

Databases - Lab Sheet 1

Gordon Royle

School of Mathematics & Statistics
University of Western Australia

Solutions

Each slide shows

- A question from the lab sheet
- A SQL query
- The output from that query
- The solution derived from that query

Usually there will be many other ways to do this.

Q1

How many rows in the City table?

```
SELECT *  
FROM City;
```

```
+-----+-----+-----+-----+  
| ID    | Name                | CountryCode | Population |  
+-----+-----+-----+-----+  
| 1     | Kabul               | AFG         | 1780000   |  
| 2     | Qandahar            | AFG         | 237500    |  
| 3     | Herat               | AFG         | 186800    |  
| 4     | Mazar-e-Sharif     | AFG         | 127800    |  
...  
| 4077  | Jabaliya            | PSE         | 113901    |  
| 4078  | Nablus              | PSE         | 100231    |  
| 4079  | Rafah               | PSE         | 92020     |  
+-----+-----+-----+-----+  
4079 rows in set (0.00 sec)
```

Expected answer: 4079

Q2

QUESTION: How many attributes does a city have?

```
mysql> DESCRIBE City;
```

Field	Type	Null	Key	Default	Extra
ID	int(11)	NO	PRI	NULL	auto_increment
Name	char(35)	NO			
CountryCode	char(3)	NO			
Population	int(11)	NO		0	

```
4 rows in set (0.01 sec)
```

ANSWER: 4

Q3

QUESTION: How many tables are in the `world` database?

```
mysql> SHOW TABLES;
+-----+
| Tables_in_world |
+-----+
| City             |
| Country          |
| CountryLanguage |
+-----+
3 rows in set (0.00 sec)
```

ANSWER: 3

Q4

QUESTION: How many cities have a population between 500000 and 1000000 (inclusive)?

```
SELECT * FROM City
WHERE population >= 500000
AND Population <= 1000000;
```

```
+-----+-----+-----+-----+
| ID    | Name                | CountryCode | Population |
+-----+-----+-----+-----+
| 5     | Amsterdam           | NLD         | 731200    |
| 6     | Rotterdam           | NLD         | 593321    |
...
| 3821  | Oklahoma City       | USA         | 506132    |
| 4069  | Bulawayo            | ZWE         | 621742    |
+-----+-----+-----+-----+
303 rows in set (0.00 sec)
```

ANSWER: 303

Q5

QUESTION: What is the name of the most populous city in the table?

```
SELECT *  
FROM City  
ORDER BY Population DESC  
LIMIT 5;
```

```
+-----+-----+-----+-----+  
| ID    | Name                | CountryCode | Population |  
+-----+-----+-----+-----+  
| 1024  | Mumbai (Bombay)    | IND         | 10500000  |  
| 2331  | Seoul              | KOR         | 9981619   |  
| 206   | São Paulo          | BRA         | 9968485   |  
| 1890  | Shanghai           | CHN         | 9696300   |  
| 939   | Jakarta            | IDN         | 9604900   |  
+-----+-----+-----+-----+  
5 rows in set (0.00 sec)
```

ANSWER: Mumbai (Bombay)

Q6

QUESTION: How many different country codes are used in the table?

```
SELECT DISTINCT CountryCode
```

```
FROM City;
```

```
+-----+
```

```
| CountryCode |
```

```
+-----+
```

```
| AFG          |
```

```
| NLD          |
```

```
...
```

```
| ZWE          |
```

```
| PSE          |
```

```
+-----+
```

```
232 rows in set (0.00 sec)
```

ANSWER: 232

(There are 239 distinct country codes in the table `Country`)

Q7

QUESTION: What is the country code that is earliest in the alphabet?

```
SELECT CountryCode
FROM CITY
ORDER BY CountryCode ASC
LIMIT 1;
```

```
+-----+
| CountryCode |
+-----+
| ABW         |
+-----+
1 row in set (0.00 sec)
```

ANSWER: ABW

Q8

QUESTION: What is the country code that is latest in the alphabet?

```
SELECT CountryCode
FROM CITY
ORDER BY CountryCode DESC
LIMIT 1;
```

```
+-----+
| CountryCode |
+-----+
| ZWE          |
+-----+
1 row in set (0.00 sec)
```

ANSWER: ZWE

Q9

QUESTION:

```
mysql> SELECT Name, Code FROM Country ORDER BY Code LIMIT 1;
+-----+-----+
| Name   | Code  |
+-----+-----+
| Aruba  | ABW   |
+-----+-----+
1 row in set (0.00 sec)
```

ANSWER: Aruba

Q10

QUESTION: What is the country code for the country containing the English city London?

```
SELECT CountryCode
FROM City
WHERE Name='London';
+-----+
| CountryCode |
+-----+
| GBR          |
| CAN          |
+-----+
2 rows in set (0.00 sec)
```

ANSWER: GBR (need to check separately which of CAN/GBR is English)

Q11

QUESTION: What is the largest city in the country that contains the *other* city called London?

```
SELECT Name
FROM City
WHERE CountryCode = 'CAN'
ORDER BY Population DESC;
LIMIT 1;
```

```
+-----+
| Name      |
+-----+
| Montréal  |
+-----+
1 row in set (0.00 sec)
```

ANSWER: Montreal

Q12

QUESTION: What is the average city population for the cities in Germany?

```
SELECT AVG(Population)
FROM City
WHERE CountryCode = 'DEU';
+-----+
| AVG(Population) |
+-----+
|      282209.4946 |
+-----+
1 row in set (0.00 sec)
```

ANSWER: 282209.4946

(Some implementations of MySQL give a different number of decimal places)

Q13

QUESTION:What is the standard deviation of the populations of the German cities?

```
SELECT STD(Population)
FROM City
WHERE CountryCode = 'DEU';
+-----+
| STD(Population) |
+-----+
| 404424.12644059607 |
+-----+
1 row in set (0.00 sec)
```

ANSWER: 404424.12644059607

Q14

QUESTION: How many Chinese cities have populations of strictly more than 1000000?

```
SELECT *  
FROM City  
WHERE Countrycode = 'CHN'  
AND Population > 1000000
```

```
+-----+-----+-----+-----+  
| ID    | Name                | CountryCode | Population |  
+-----+-----+-----+-----+  
| 1890  | Shanghai            | CHN         | 9696300   |  
| 1891  | Peking              | CHN         | 7472000   |  
...  
| 1923  | Jilin               | CHN         | 1040000   |  
| 1924  | Tangshan            | CHN         | 1040000   |  
+-----+-----+-----+-----+
```

35 rows in set (0.00 sec)

ANSWER: 35

Q15

QUESTION: What is the total population of all the listed Chinese cities?

```
SELECT Sum(Population)
FROM    City
WHERE   Countrycode = 'CHN';
```

```
+-----+
| SUM(Population) |
+-----+
|          175953614 |
+-----+
1 row in set (0.00 sec)
```

ANSWER: 175953614