

CS 386/586 Winter 2012  
Assignment 1

Assigned: Tuesday, January 10, 2012

Due: Tuesday, January 17, 2012 at 4:40PM

(This assignment was updated on Friday, January 13, 2012 at 11:05AM – shown in red below in 3d.)

You must have permission from the instructor, based on a health, family, or work-related emergency, to be able to turn in an assignment late.

Turn your papers in, on paper, in class. (If you are taking the class remotely, then you can send a single pdf file as an attachment to an e-mail to the instructor at [lmd@cs.pdx.edu](mailto:lmd@cs.pdx.edu). If you attend class, please turn it in on paper.)

This assignment can be done individually or in a team of two students. If you work as a team, turn in one paper with both students' names on the paper.

Note: Do NOT ask questions about queries against the Spy database when you post questions on piazza. Rather, write a similar query against the sailors database that allows you to ask your question. Or ask your question in a generic way – that doesn't mention any particular database.

1. (44 points) Use the `introdb_spy` database available from the PostgreSQL query page as well as the description of this database available from the Database Support Page and the text file of commands that you can use to create the Spy database. These are all reachable from the class web page at <http://www.cs.pdx.edu/~lmd/cs386>. Click on "link to DB information" at the top of the page; click on "PostgreSQL Query Page" or "Database Support Page".

Draw a diagram of the schema for the Spy database using the format shown on slide 30 of Lecture 1. Each table must be represented by a box with the table name in the top row followed by the list of attributes for the table shown in the remaining rows of the box. The table key must be indicated by underlining the appropriate attributes. All foreign keys must be indicated by an arrow (in the case of a foreign key that consists of just one attribute) from the attribute that is the foreign key pointing directly to the attribute that it references. (It is NOT sufficient to simply point to the box surrounding

the table; you must point directly to the attribute that is being referenced.) Hint: for the Spy database, the foreign keys always have the same name as the attribute that they reference. Hint: the foreign keys present in the tables whose names end with "Rel" are not listed in the description of the Spy database; you MUST include the foreign keys contained in these tables whose names end with Rel. Hint: if you're not sure, look at the text file of commands that you can use to create the Spy database.

You can draw your diagram by hand or by using MS Word or MS PowerPoint or other tool.

2. (28 points) (Single table queries) Write and execute a query that finds the following answers.

For each question, include the query that you executed, copy the first five rows of your query answer (or copy the entire query answer if your answer has fewer than 5 rows), and indicate the total number of rows returned.

- a. List the agent\_id, first, middle, and last name, and salary for agents that have a salary < 53000.
  - b. List the agent\_id, first, middle, and last name, and security clearance id for agents that have a security clearance id > 5.
  - c. List the agent\_id, first, middle, and last name, city, country, and security clearance id for agents that live in Paris, France.
  - d. List the agent\_id, first, middle, and last name, security clearance id, and city for agents who live in Paris (regardless of country) and who have a security clearance id > 5.
  - e. List the agent\_id, first and last names for agents who have no middle name. (Hint: to test whether an attribute has no value put this in the WHERE clause: WHERE middle is null. You can also say, for example, WHERE middle is not null – in a different query – to find agents who have a middle name.)
  - f. List the mission\_id, mission name, and mission status for all missions where the status is not 'success'.
  - g. List all attributes in the team table for teams where the teams meet weekly.
3. (28 points) (Queries that use Joins) Write and execute a query that finds the following answers.
- For each question, include the query that you executed, copy the first five rows of your query answer (or copy the entire query answer if your answer has fewer than 5 rows),

and indicate the total number of rows returned.

- a. List the agent\_id, first, middle, and last name, security clearance id, and security clearance description for agents that have a security clearance id > 5. (Note the difference between this query and query 2b above. For this one, you must join the agent table with the securityclearance table.)
  - b. List the mission id, team name, and mission status for all missions that have a status of 'failed'. (You must join the mission table with the team table.)
  - c. List the agent\_id, first, middle, and last name, skill id and skill name that shows exactly the skills that the agent has. (You must join the agent table to the skill\_rel table and you must join the skill\_rel table to the skill table.)  
Describe the queries that you issued to convince yourself that you have the right answer for this query. Describe your rationale for using those queries and how you decided that your query answer was correct.
  - d. List the agent\_id, first, middle, and last name, language id, and language name for all agents that have a security clearance id > 5. You must list the languages that show exactly the languages spoken by the agent.
  - e. List the team name and first, middle, and last name for the agent. This query must show the team name for agents that are on that team.
4. (5 points) Bonus question: For query 3a and for query 3d, write each query two additional ways (beyond the way you wrote the query above). The three ways should be: (a) using a JOIN clause with the ON clause in the FROM, (b) using a JOIN clause with the USING clause in the FROM, and (c) using NO join clause in the FROM clause.