Introduction to databases

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Connection to the database through the phpMyAdmin web interface :

— From a browser open the URI http ://kr.unige.ch/phpmyadmin or http ://129.194.69.202/phpmyadmin/

  — Username : etu

  — Password : x

— Once connected, select the Enviro database from the list on the left.

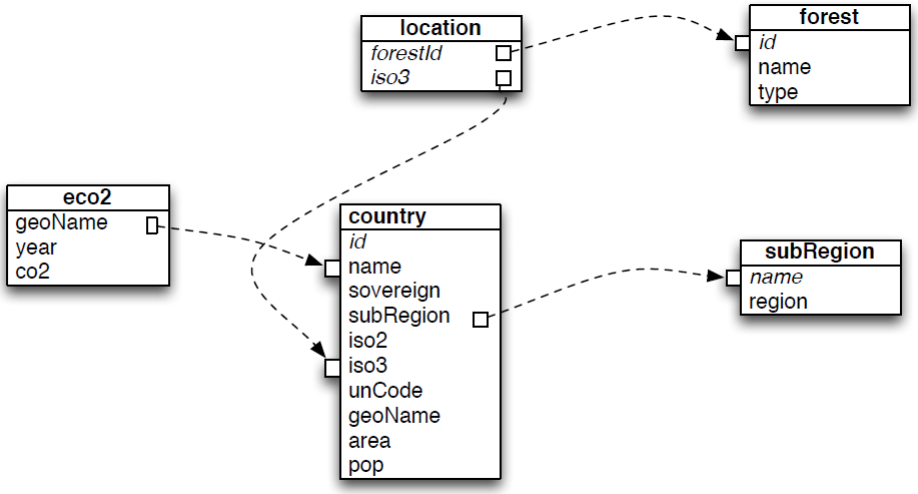
— Click the SQL tab to enter a SQL query or open a query window by clicking the "Query window" icon (in the middle above the list of bases).

— To execute the request click (GO) / (Execute).

— You can modify a query already executed by clicking [Edit] below right of the query

Questions

Write the SQL queries needed to complete the tasks below. The schema of the database is the following :



Selection operations

1. List information for countries with IDs less than 100

```
select *
from country
where id < 100
```

2. List countries that are not sovereign, i.e. those whose geographical name (geoName) is different from that of their sovereign.
3. List the CO_2 emission values of countries for the year 1990.
4. List information corresponding to 'Mangroves' type forests.
5. List countries whose geoName contains the word Republic.

```
select name
from country
where geoName<>sovereign
```

```
select co2, geoName
from eco2
where year = 1990
```

```
select *
from forest
where type = "Mangroves"
```

```
select *
from country
where  geoName like "%Republic%"
```

Projection operations (and calculation)

1. List all regions.
2. What are the iso3 codes of countries with forests?
3. Display country names and population density.

```
select distinct region
from subRegion
```

```
select distinct country.iso3
from country, forest
```

```
select name, pop/area as density
from country
```

Selection + projection operations

1. Which subregions make up the 'Asia + Pacific' region?
2. In which region does the 'Arctic' subregion belong?

```
select name
from subRegion
where region = "Asia + Pacific"
```

```
select region
from subRegion
where name = "Arctic"
```

Join operations

1. What are the names (name) and geoName of countries in the *West Asia* region?
2. Find Country Names that own Mangroves Forests.
3. Find all forest types of the country whose geoName is *Australia.*
4. Display for each country the number of tonnes of CO_2 emitted per capita for the year 2007.

```
select country.name, country.geoName
from country, subRegion
where country.subRegion = subRegion.name
and subRegion.region = "West Asia"
```

```
select country.name
from country, forest, location
where location.iso3 = country.iso3
and location.forestId = forest.id
and forest.type = "Mangroves"
```

```
select country.name
from country, forest, location
where location.iso3 = country.iso3
and location.forestId = forest.id
and forest.type = "Mangroves"
```

```
select country.geoname, 1000*co2/pop
from country, eco2
where eco2.geoName = country.geoName
and year = 2007
```

Self joins

1. For each country calculate the difference between CO_2 emissions in 1989 and 2007.
2. Same question but we want the results in ascending order of difference.

```
SELECT e1.geoName, e1.co2-e2.co2
FROM eco2 e1, eco2 e2
WHERE e1.geoName=e2.geoName and e1.year=1989 and
e2.year=2007
```

```
SELECT e1.geoName, e1.co2-e2.co2 as diff
FROM eco2 e1, eco2 e2
WHERE e1.geoName=e2.geoName and e1.year=1989
and e2.year=2007 order by diff
```

Aggregation operations

1. Calculate the number of subregions in the 'Asia + Pacific' region.
2. Calculate the average value of CO_2 emissions in Brazil for the years listed in the database.
3. Find the average, minimum and maximum CO_2 emissions per capita in 2007.

```
SELECT count(name)
FROM subRegion
WHERE region = "Asia + Pacific"
```

```
SELECT avg(co2)
FROM eco2
WHERE geoName = "Brazil"
```

```
SELECT avg(co2/pop)as AVG, min(co2/pop) as MIN ,max(co2/pop) as MAX
FROM eco2, country
WHERE eco2.geoName=country.name and eco2.year = 2007
```

Queries with grouping

1. List each year the cumulative CO_2 emission values of all countries.
2. List cumulative CO_2 emission values by country for the years 2000 to 2007.

```
SELECT year,sum(co2)
FROM eco2
group by year
```

```
SELECT geoName,sum(co2)
FROM eco2
where year between 2000 and 2007
group by geoName
```

Nested queries

1. List the countries (with year and CO_2 emission value) exceeding the average CO_2 emission value.
2. List the countries (with year and CO_2 emission value / inhabitant) exceeding the average CO_2 emission per capita.

```
SELECT geoName,year, co2
FROM eco2
where co2 > (select avg(co2) from eco2)
```

```
SELECT eco2.geoName,eco2.year, eco2.co2/country.pop
FROM eco2, country
where eco2.geoName = country.name and eco2.co2/country.pop > (select avg(eco2.co2/country.pop) from eco2,country where eco2.geoName = country.name)
```