

## ***Solution Tutorial N°6:***

### ***Exercise 01 :***

*Here are the SQL commands to address each question:*

#### ***1. Create the physical data model***

```
CREATE TABLE Student (  
    Num INT,  
    LastName_S VARCHAR(50),  
    FirstName_S VARCHAR(50),  
    BirthDate DATE,  
    PRIMARY KEY Num,  
    FOREIGN KEY (ThesisNum) REFERENCES Thesis(ThesisNum)  
);
```

```
CREATE TABLE Teacher (  
    Code INT,  
    LastName_T VARCHAR(50),  
    FirstName_T VARCHAR(50),  
    Specialty VARCHAR(50),  
    PRIMARY KEY Code  
);
```

```
CREATE TABLE Thesis (  
    ThesisNum INT,  
    Title VARCHAR(255),  
    Specialty VARCHAR(50),  
    PRIMARY KEY ThesisNum  
);
```

```
CREATE TABLE Session (  
    SessionNum INT,  
    StartDate DATE,  
    EndDate DATE,
```

*PRIMARY KEY SessionNum*  
);

*CREATE TABLE Defense (*  
*DefenseNum INT,*  
*ThesisNum INT,*  
*SessionNum INT,*  
*Decision VARCHAR(50),*  
*Mention VARCHAR(50),*  
*PRIMARY KEY DefenseNum,*  
*FOREIGN KEY (ThesisNum) REFERENCES Thesis(ThesisNum),*  
*FOREIGN KEY (SessionNum) REFERENCES Session(SessionNum)*  
);

**2. Add the column *DefenseDate* to the *Defense* table**

*ALTER TABLE Defense ADD COLUMN DefenseDate DATE;*

**3. Add the column *Rank* to the *Teacher* table**

*ALTER TABLE Teacher ADD COLUMN Rank VARCHAR(50);*

**4. Delete the table *Teacher***

*DROP TABLE Teacher;*

**5. Modify the title of the thesis with number 410**

*UPDATE Thesis*  
*SET Title = 'Development of an E-commerce Website'*  
*WHERE ThesisNum = 410;*

**6. Assign the mention "Excellent" to all theses defended in session number 2**

*UPDATE Defense*  
*SET Mention = 'Excellent'*  
*WHERE SessionNum = 2;*

**Exercise 02 :**

**1. List all planes with a capacity greater than 350 passengers**

*SELECT Num-plane, Name-plane*  
*FROM PLANE*  
*WHERE Cap > 350;*

**2. What are the numbers and names of planes located in Constantine?**

```
SELECT Num-plane, Name-plane
FROM PLANE
WHERE Loc = 'Constantine';
```

**3. What are the numbers of pilots on duty and the departure cities of their flights?**

```
SELECT DISTINCT FLIGHT.Numpil, FLIGHT.City_Dep
FROM FLIGHT ;
```

**4. Provide all information about the pilots in the company.**

```
SELECT Numpil, Name-pil, Adr, Sal, Num-FL, Num-plane, City_Dep, City_Arr, H_Dep,
H_Arr
FROM PILOT
INNER JOIN FLIGHT ON PILOT.Numpil = FLIGHT.Numpil;
```

**5. What are the names of pilots residing in Algiers with a salary greater than 220,000 DA?**

```
SELECT Name-pil
FROM PILOT
WHERE Adr = 'Algiers' AND Sal > 220000;
```

**6. What are the planes (number and name) located in Constantine or with a capacity less than 350 passengers?**

```
SELECT Num-plane, Name-plane
FROM PLANE
WHERE Loc = 'Constantine' OR Cap < 350;
```

**7. List all flights departing from Constantine to Algiers after 6:00 PM.**

```
SELECT Num-FL
FROM FLIGHT
WHERE City_Dep = 'Constantine' AND City_Arr = 'Algiers' AND H_Dep > '18:00:00';
```

**8. What are the numbers of pilots who are not on duty?**

```
SELECT Numpil
```

*FROM PILOT*

*WHERE Numpil NOT IN (SELECT Numpil FROM FLIGHT);*

- 9. What are the flights (number, departure city) performed by pilots with numbers 100 and 204?**

*SELECT Num-FL, City\_Dep*

*FROM FLIGHT*

*WHERE Numpil IN (100, 204);*

- 10. Provide the numbers of flights departing from Constantine performed by pilots residing in Constantine.**

*SELECT Num-FL*

*FROM PILOT*

*INNER JOIN FLIGHT ON PILOT.Numpil = FLIGHT.Numpil*

*Where FLIGHT.City\_Dep = 'Constantine' AND PILOT.Adr = 'Constantine';*

- 11. What are the flights performed by a plane that is not located in Constantine?**

*SELECT Num-FL*

*FROM FLIGHT*

*INNER JOIN PLANE ON FLIGHT.Num-plane= Plane.Num-plane*

*WHERE Loc < > 'Constantine';*

- 12. What are the pilots (number and name) ensuring at least one flight departing from Constantine with a plane of capacity greater than 300 seats?**

*SELECT DISTINCT Numpil, Name-pil*

*FROM PILOT*

*INNER JOIN (FLIGHT INNER JOIN PLANE ON FLIGHT.Num-plane = PLANE.Num-plane) ON PILOT.Numpil = FLIGHT.Numpil*

