Section 2

1: SQL Practice

Schema

CREATE TABLE Population ( 
    rank INTEGER, 
    country VARCHAR(30) PRIMARY KEY, 
    population DOUBLE, 
    percentage FLOAT 
);

CREATE TABLE GDP ( 
    rank INTEGER, 
    country VARCHAR(30) PRIMARY KEY, 
    gdp DOUBLE 
);

CREATE TABLE Airport ( 
    code VARCHAR(30) PRIMARY KEY, 
    name VARCHAR(30), 
    country VARCHAR(30) 
);
Problems

— What is the total population of earth?
Total_Population
6778067375

— What is the percentage of the population from the top 10 populated countries?
Top_Sum
58.9241749607129

— How many countries do have less than 1,000,000 population?
Small_Countries
68

— How many countries have airports?
Airport_Count
247

— Top 10 countries with most airports, in descending order
country        Count
-------------  ----------
United States  2238
Australia      617
Canada         533
Papua New Gui  380
Brazil         288
Indonesia      205
China          187
Colombia       167
United Kingdo  151
France         144

— Order the top 10 countries by total GDP per capita (gdp / population)
country     GDP_per_capita
----------  -----------------
Seychelles  0.282666666666667
Saint Kitt  0.256076923076923
Antigua an  0.196681818181818
Luxembourg  0.158883485309017
Dominica    0.152507462686567
Brunei      0.119825
Iceland     0.118570005575638
Grenada     0.102855769230769
Saint Vinc  0.092908256880733
Barbados    0.087
2. Join & Aggregation

Schema

CREATE TABLE Class ( dept VARCHAR(6),
number INTEGER,
title VARCHAR(75),
PRIMARY KEY (dept, number)
);

CREATE TABLE Instructor ( username VARCHAR(8),
fname VARCHAR(50), lname VARCHAR(50), started_on CHAR(10), PRIMARY KEY (username)
);

CREATE TABLE Teaches ( username VARCHAR(8),
dept VARCHAR(6),
number INTEGER,
PRIMARY KEY (username, dept, number),
FOREIGN KEY (username) REFERENCES Instructor(username), FOREIGN KEY (dept, number) REFERENCES Class(dept, number)
);
Problems

/* Review of joins */

-- Who teaches CSE 451?
fname       lname
----------  ----------
Tom         Anderson
John        Zahorjan
Hank        Levy

-- What courses does Zahorjan teach?
depth       number
----------  ----------
CSE         378
CSE         451
CSE         461

-- Which courses do both Levy and Zahorjan teach?
depth       number      title
----------  ----------  ---------------------------------
CSE         451         Introduction to Operating Systems

/* Queries using aggregation functions */

-- How many classes are there in the course catalog?
COUNT(*)
----------
3

-- What are the highest and lowest class numbers?
MIN(number)  MAX(number)
----------  ----------
378          461
/* Queries with both grouping and aggregation */

-- How many instructors teach each class?

<table>
<thead>
<tr>
<th>dept</th>
<th>number</th>
<th>teacher_count</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE</td>
<td>378</td>
<td>1</td>
</tr>
<tr>
<td>CSE</td>
<td>451</td>
<td>3</td>
</tr>
<tr>
<td>CSE</td>
<td>461</td>
<td>3</td>
</tr>
</tbody>
</table>

-- Order the instructors by who teaches in the most departments

<table>
<thead>
<tr>
<th>username</th>
<th>Department_Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>djw</td>
<td>1</td>
</tr>
<tr>
<td>levy</td>
<td>1</td>
</tr>
<tr>
<td>tom</td>
<td>1</td>
</tr>
<tr>
<td>zahorjan</td>
<td>1</td>
</tr>
</tbody>
</table>