Assignment 1: SQL Queries

Due on October 6, 2010, at the beginning of class

Each question is worth 10 points, for a total of 150 (15% of the course grade). This assignment should be done *individually*. You can *discuss* the problems with your fellow students. If you do so, please specify on your assignment with whom you discussed it. (E.g., "Discussed with Obiwan Kenobi and Darth Vader.") Discussing problems, however, should not be interpreted as doing them together. The final query, results and explanations must be your own. Please see the section called "Academic Integrity" in the course syllabus.

The following requirements apply to all questions except 7 and 15. (Questions 8, 9 and 10 would not include the results of the query, though.)

1. Include the SQL query

Your answer should include the exact SQL query that you used to answer the question. Each question should be answered using just **one** query. For full credit, your query should be designed so that it would produce a table that contains **only the information needed to answer the question** and nothing else. For example, if you are asked to find out who owns the youngest pet, your query should produce a table with just one cell (not counting the header row) showing the name of the person who owns the youngest pet. It should **not** show the name of the pet or its age. Even more importantly, it should **not** show information about any other pets. On the other hand, if you are asked who are the *names* and *owners* of the *two* youngest pets, then your query should produce a table with *two* rows, one for the youngest pet and one for the second youngest pet, with both rows showing the name of the pet and the name the pet's owners.

If you cannot produce a table showing just the required information, you should turn in a query that produces the most concise table that you can get, for partial credit.

2. Explain the query

Your answer should include a brief (30-100 words) explanation, in your own words, of what your query does. See the example below.

3. Include the result of the query

Your answer should include the exact table returned by MySQL (copy and paste it).

4. Include the answer

Make sure to actually answer the question asked, in your own words.

For example, if you are asked: "Animals of which species have a total weight of less then 200 grams?" Your answer may look like this:

```
select species from pet group by species having sum(weight)<0.2;
```

I am asking MySQL to group the rows by species, giving me a results table with one column — the names of the species, including in this table only those species for which the sum of weights of all pets is less than 0.2.

```
+---------+
| species |
+---------+
| bird    |
| hamster |
+---------+
2 rows in set (0.00 sec)
```

The two species with a total weight of less than 200 grams are birds and hamsters.

Menagerie

Answer questions 1-7 using the "menagerie" database on the database server.

Question 1

Which male dogs weigh 20 kg or less? (Assume that the values in the "weight" column are in kg.)

Question 2

Which of Gwen's pets were born after 1995 but not in 1998?

Question 3

Who owns the heaviest dog? (Use "order by" and "limit.")

Question 4

What is the total weight of dogs owned by Harold? (Use "sum.")

Question 5

Who are the two pet owners with the maximum weight for their *lightest* pet? In other words, for each pet owner, we are only interested in their *smallest* pet (by weight), and we want to know whose smallest pet is the heaviest, and whose smallest pet is second heaviest. (Use "group by," "order by," and "limit.")

Question 6

What species has the smallest average weight for pets whose sex is either male or unknown? (If you cannot compute the average by species, for partial credit find the species of the lightest pet whose sex is either male or unknown.)

Question 7

Explain the difference between the following two statements:

```
select species, sum(weight) from pet
group by species having sum(weight)<1;
```

and

```
select species, sum(weight) from pet
where sum(weight)<1 group by species;
```

If one of those statements is incorrect, explain why.

Monkeys

For questions 8, 9 and 10, suppose we have a database table called "monkeys," which has five fields:

Name	Type	Comment
monkey_id	`integer`	an integer ID unique to each monkey
name	`varchar(20)`	monkey's name
bananas_eaten	`float`	the total number of bananas the monkey has eaten
cell	`varchar(20)`	monkey's cell phone number or NULL if the monkey does not have a cell phone
mood	`char(1)`	"H" if the monkey is happy, "S" if it is sad, NULL if the mood is unknown

Since you are not being given the actual database in this case, you just need to provide the SQL query and explain what it does.

Question 8

Construct a query showing monkey_ids of the top ten happy monkeys by the number of bananas eaten, excluding monkeys that do not have cell phones.

Question 9

Construct a query showing how many monkeys are happy, from among monkeys whose names end with the letter "y."

Question 10

Construct a query that would show you the average numbers of bananas eaten by happy and by sad monkeys. The resulting table should look like this:

```
+-------+--------------------+
| mood  | avg(bananas_eaten) |
+-------+--------------------+
| H     |        24.923      |
| S     |        17.203      |
+-------+--------------------+
```

Make sure that the query does *not* include any results for monkeys whose mood is unknown.

Diveshop

For questions 11-15 use the "diveshop" database on the database server. Use "join... on..." syntax.

Question 11

What are the names for the customers who ordered vacations costing over $20,000. (Join DIVECUST and DIVEORDS tables. Do **not** add up the cost of different vacations by the same customer.)

Question 12

What are the two most visited destinations? (If a customer booked multiple trips to the same destination, count all of them separately.)

Question 13

What is the most popular payment method for customers living **outside** California ("CA")?

Question 14

What is the winter temperature in C° at the place where the customer from Michigan ("MI") booked his vacation? (You will need to join DIVECUST, DIVEORDS and DEST tables.)

Question 15

What is the question that the following query aims to answer and how is it doing it?

Query 1:

```
select Destination_Name
from BIOLIFE
join BIOSITE on BIOLIFE.Species_No=BIOSITE.Species_No
join SITES on BIOSITE.Site_No=SITES.Site_No
join DEST on SITES.Destination_No=DEST.Destination_No
where Common_Name="Blue Angelfish"
and Skill_Level="Beginning"
and Travel_Cost < 5000;
```

How is query 1 different from the queries 2 and 3 below:

Query 2:

```
select Destination_Name
from BIOLIFE
natural join BIOSITE
natural join SITES
natural join DEST
where Common_Name="Blue Angelfish"
and Skill_Level="Beginning"
and Travel_Cost < 5000;
```

Query 3:

```
select Destination_Name
from BIOLIFE
join BIOSITE
join SITES
join DEST
where Common_Name="Blue Angelfish"
and Skill_Level="Beginning"
and Travel_Cost < 5000;
```