*WHERE FLIGHT.City\_Dep = 'Constantine' AND PLANE.Cap > 300;*

- 13. What are the names of pilots residing in Algiers with a salary greater than 220,000 DA and ensuring a flight departing from Constantine with an Airbus?**

```

SELECT DISTINCT Numpil, Name-pil
FROM PILOT
INNER JOIN (FLIGHT INNER JOIN PLANE ON FLIGHT.Num-plane = PLANE.Num-
plane) ON PILOT.Numpil = FLIGHT.Numpil
WHERE PILOT.Adr= 'Algiers' AND PILOT.Sal >220000 AND FLIGHT.City_Dep =
'Constantine' AND PLANE.Name-plane= 'Airbus' ;

```

**14. What are the flight numbers performed either departing from or arriving in Constantine with a plane located in Algiers?**

```

SELECT FLIGHT.Num-FL
FROM FLIGHT
INNER JOIN PLANE ON FLIGHT. Num-plane = PLANE.Num-plane
WHERE (FLIGHT.City_Dep = 'Constantine' OR FLIGHT.City_Arr = 'Constantine') AND
PLANE.Loc = 'Algiers';

```

**15. What are the pilots (number, name) living in the same city as the pilot named Ali?**

```

SELECT Num-pil, Name-pil
FROM PILOT WHERE Adr IN (SELECT Adr FROM PILOT WHERE Name-pil= 'Ali') ;

```

**16. What are the numbers of pilots on duty different from that of Ali?**

```

SELECT Num-pil
FROM PILOT
INNER JOIN FLIGHT ON PILOT.Numpil = FLIGHT.Numpil
WHERE Name-pil <> 'Ali' ;

```

**17. What are the cities served from the arrival city of a flight departing from Algiers?**

```

SELECT City_Dep
FROM FLIGHT
WHERE City_Dep IN (SELECT City_Arr FROM FLIGHT WHERE City_Dep='Algiers')
;

```

**18. What are the planes (their numbers) located in the same city as the plane with number 100?**

```
SELECT Num-plane  
FROM PLANE  
WHERE Loc in (SELECT Loc FROM PLANE WHERE Num-plane=100) ;
```

**19. What are the numbers and names of pilots residing in the same city as the pilot Ali and earning a salary higher than Ali's?**

```
SELECT P1.Numpil, P1.Name-pil  
FROM PILOT P1  
JOIN PILOT P2 ON P1.Adr = P2.Adr  
WHERE P2.Name-pil = 'Ali' AND P1.Sal > P2.Sal;
```

**Or the following solution:**

```
SELECT Num-pil, Name-pil  
FROM PILOT WHERE Adr IN (SELECT Adr FROM PILOT WHERE Name-pil= 'Ali' )  
AND Sal > (SELECT Sal FROM PILOT WHERE Name-pil= 'Ali' );
```

**20. What are the numbers and names of pilots who perform a flight departing from their city of residence?**

```
SELECT PILOT.Num-pil, PILOT.Name-pil  
FROM PILOT  
INNER JOIN FLIGHT ON PILOT.Numpil = FLIGHT.Numpil  
WHERE PILOT.Adr= FLIGHT.City_Dep;
```

**Exercise 03:**

**1. Titles of films with a duration greater than or equal to two hours.**

```
SELECT Title  
FROM FILM  
WHERE Duration >= 120;
```

**2. Names of cities hosting a cinema named "Elmodjahed."**

```
SELECT CITY.CityName
FROM CITY
INNER JOIN CINEMA ON CITY.CodePostal = CINEMA.#CodePostal
WHERE CINEMA.CinemaName = 'Elmodjahed';
```

**3. Names of cinemas located in Oran or containing at least one room with more than 100 seats.**

```
SELECT CINEMA.CinemaName
FROM CITY INNER JOIN( CINEMA LEFT JOIN ROOM ON CINEMA.CinemaNum
= ROOM.CinemaNum )ON CITY.CodePostal = CINEMA.CodePostal
WHERE CITY.CityName='Oran' OR ROOM.Capacity>100
```

**4. Name, address, and city of cinemas where the film "Famous Star" is playing during week 18.**

```
SELECT CINEMA.CinemaName, CINEMA.Address, CITY.CityName
FROM CITY
INNER JOIN ( CINEMA INNER JOIN (ROOM INNER JOIN (SCREENING INNER
JOIN FILM ON SCREENING.ExploitationNum = FILM.ExploitationNum) ON
ROOM.RoomNum = SCREENING.RoomNum) ON CINEMA.CinemaNum =
ROOM.CinemaNum) ON CINEMA.CodePostal = CITY.CodePostal
WHERE FILM.Title = 'Famous Star' AND SCREENING.WeekNum = 18;
```

**5. Exploitation numbers of films screened in all rooms.**

```
SELECT ExploitationNum
FROM SCREENING
INNER JOIN ( ROOM INNER JOIN CINEMA ON ROOM.CinemaNum =
CINEMA.CinemaNum)
ON SCREENING.RoomNum= ROOM.RoomNum
GROUP BY ExploitationNum, CinemaNum, RoomNum
HAVING (COUNT(RoomNum)) = (SELECT (COUNT(RoomNum))
FROM ROOM
```

*ORDER BY CinemaNum, RoomNum)*

**6. Titles of movies that have not been screened.**

```
SELECT Title  
FROM FILM  
WHERE FILM.ExploitationNum NOT IN (SELECT ExploitationNum FROM  
SCREENING)
```

**Exercise 04:**

**1. Provide the total quantity of products ordered.**

```
SELECT SUM(Quantity)  
FROM ORDER
```

**2. What is the value of the largest quantity ordered?**

```
SELECT MAX(Quantity)  
FROM ORDER
```

**3. What are the order numbers that require an additional quantity of 50 products to exceed 100 products?**

```
SELECT OrderNum  
FROM ORDER  
WHERE Quantity < 100 AND (Quantity + 50) > 100
```