Praktikum zur Vorlesung Datenbanken
Handreichung

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<table>
<thead>
<tr>
<th>Datum</th>
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<tbody>
<tr>
<td>Team (Account)</td>
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<tr>
<td>Passwort</td>
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</tbody>
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Aktuelle Informationen, Ansprechpartner, Materialien und Uploads unter:
http://www.is.inf.uni-due.de/courses/db_ws16/
1 Beschreibung der Geodatenbank

Für die SQL-Aufgaben ist eine Beispieldatenbank mit geographischen Daten vorgegeben. Diese Datenbank *mondial* solltet Ihr in der ersten Woche unter einem lokalen Alias katalogisiert haben.

Der relevante Ausschnitt des Schemas der Datenbank ist im Anschluss beschrieben. Ihr könnt den Aufbau der Tabellen auch direkt von der Datenbank erfragen. Die Daten der Tabellen geben teilweise kein vollständiges Bild der Welt wieder, sollen aber für unsere Zwecke genügen.

1.1 Auflistung sämtlicher Tabellen
The relational schema of the Mondial database

Country: the countries (and similar areas) of the world with some data.
   name: the country name
   code: the car code
   capital: the name of the capital
   province: the province where the capital belongs to
   area: the total area
   population: the population number

Economy: economical information about the countries.
   country: the country code
   GDP: gross domestic product (in million $)
   agriculture: percentage of agriculture of the GDP
   service: percentage of services of the GDP
   industry: percentage of industry of the GDP
   inflation: inflation rate (per annum)

Population: information about the population of the countries.
   country: the country code
   population growth: population growth rate (per annum)
   infant mortality: infant mortality (per thousand)

Politics: political information about the countries.
   country: the country code
   independence: date of independence (if independent)
   wasdependent: the plotical body where the area was dependent of; usually a country (but not always).
   dependent: the country code where the area belongs to
   government: type of government

Language: information about the languages spoken in a country
   country: the country code
   name: name of the language
   percentage: percentage of the language in this country

Religion: information about the religions in a country
   country: the country code
   name: name of the religion
   percentage: percentage of the language in this country

EthnicGroup: information about the ethnic groups in a country
   country: the country code
   name: name of the religion
   percentage: percentage of the language in this country

borders: informations about neighboring countries. Note that in this relation, for every pair of neighboring countries (A,B), only one tuple is given – thus, the relation is not symmetric.
   country1: a country code
   country2: a country code
   length: length of the border between country1 and country2

Continent: Information about continents.
   name: name of the continent
   area: total area of the continent

encompasses: information to which continents a country belongs.
country: the country code
continent: the continent name
percentage: percentage, how much of the area of a country belongs to the continent

City: information about cities.
name: the name of the city
country: the country code where it belongs to
province: the name of the province where it belongs to
population: population of the city
elevation: the elevation (above sea level) of the city
longitude: geographic longitude
latitude: geographic latitude

Province: information about administrative divisions.
name: the name of the administrative division
country: the country code where it belongs to
area: the total area of the province
population: the population of the province
capital: the name of the capital
capprov: the name of the province where the capital belongs to
note that capprov is not necessarily equal to name. E.g., the municipality of Bogota (Columbia) is a province of its own, and Bogota is the capital of the surrounding province Cudinamarena.

Organization: information about political and economical organizations.
name: the full name of the organization
abbreviation: its abbreviation
city: the city where the headquarter is located
country: the country code where the headquarter is located
province: the province where the headquarter is located
established: date of establishment

isMember: memberships in political and economical organizations.
organization: the abbreviation of the organization
country: the code of the member country
type: the type of membership

Lake: information about lakes.
name: the name of the lake
area: the total area of the lake
depth: the depth of the lake
elevation: the elevation (above sea level) of the lake
river: the river that flows out of the lake (may be null)
type: the type of the lake, e.g., salt, caldera, ...
coordinates: its geographical coordinates as (longitude, latitude)

Sea: information about seas.
name: the name of the sea
depth: the maximal depth of the sea

River: information about rivers.
name: the name of the river
length: the length of the river
river: the river where it finally flows to
lake: the lake where it finally flows to
sea: the sea where it finally flows to; 
   (note that at most one out of \{river, lake, sea\} can be non-null)
source: the coordinates of its source
sourceElevation: the elevation (above sea level) of its source
mountains: the mountains where its source is located
estuary: the coordinates of its estuary

**RiverThrough:** information about rivers flowing through lakes.
river: the name of the river
lake: the lake where it flows through

**Mountain:** information about mountains
name: the name of the mountain
mountains: the mountains where it belongs to
elevation: the maximal elevation of the summit of the mountain
type: the type of the mountain, e.g. volcanic, (active) volcano, ...
coordinates: its geographical coordinates as (longitude, latitude)

**Island:** information about islands
name: the name of the island
islands: the group of islands where it belongs to
area: the area of the island
elevation: the maximal elevation of the island
type: the type of the island, e.g. volcanic, coral, atoll, ...
coordinates: its geographical coordinates as (longitude, latitude)

**Desert:** information about deserts.
name: the name of the desert
area: the total area of the desert
coordinates: its geographical coordinates as (longitude, latitude)

**geo_Mountain:** geographical information about mountains
mountain: the name of the mountain
country: the country code where it is located
province: the province of this country

Note that for a country there can be several provinces where the mountain is located in.
Analogous for **geo_island**, **geo_desert**, **geo_river**, **geo_lake**, **geo_sea**. Analogously, there are also
**geo_source** and **geo_estuary**.

**mergesWith:** information about neighboring seas. Note that in this relation, for every pair of
   neighboring seas \((A, B)\), only one tuple is given – thus, the relation is *not* symmetric.
sea1: a sea
sea2: a sea

**located:** information about cities located at rivers, lakes, and seas.
city: the name of the city
country: the country code where the city belongs to
province: the province where the city belongs to
river: the river where it is located at
lake: the lake where it is located at
sea: the sea where it is located at

Note that for a given city, there can be several lakes/seas/rivers where it is located at.

**locatedOn:** information about cities located in islands.
city: the name of the city
country: the country code where the city belongs to
province: the province where the city belongs to
island: the island it is (maybe only partially) located on
Note that for a given city, there can be several islands where it is located on.

islandIn: information the waters where the islands are located in.
island: the name of the island
sea: the sea where the island is located in
lake: the sea where the island is located in
river: the sea where the island is located in
Note that an island can have coasts to several seas.

MountainOnIsland: information which mountains are located in islands.
mountain: the name of the mountain
island: the name of the island
Incrementally extended version: Mondial-II, 2012
1.2  Relationales Schema der Datenbank
1.3 Darstellung von Verknüpfungen zwischen einzelnen Tabellen
Referential Dependencies of the Mondial Database

Organization
- name
- abbreviation
- city
- country
- province
- established

isMember
- < organization
- < country
type

Country
- name
- code
- capital
- province
- area
- population

city
- < country
- < country
type

Province
- name
- country
- area
- population
- capital
country
type

Continent
- name
- country
type

Language
- name
- country
type

Religion
- name
- country
type

EthnicGroup
- name
- country
type

Economy
- country
type

Population
- country
type

Politics
- country
type

Desert
- name
- area
type
country
type

Lake
- name
- country
type

River
- name
- country
type

Sea
- name
- country
type

Island
- name
- country
type

Mountain
- name
- country
type

Geo
- lake
- river
- source
- estuary
- sea
- island
- mountain

Geo dependencies are omitted.
Incrementally extended version: Mondial-II, 2012