DDB – Spring 2006

Lab #2

It should take about 3 hours to complete this lab.

You can refer to lab#1 for documentation on how to log in to MySQL. Use the user name you are assigned on the course web page.
NOTE: the drop table command might be useful when you are working on the SQL code. It allows you to drop a relation schema from the database, e.g., *drop table customer;*

Part I

Consider a database that stores university classes in a given domain (e.g., databases).
The database schema is composed of a single table:

```
create table class
(
  id int primary key,
  year year(4),
  institution varchar(40) not null,
  name varchar(80) not null,
  url varchar(300) not null
);
```

Now you want to extend this table to include the topics covered in these classes. You have a list of 10 topics (topic1, …, topic10). Each class is associated to some topics (between 0 and 10).

Modify the schema of the database to incorporate the topics and their association with classes. Don't forget the integrity constraints!

Part II

Consider an hotel that provides online reservation. A customer can reserve a room in the hotel for a given time period. The application relies on a database. You should design the schema for this database and create it in MySQL using the SQL Data Definition Language (see the MySQL documentation on www.mysql.com).

The database schema should represent reservations, customers, rooms and bills.

- Reservations are organized in the following way: it is possible to place a temporary reservation on a room of a given type (single, double, suite) for a given time period (identified by a check-in date and check-out date) by only giving the name of a customer. Such a temporary reservation is only valid one day. In order to confirm a reservation, a customer needs to give her credit card number.
- At check-in time, the customer gives the rest of the information necessary for payment and registration purposes (it should be possible for the hotel manager to track a customer that leaves without paying). The customer is then associated to the room she has reserved (and she is given the key). When a customer shows up at the desk and asks for a room, the reservation and check-in phases are executed consecutively.
- The hotel contains 200 rooms, numbered 1 to 200. 100 rooms are single rooms, 95 rooms are double rooms and there are 5 suites. 80% of each type of room is reserved for non smokers. All rooms have a

standard equipment in terms of bathroom, minibar and entertainment. A room can be free, reserved (when a reservation is placed) or occupied (when a customer has been given this room at check-in time).

- A bill is maintained while the customer is staying at the hotel. Every morning at 5am, the price of the room for the night is added to the customer bill. Expenses (breakfast, minibar, movies, room service) are added to the bill as they are registered.

1. Define a UML or ER model for the hotel application

2. Define an SQL schema for the hotel application using the room and room_type tables from room.sql (available on the class web site), i.e., you should define the SQL commands to create the customer, reservations and bills table.

Note that the table option *engine = InnoDB* is given so that the foreign key constraints can be checked. You should create all your relations with this option.

3. Give the SQL code for modifying the schema of the room relation (with the alter table command) as follows:
   - Include the attributes of room type in the room relation.
   - Drop the foreign key reference to the room_type relation.