

Homework #1

Exercises on SQL Language

1. Given the following relational schema (primary keys are underlined, optional attributes are denoted as '*'):

USER (SSN, Name, Surname, City, YearOfBirth, UserType)
MOVIE (MCode, Title, Nation, Language, MovieStudio, Genre)
EVALUATION (SSN, MCode, Evaluation, Date)

Write the following queries in SQL language:

- Show the code and title of every movie produced by the film studio 'BestMovie' that has received an average rating of over 8 from teenage users (UserType = 'Teenager').

```
SELECT M.MCode, M.Title
FROM MOVIE M, USER U, EVALUATION E
WHERE M.MovieStudio = 'BestMovie' AND U.UserType = 'Teenager'
AND E.SSN=U.SSN AND E.MCode = M.MCode
GROUP BY M.MCode, M.Title
HAVING AVG(E.Evaluation) > 8
```

Alternative solution:

```
SELECT M.MCode, M.Title
FROM MOVIE M
WHERE M.MovieStudio='BestMovie'
AND M.MCode IN
    (SELECT E.MCode
     FROM EVALUATION E, USER U
     WHERE U.UserType = 'Teenager' AND E.SSN = U.SSN
     GROUP E.MCode
     HAVING AVG(E.Evaluation) > 8)
```

2. Given the following relational schema (primary keys are underlined, optional attributes are denoted as '*'):

TRAINER (SSN, TName, TSurname, TCity)
GYM (GCode, GName, GCity, Address)
SPECIALTY (SCode, SName, Description)
LESSON (SSN, GCode, Date, SCode, ParticipantsNumber)

Write the following queries in SQL language:

- a) Show SSN, name and surname of every personal trainer who gave lessons in at least 3 different gyms located in Turin.

```
SELECT T.SSN, T.TName, T.TSurname
FROM TRAINER T, GYM G, LESSON L
WHERE G.City = 'Torino' AND G.GCode=L.GCode AND T.SSN = L.SSN
GROUP BY T.SSN, T.TName, T.TSurname
HAVING COUNT (DISTINCT L.GCode) >=3
```

Alternative solution:

```
SELECT T.SSN, T.Name, T.Surname
FROM TRAINER T
WHERE T.SSN IN
  (SELECT L.SSN
   FROM LESSON L, GYM G
   WHERE G.GCity = 'Torino' AND L.GCode = G.GCode
   GROUP BY L.SSN
   HAVING COUNT (DISTINCT L.GCode) >=3)
```

- b) Show SSN and surname of every personal trainer who gave at least 10 lessons on Karate, but who never gave lessons on Judo

```
SELECT T.SSN, TSurname
FROM TRAINER T, SPECIALITY S, LESSON L
WHERE S.SName = 'Karate' AND S.SCode = L.SCode AND T.SSN = L.SSN
AND T.SSN NOT IN
    (SELECT L.SSN
     FROM SPECIALITY S, LESSON L
     WHERE S.SName = 'Judo' AND S.SCode=L.SCode)
GROUP BY T.SSN, T.TSurname
HAVING COUNT (*) >=10
```

Alternative solution:

```
SELECT T.SSN, T.TSurname
FROM TRAINER T
WHERE T.SSN IN
    (SELECT L.SSN
     FROM SPECIALITY S, LESSON L
     WHERE S.SName = 'Karate' AND S.SCode=L.SCode
     GROUP BY L.SSN
     HAVING COUNT (*) >=10)
AND T.SSN NOT IN
    (SELECT L.SSN
     FROM SPECIALITY S, LESSON L
     WHERE S.SName = 'Judo' AND S.SCode=L.SCode)
```

- c) For each gym, show the name and the total number of lessons given by personal trainers who gave lessons in at least 3 different gyms located in Turin.

```
SELECT G.GName, COUNT(*)
FROM GYM G, LESSON L
WHERE G.GCode=L.GCode
AND L.SSN IN (SELECT L.SSN
              FROM GYM G, LESSON L
              WHERE G.City = 'Torino' AND G.GCode=L.GCode
              GROUP BY L.SSN
              HAVING COUNT (DISTINCT L.GCode) >=3)
GROUP BY G.GCode, G.GName
```