

Introduction to Databases

Homework no. 1: Relational algebra

1. The following relations are given (primary keys are underlined):

```
BRANCH(BCode, BName, Main-Sector)
MANAGER(MCode, MName, Surname, DateOfBirth, BCode, EnrolmentDate)
COMPANY(CCode, CName, CompanyType, City, Industrial-Sector)
CONSULTING-ACTIVITY(MCode-TechnicalCoordinator, CCode, StartDate, Duration, Amount)
```

Write the following query in relational algebra

- (a) Show both the code and the surname of the managers who have been the technical coordinators of at least two consulting activities lasting 8 months or more for companies working in the same industrial sector.

2. The following relations are given (primary keys are underlined):

```
STUDENT(StudentID, Name, Surname, DegreeProgramme)
ASSIGNMENT_TO_BE_DELIVERED(ACode, Title, Topic, ScheduledExpirationDate)
TEACHER(TeacherID, Name, Surname, Department)
EVALUATION_OF_DELIVERED_ASSIGNMENT(StudentID, ACode, TeacherID,
                                   DeliveryDate, EvaluationDate, Score)
```

Write the following query in relational algebra

- (a) Show the identifier and surname of the students of the "Computer Science Engineering" degree programme who have *always* delivered their assignments at least 15 days before the scheduled expiration date.
- (b) Show the identifier and surname of the students who have delivered *all* assignments.

3. The following relations are given (primary keys are underlined):

```
ATHLETE(ACode, AName, DateOfBirth, CityOfResidence)
TOURNAMENT(TCode, TName, Level, OrganizingAssociation)
RACE(RCode, RName, TCode, Date, CityOfRace)
ATHLETE-PARTICIPATES-IN-RACE(ACode, RCode, Ranking)
```

Write the following query in relational algebra

- (a) Show the code and the name of each athlete who has *never* participated in races held in the city where she/he resides.