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CPSC 321 01

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Homework 4

1. Find the countries with low inflation and a high GDP.

```
+--------------+--------------------------+----------------+-----------+
| country_code | country_name             | gdp_per_capita | inflation |
+--------------+--------------------------+----------------+-----------+
| US           | United States of America |          72749 |       3.7 |
| NL           | Netherlands              |          53000 |       4.9 |
+--------------+--------------------------+----------------+-----------+
2 rows in set (0.088 sec)
```

2. Find all provinces that have a small total area that are in a country with high inflation.

```
+--------------+--------------+-----------+-------------------+------+
| country_code | country_name | inflation | province_name     | area |
+--------------+--------------+-----------+-------------------+------+
| MX           | Mexico       |       6.1 | Mexico City       | 1485 |
| NL           | Netherlands  |       4.9 | North Brabant     | 5079 |
| NL           | Netherlands  |       4.9 | Gelderland        | 5132 |
| VN           | Vietnam      |       4.9 | Ba Ria-Vung Tau   | 1989 |
| VN           | Vietnam      |       4.9 | Hanoi             | 2168 |
| VN           | Vietnam      |       4.9 | Ho Chi Minh City  | 4715 |
| VN           | Vietnam      |       4.9 | Khanh Hoa         | 5207 |
+--------------+--------------+-----------+-------------------+------+
7 rows in set (0.004 sec)
```

3. Rewrite (2) using JOIN.

```
+--------------+--------------+-----------+-------------------+------+
| country_code | country_name | inflation | province_name     | area |
+--------------+--------------+-----------+-------------------+------+
| MX           | Mexico       |       6.1 | Mexico City       | 1485 |
| NL           | Netherlands  |       4.9 | North Brabant     | 5079 |
| NL           | Netherlands  |       4.9 | Gelderland        | 5132 |
| VN           | Vietnam      |       4.9 | Ba Ria-Vung Tau   | 1989 |
| VN           | Vietnam      |       4.9 | Hanoi             | 2168 |
| VN           | Vietnam      |       4.9 | Ho Chi Minh City  | 4715 |
| VN           | Vietnam      |       4.9 | Khanh Hoa         | 5207 |
+--------------+--------------+-----------+-------------------+------+
7 rows in set (0.003 sec)
```

4. Find the unique set of all provinces that have at least one city with a population greater than a specific value.

```
+--------------+---------------------------+-------------------+--------+
| country_code | country_name              | province_name     | area   |
+--------------+---------------------------+-------------------+--------+
| CA           | Canada                    | Alberta           | 661848 |
| DE           | Germany                   | Bavaria           |  70550 |
| CN           | China                     | Beijing           |  16808 |
| US           | United States of America  | California        | 163696 |
| CN           | China                     | Guangdong         | 179800 |
| FR           | France                    | Île-de-France     |  12011 |
| DE           | Germany                   | Nordrhein-Westfalen|  34085 |
| CA           | Canada                    | Ontario           | 415598 |
| CA           | Canada                    | Quebec            | 514255 |
| CN           | China                     | Shanghai          |   6341 |
| US           | United States of America  | Texas             | 695662 |
| CN           | China                     | Zhejiang          | 101800 |
+--------------+---------------------------+-------------------+--------+
12 rows in set (0.004 sec)
```

5. Rewrite (4) using JOIN.

```
+--------------+---------------------------+-------------------+--------+
| country_code | country_name              | province_name     | area   |
+--------------+---------------------------+-------------------+--------+
| CA           | Canada                    | Alberta           | 661848 |
| CA           | Canada                    | Ontario           | 415598 |
| CA           | Canada                    | Quebec            | 514255 |
| CN           | China                     | Beijing           |  16808 |
| CN           | China                     | Guangdong         | 179800 |
| CN           | China                     | Shanghai          |   6341 |
| CN           | China                     | Zhejiang          | 101800 |
| DE           | Germany                   | Bavaria           |  70550 |
| DE           | Germany                   | Nordrhein-Westfalen|  34085 |
| FR           | France                    | Île-de-France     |  12011 |
| US           | United States of America  | California        | 163696 |
| US           | United States of America  | Texas             | 695662 |
+--------------+---------------------------+-------------------+--------+
12 rows in set (0.007 sec)
```

6. Find the unique set of all provinces with at least two cities having a population greater than a specific value.

```
+--------------+--------------------------+---------------+--------+
| country_code | country_name             | province_name | area   |
+--------------+--------------------------+---------------+--------+
| CN           | China                    | Beijing       |  16808 |
| US           | United States of America | Texas         | 695662 |
| CN           | China                    | Guangdong     | 179800 |
| CN           | China                    | Zhejiang      | 101800 |
| US           | United States of America | California     | 163696 |
| CN           | China                    | Shanghai      |   6341 |
+--------------+--------------------------+---------------+--------+
6 rows in set (0.003 sec)
```

