

Report on Lab Work 2

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1 Pair of SQL Queries

1.1 Join VS Cross Join

A. select o.name as Organization, o.established,
c.name as country, c.capital as capital, cit.name as
city, cit.population
from country as c, organization as o, ismember as
m, city as cit
where c.code = o.country
and o.country = m.country
and o.abbreviation = m.organization
and cit.name = o.city;

(10) Return the length of all rivers in Great Britain.

```
\project_{rname, length} \select_{country='GB'}  
(\rename_{rname, length} \project_{name, length} river  
  \join  
  \rename_{rname, country} \project_{river, country} geo_
```

(11) Return the name of the countries that have the 10 longest total length of rivers.

2 Task 2: Relational-algebraic expression

(6) Return countries that are not landlocked (i.e., have a sea coast).

```
\project_{name} (\project_{name, code} country \join_{country=code} (geo_river \join_{country=code} geo_sea), country))
```

(7) Return the names of all lakes, rivers and seas.

```
\rename_{L_R_S_names} (\project_{name} lake)
```

```
\union (\project_{name} river) \union (\project_{name} sea);
```

(8) Return the average length of a river.

```
\project_{avg(length)} river;
```

(9) Return the name of countries that have more than 10 islands.

```
\pi_{name, num_island} (\sigma_{code=country \wedge num_island>10  
(country \gamma_{count(island) \rightarrow num_island} (geo_island) \bowtie country))
```

Question (6),(7),(8), and (10) were executed via the RA software, and their output were printed in file: "Lei_Liu_LW1_RA_Result.txt".

3 Task 3: SQL expression

(12) Return the names of up to 10 countries and the value corresponding to half the country's population.

```
select name, (population/2) as half_of_population from co
```

(13) Return all the information available about cities whose name is Manchester.

```
select * from city where name = 'Manchester';
```

(14) Return the name of cities whose name starts with the substring 'Man'.

```
select name from city where name like 'Man%';
```

(15)Return the name of both countries with Buddhist populations and organizations, established after 1st December 1994, that the country is a member of.

```
select c.name as country, organization from country c join  
(select distinct m.country as country_code, o.name as organization  
from organization o join ismember m on m.organization = o.abbreviation  
where o.established > '1994-12-01' and m.country in  
( select country from religion where name = ' Buddhist'))mem  
onc.code = mem.country_code;
```

(16)Return the name of each country with the number of islands in it.

```
select c.name, count(geo.island) as num_island from country c  
join geo_island geo on c.code = geo.country group by geo.island;
```

Executed result were logged in file:

Lei_Liu_LW1_SQL.log

Also, the sql script file is: *Lei_Liu_LW1_SQL.sql*