

Assignment 2

Due: see course homepage

This assignment asks you to write queries in SQL. Please test all your queries using your MySQL account. You'll have to create a set of tables for the schemas given in the questions. You should make up data with which to populate your tables so you can adequately test your queries. Remember that even though your queries may give the expected results on your particular relation instances, in order to be completely correct, your queries need to give correct results on any possible relation instance. To populate your tables please use the INSERT statement described in the MySQL tutorial (see Assignment 0). Type your answers (SELECT statements only) in plain text format and submit your assignment via e-mail to the TA with the subject line Assignment 1 submission.

1. Consider the following employee database where the primary keys are underlined:

```
employee(employee name, street, city)
works(employee name, company name, salary)
company(company name, city)
manages(employee name, manager name)
```

Give an expression in SQL for each of the following queries.

- Find the names of all employees who work for First Bank Corporation (1 point).
- Find the names of all employees in the database who live in the same cities as the companies for which they work (2 points).
- Find the names of all employees in the database who live in the same cities and on the same streets as do their managers (2 points).
- Find the names of all employees who earn more than the average salary of all employees of their company (3 points).
- Find the company that has the smallest payroll (i.e. the smallest sum of all employee salaries) (3 points).

2. Consider the following database, where the primary keys are underlined:

```
person(driver id, name, address)
car(car id, model, year)
accident(report number, date, location)
owns(driver id, car id)
participated(driver id, car id, report number, damage amount)
```

Construct SQL queries for this relational database.

- (a) Find the number of accidents in which the cars belonging to John Smith were involved (3 points).
- (b) Find the total damage amount for each car model for all accidents that occurred since Jan 1, 2004. The result table should contain two columns (car model, total damage amount) and be sorted on total damage amount from the highest to the lowest (4 points).

3. Consider the following relational schema:

```
student(student id, student name)
registered(student id, course id)
```

Write an SQL query to list the student-id and name of each student along with the total number of courses that the student is registered for. Students who are not registered for any courses must also be listed, with the number of registered courses shown as 0 (4 points).

4. Consider the following relational schema:

```
employee(emp no, name, office, age)
books(isbn, title, authors, publisher)
loan(emp no, isbn, date)
```

Write the following in SQL.

- (a) Print the numbers and names of all employees who have borrowed any book published by McGraw-Hill (2 points).
- (b) Print the numbers and names of all employees who have borrowed all books published by McGraw-Hill (3 points).
- (c) For each publisher, print the numbers and names of all employees who have borrowed more than ve books of that publisher (3 points).