7. Rewrite (6) using JOIN.

```
+--------------+--------------------------+---------------+--------+
| country_code | country_name             | province_name | area   |
+--------------+--------------------------+---------------+--------+
| CN           | China                    | Beijing       |  16808 |
| US           | United States of America | Texas         | 695662 |
| CN           | China                    | Guangdong     | 179800 |
| CN           | China                    | Zhejiang      | 101800 |
| US           | United States of America | California     | 163696 |
| CN           | China                    | Shanghai      |   6341 |
+--------------+--------------------------+---------------+--------+
6 rows in set (0.005 sec)
```

8. Find pairs of different cities with the same population.

```
+-----------+----------------+---------+-----------+--------------+---------+------------+
| city_name | province_name  | country | city_name | province_name| country | population |
+-----------+----------------+---------+-----------+--------------+---------+------------+
| Baoding   | Beijing        | CN      | Dongguan  | Guangdong    | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Foshan    | Guangdong    | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Hangzhou  | Zhejiang     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Jiaxing   | Zhejiang     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Nantong   | Shanghai     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Shenzhen  | Guangdong    | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Suzhou    | Shanghai     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Baoding   | Beijing        | CN      | Wuxi      | Shanghai     | CN      |    1100000 |
| Baoding   | Shanghai       | CN      | Hangzhou  | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | CN      | Jiaxing   | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | CN      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | XX      | Hangzhou  | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | XX      | Jiaxing   | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | XX      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Baoding   | Shanghai       | XX      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Hangzhou  | Zhejiang     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Jiaxing   | Zhejiang     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Nantong   | Shanghai     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Suzhou    | Shanghai     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Dongguan  | Guangdong      | CN      | Wuxi      | Shanghai     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Hangzhou  | Zhejiang     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Jiaxing   | Zhejiang     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Nantong   | Shanghai     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Suzhou    | Shanghai     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Foshan    | Guangdong      | CN      | Wuxi      | Shanghai     | CN      |    1100000 |
| Long Dien | Ba Ria-Vung Tau| VN      | Van Ninh  | Khanh Hoa    | VN      |     100000 |
| Nantong   | Shanghai       | CN      | Ningbo    | Zhejiang     | CN      |    1100000 |
| Nantong   | Shanghai       | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Phuoc Hai | Ba Ria-Vung Tau| VN      | Van Ninh  | Khanh Hoa    | VN      |     100000 |
| Shenzhen  | Guangdong      | CN      | Suzhou    | Shanghai     | CN      |    1100000 |
| Shenzhen  | Guangdong      | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
| Shenzhen  | Guangdong      | CN      | Wuxi      | Shanghai     | CN      |    1100000 |
| Suzhou    | Shanghai       | CN      | Wenzhou   | Zhejiang     | CN      |    1100000 |
+-----------+----------------+---------+-----------+--------------+---------+------------+
40 rows in set (0.006 sec)
```

9. Find all countries with a high GDP and low inflation that border a country with a low
   GDP and high inflation.

```
+--------------+--------------------------+
| country_code | country_name             |
+--------------+--------------------------+
| US           | United States of America |
+--------------+--------------------------+
1 row in set (0.003 sec)
```

10. Rewrite (9) using JOIN.

```
+--------------+--------------------------+
| country_code | country_name             |
+--------------+--------------------------+
| US           | United States of America |
+--------------+--------------------------+
1 row in set (0.004 sec)
```

11. Find pairs of neighboring countries that share a border and have a significant difference in GDP per capita. Specifically, retrieve pairs of countries with a border length greater than 300 kilometers and where the difference in GDP per capita between the countries is greater than $5,000.

```
+--------------+--------------------------+--------------+--------------+
| country_code | country_name             | country_code | country_name |
+--------------+--------------------------+--------------+--------------+
| DE           | Germany                  | NL           | Netherlands  |
| FR           | France                   | NL           | Netherlands  |
| US           | United States of America | CA           | Canada       |
| US           | United States of America | MX           | Mexico       |
| VN           | Vietnam                  | CN           | China        |
| VN           | Vietnam                  | XX           | TestCountry  |
+--------------+--------------------------+--------------+--------------+
6 rows in set (0.004 sec)
```

12. Issues and Challenges

   - I don't have any significant issues completing this assignment.

   - Something I find challenging most is to think of cases where DISTINCT would be necessary or not, as there is not "rule of thumb" for this.