

Introduction to Databases

Homework no. 1: Relational algebra

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

```
DANCER(SSN, Name, DateOfBirth, CityOfResidence, MainDanceType)
DANCE_SCHOOL(DSCode, Name, City, Artistic_Director)
BALLET(BCode, DSCode, Title, #Scene, Type, Choreographer_Name)
DANCER-PARTICIPATES-IN-BALLET(SSN, BCode, DSCode, Role)
```

Write the following query in relational algebra

- (a) Show the name and the city of residence of each dancer who has participated in at least two ballets of the same type organized by two different dance schools and managed by the same artistic director.

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

```
SCOOTER(NumberPlate, Maker, Model, Displacement, RentalDailyAmount)
CUSTOMER(SSN, Name, Surname, DateOfBirth, Nationality)
RENTAL_CONTRACTS_FOR_SCOOTER(NumberPlate, StartDate, EndDate, SSN,
                               PaymentMethod)
```

Write the following query in relational algebra

- (a) For the models of scooters that were *only* rented for periods (difference between **EndTime** and **StartTime**) longer than 20 days, show the number plate, the displacement and the model.

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.