

HW 2 – DATA BASES

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Question 1:

```
-- 1. Names of physicians who were on duty on 01/01/2011
SELECT p.first_name, p.last_name
FROM Physicians p
JOIN Shifts s ON p.physician_id = s.physician_id
WHERE s.date = '2011-01-01';

-- 2. Details of the physicians (physician ID, first name, last name) who were on
duty on 01/01/2011 and started to work at 13:00
SELECT p.physician_id, p.first_name, p.last_name
FROM Physicians p
JOIN Shifts s ON p.physician_id = s.physician_id
WHERE s.date = '2011-01-01' AND s.start_time = '13:00';

-- 3. Show the expertise domain of the physicians "Dana" and "Alice"
SELECT e.expertise
FROM Expertise e
JOIN Physicians p ON e.physician_id = p.physician_id
WHERE p.first_name IN ('Dana', 'Alice');

-- 4. Show the physician's details (physician ID, first name, last name) who has the
most expertise domains
SELECT p.physician_id, p.first_name, p.last_name
FROM Physicians p
JOIN Expertise e ON p.physician_id = e.physician_id
GROUP BY p.physician_id, p.first_name, p.last_name
ORDER BY COUNT(*) DESC
LIMIT 1;

-- 5. Show the patient (patient ID, first name, last name) who received the most
(different) treatments
SELECT pt.patient_id, pt.first_name, pt.last_name
FROM Patients pt
JOIN Patient_Treatments ptmt ON pt.patient_id = ptmt.patient_id
GROUP BY pt.patient_id, pt.first_name, pt.last_name
ORDER BY COUNT(DISTINCT ptmt.treatment_code) DESC
LIMIT 1;

-- 6. Details of the patients (patient ID, first name, last name) who received more
than three different treatments
SELECT pt.patient_id, pt.first_name, pt.last_name
FROM Patients pt
JOIN Patient_Treatments ptmt ON pt.patient_id = ptmt.patient_id
GROUP BY pt.patient_id, pt.first_name, pt.last_name
HAVING COUNT(DISTINCT ptmt.treatment_code) > 3;
```

```
-- 7. Details of the patients (patient ID, first name, last name) who did not
receive any treatment
SELECT p.patient_id, p.first_name, p.last_name
FROM Patients p
LEFT JOIN Patient_Treatments pt ON p.patient_id = pt.patient_id
WHERE pt.patient_id IS NULL;

-- 8. Details of patients who have not made any progress in their treatment (no
comment in the Patient progress table)
SELECT p.patient_id, p.first_name, p.last_name
FROM Patients p
LEFT JOIN Patient_Progress pp ON p.patient_id = pp.patient_id
WHERE pp.patient_id IS NULL;

-- 9. The patient in whose condition the most progress has been made (appears most
often in the comments in the Patient progress table)
SELECT p.patient_id, p.first_name, p.last_name
FROM Patients p
JOIN Patient_Progress pp ON p.patient_id = pp.patient_id
GROUP BY p.patient_id, p.first_name, p.last_name
ORDER BY COUNT(*) DESC
LIMIT 1;

-- 10. Add a new record to the patient progress table (details as you wish)
INSERT INTO Patient_Progress (patient_id, treatment_code, physician_id,
initial_status_description, current_status_description, treatment_end_date)
VALUES ('123', 'ABC', '456', 'Initial status', 'Current status', '2023-06-10');

-- 11. Update the degree of an employee whose patient ID is '222' to 'Phd'
UPDATE Physicians
SET degree = 'Phd'
WHERE physician_id = '222';
```

Question 2:

π - projection
 σ - selection

1 - π first-name, last-name (σ date=1/1/2011 (Shirts \bowtie Physicians))

2 - π physician-id, shirt-number, last-name (Physicians \bowtie (σ date=1/1/2011, shirt-number=1111 (Shirts)))

3 - π patients.first-name, patients.last-name, Test.test-name (Patients \bowtie Patient-Tests \bowtie Tests | Patients-Tests.test-date=1/1/2011)

4 - π expertise (σ first-name=Dana \vee first-name=Alia (Expertise \bowtie Physicians))

5 - Define two variables:

expertise-count = γ Expertise, physician-id (Expertise \rightarrow max(count(Expertise)))

physician-expertise = Physicians \bowtie Expertise

= Return the next expression:

