category
10	Camille claudel	150	Gaumont	COM
20	Window to the heart	120	Pathé	COM
25	Cinderella	140	UGC	CAR
50	Super world II	10	Universal	DOCU
……….	………………..	………….…...	…………….…....	……….……..

Category:

ID-Category	Category-Label

COM	Comedy
CAR	Cartoon
DOCU	Documentary
………	………

Q1. Provide the titles of existing films.

Q2. Which films were produced by Pathé?

Q3. We would like to obtain the titles of the films as well as the labels of their categories.

Q4. Provide the number, titles of the films, and labels of their categories only for films longer than 100 minutes.

Exercise 2:

Given the following relational schemas:

- PILOT (Numpil, Name-pil, Adr, Sal)
- PLANE (Num-plane, Name-plane, Cap, Loc)
- FLIGHT (#Num-FL, #Numpil, #Num-plane, City_Dep, City_Arr, H_Dep, H_Arr)

Q1. List the planes with a capacity greater than 350 passengers.

Q2. Provide the numbers and names of planes located in Constantine.

Q3. Provide the numbers of pilots on duty and the departure cities of their flights.

Q4. Provide all the information about the pilots in the company and their flights.

Q5. Which pilots residing in Algiers have a salary greater than 220,000 DA?

Q6. Which planes (number and name) are located in Constantine or have a capacity less than 350 passengers?

Q7. Provide a list of flights departing from Constantine to Algiers after 6 PM.

Q8. Provide the numbers of pilots who are not on duty.

Q9. Which flights (number, departure city) are conducted by pilots numbered 100 or 204?

Q10. Provide the numbers of flights departing from Constantine with pilots from Constantine.

Q11. Which flights are conducted with a plane that is not located in Constantine?

Q12. Which pilots (number and name) conduct at least one flight departing from Constantine with a plane of capacity greater than 300 seats?

Q13. Which pilots residing in Algiers with a salary over 220,000 DA conduct a flight departing from Constantine with an Airbus?

Q14. Provide the numbers of flights departing from or arriving in Constantine with a plane located in Algiers.

Q15. Which pilots (number, name) live in the same city as pilot Ali?

Q16. Provide the numbers of pilots on duty other than Ali.

Q17. Which cities are served from the destination city of a flight departing from Algiers?

Q18. Which planes (their numbers) are located in the same city as plane number 100?

Q19. Which pilots (numbers and names) reside in the same city as pilot Ali and earn a salary greater than his?

Q20. Which pilots (numbers and names) conduct a flight departing from their city of residence?

Exercise 3:

Consider the "cinema" database with the following relational schema:

- *CITY (PostalCode, CityName)*
- *CINEMA (CinemaNum, CinemaName, Address, #PostalCode)*
- *ROOM (RoomNum, Capacity, #CinemaNum)*
- *FILM (ExploitationNum, Title, Duration, DistCode)*
- *SCREENING (#ExploitationNum, #CinemaNum , #RoomNum, WeekNum, NB-Entry)*

Q1. Provide Titles of films lasting at least two hours.

Q2. Provide Names of cities hosting a cinema named "Elmodjahed."

Q3. Provide Names of cinemas located in Oran or having at least one room with more than 100 seats.

Q4. Provide Names, addresses, and cities of cinemas showing the film "Star Wars" in week 18.

Q5. Provide Exploitation numbers of films shown in all rooms.

Q6. Provide Titles of films that have not been shown.