

Introduction to Databases

Homework no. 1: Relational algebra

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

TOUR-GUIDE (GuideCode, Name, Surname, Nationality)
TYPE-OF-TOUR (TourTypeCode, Monument, Duration, City)
GROUP (GroupCode, NumberOfParticipants, Language)
GUIDED-TOUR-CARRIED-OUT (GroupCode, Date, StartTime, TourTypeCode, GuideCode)

Write the following query in relational algebra

- (a) For each Italian tour guide who has *only* guided types of tours lasting more than 2 hours, show name and surname of the guide.
- (b) Show surname and nationality of the guides who have guided *all* types of tours.

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

STUDENT(StudentID, Name, Surname, DegreeCourse)
LABORATORY(LabID, LabName, Capacity)
DEVICE(DeviceID, DeviceName, Type, LabID)
EXPERIMENT(DeviceID, StudentID, Date, Description, Category)

Write the following query in relational algebra

- (a) Show the name of laboratories with a capacity greater than 10 people, where at least 2 experiments were performed on the same day with devices of type 'video camera'.

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

TEENAGER(SSN, Name, Surname, BirthDate, CityOfResidence, Sex)
ACTIVITY(ActivityCode, AName, Description, Category)
SUMMER-CAMP(CampCode, CampName, City)
SUBSCRIPTION-TO-ACTIVITY-IN-SUMMER-CAMP(SSN, ActivityCode, CampCode, SubscriptionDate)

Write the following query in relational algebra

- (a) Show the name and surname of the teenagers who subscribed on the same date (*SubscriptionDate*) to at least two different activities, which are organized by two distinct summer camps located in the same city.