π physician.physician-id, physician.first-name, physician.last-name (physician-expertise \bowtie expertise-count)

6 - π (Patients \bowtie (PatientTests \div PatientTreatments))
patients.physician-id,
patients.first-name,
patients.last-name

7 - Define two variables:

PatientCount = γ PatientTreatments.physician-id (PatientTreatments \rightarrow max(count(distinct patient-id)))

Physician-Patient-Join = Physicians \bowtie PatientCount

Return the next expression:

π physician.physician-id, physician.first-name, physician.last-name (Physician-Patient-Join)

Question 3:

-- 1. Names of physicians who were on duty on 01/01/2011

```
SELECT p.first_name, p.last_name
FROM Physicians p
JOIN Shifts s ON p.physician_id = s.physician_id
WHERE s.date = '2011-01-01';
```

-- 2. Details of the physicians (physician ID, first name, last name) who were on duty on 01/01/2011 and started to work at 13:00

```
SELECT p.physician_id, p.first_name, p.last_name
FROM Physicians p
JOIN Shifts s ON p.physician_id = s.physician_id
WHERE s.date = '2011-01-01' AND s.start_time = '13:00';
```

-- 3. Show the expertise domain of the physicians "Dana" and "Alice"

```
SELECT e.expertise
FROM Expertise e
JOIN Physicians p ON e.physician_id = p.physician_id
WHERE p.first_name IN ('Dana', 'Alice');
```

-- 4. Show the physician's details (physician ID, first name, last name) who has the most expertise domains

```
SELECT p.physician_id, p.first_name, p.last_name
FROM Physicians p
JOIN Expertise e ON p.physician_id = e.physician_id
GROUP BY p.physician_id, p.first_name, p.last_name
ORDER BY COUNT(*) DESC
LIMIT 1;
```

-- 5. Show the patient (patient ID, first name, last name) who received the most (different) treatments

```
SELECT pt.patient_id, pt.first_name, pt.last_name
FROM Patients pt
JOIN Patient_Treatments ptmt ON pt.patient_id = ptmt.patient_id
GROUP BY pt.patient_id, pt.first_name, pt.last_name
ORDER BY COUNT(DISTINCT ptmt.treatment_code) DESC
LIMIT 1;
```

-- 6. Details of the patients (patient ID, first name, last name) who received more than three different treatments

```
SELECT pt.patient_id, pt.first_name, pt.last_name
FROM Patients pt
JOIN Patient_Treatments ptmt ON pt.patient_id = ptmt.patient_id
GROUP BY pt.patient_id, pt.first_name, pt.last_name
HAVING COUNT(DISTINCT ptmt.treatment_code) > 3;
```

-- 7. Details of the patients (patient ID, first name, last name) who did not receive any treatment

```
SELECT p.patient_id, p.first_name, p.last_name
FROM Patients p
LEFT JOIN Patient_Treatments pt ON p.patient_id = pt.patient_id
WHERE pt.patient_id IS NULL;
```

-- 8. Details of patients who have not made any progress in their treatment (no comment in the Patient progress table)

```
SELECT p.patient_id, p.first_name, p.last_name
FROM Patients p
LEFT JOIN Patient_Progress pp ON p.patient_id = pp.patient_id
```

```
WHERE pp.patient_id IS NULL;
```

```
-- 9. The patient in whose condition the most progress has been made (appears most  
often in the comments in the Patient progress table)
```

```
SELECT p.patient_id, p.first_name, p.last_name  
FROM Patients p  
JOIN Patient_Progress pp ON p.patient_id = pp.patient_id  
GROUP BY p.patient_id, p.first_name, p.last_name  
ORDER BY COUNT(*) DESC  
LIMIT 1;
```

```
-- 10. Add a new record to the patient progress table (details as you wish)
```

```
INSERT INTO Patient_Progress (patient_id, treatment_code, physician_id,  
initial_status_description, current_status_description, treatment_end_date)  
VALUES ('123', 'ABC', '456', 'Initial status', 'Current status', '2023-06-10');
```

```
-- 11. Update the degree of an employee whose patient ID is '222' to 'Phd'
```

```
UPDATE Physicians  
SET degree = 'Phd'  
WHERE physician_id = '222';
```