

## Assignment #10: Data science with database/SQL

### Part 1: World Database

1. How many countries became independent in the twentieth century?

Your SQL query has been executed successfully.

```
SELECT COUNT(Name) FROM Country WHERE IndepYear >= '1900' AND IndepYear < '2000';
```

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

+ Options

COUNT(Name)
149

2. How many people in the world are expected to live for 75 years or more?

✓ Showing rows 0 - 0 (1 total, Query took 0.0008 seconds.)

```
SELECT SUM(Population) FROM Country WHERE LifeExpectancy >= '75';
```

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 ▾ Filter rows: Search this table

+ Options

SUM(Population)
982470200

3. List the 10 most populated countries in the world with their population as percentage of the world population.

```
✓ Showing rows 0 - 9 (10 total, Query took 0.0014 seconds.)
```

```
SELECT Name, (Population/ (SELECT SUM(Population) FROM Country)) * 100 AS pop_percentage FROM Country ORDER BY Population DESC LIMIT 10;
```

*Figure 1: Query*

China	21.0168
India	16.6755
United States	4.5792
Indonesia	3.4893
Brazil	2.7985
Pakistan	2.5743
Russian Federation	2.4172
Bangladesh	2.1247
Japan	2.0845
Nigeria	1.8344

*Figure 2: Result from Query in Figure 1*

4. List the top 10 countries with the highest population density.

```
✓ Showing rows 0 - 9 (10 total, Query took 0.0009 seconds.)
```

```
SELECT name, Population / SurfaceArea AS population_density FROM Country ORDER BY population_density DESC LIMIT 10;
```

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

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	name	population_density	1
<input type="checkbox"/>	 Edit  Copy  Delete Macao	26277.777778	
<input type="checkbox"/>	 Edit  Copy  Delete Monaco	22666.666667	
<input type="checkbox"/>	 Edit  Copy  Delete Hong Kong	6308.837209	
<input type="checkbox"/>	 Edit  Copy  Delete Singapore	5771.844660	
<input type="checkbox"/>	 Edit  Copy  Delete Gibraltar	4166.666667	
<input type="checkbox"/>	 Edit  Copy  Delete Holy See (Vatican City State)	2499.999963	
<input type="checkbox"/>	 Edit  Copy  Delete Bermuda	1226.415094	
<input type="checkbox"/>	 Edit  Copy  Delete Malta	1203.164557	
<input type="checkbox"/>	 Edit  Copy  Delete Maldives	959.731544	
<input type="checkbox"/>	 Edit  Copy  Delete Bangladesh	896.922179	

## Part 2: AIS Dynamic Data

1. How many unique vessels are available in the dataset?

Your SQL query has been executed successfully.

```
SELECT COUNT(DISTINCT sourcemmsi) AS unique_vessels FROM maritime;
```

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

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unique_vessels
10

2. List the number of records available for each vessel in the dataset.

✓ Showing rows 0 - 9 (10 total, Query took 0.0034 seconds.)

```
SELECT sourcemmsi, COUNT(*) as num_records FROM maritime GROUP BY sourcemmsi ORDER BY num_records DESC;
```

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 ▾ Filter rows: Search this table

+ Options

sourcemmsi	num_records
2115	2201
2059	1980
2051	280
111224102	43
1178	35
111232528	11
111232526	7
111232506	7
111232504	1
227909090	1

3. Find out the spatial (latitude and longitude) and temporal coverage of each vessel in the dataset.

```

1 SELECT sourcemmsi,
2      MIN(lat) AS min_lat,
3      MAX(lat) AS max_lat,
4      MIN(lon) AS min_lon,
5      MAX(lon) AS max_lon,
6      MIN(ts) AS min_ts,
7      MAX(ts) AS max_ts
8 FROM maritime
9 GROUP BY sourcemmsi;

```

*Figure 3: Query*

sourcemmsi	min_lat	max_lat	min_lon	max_lon	min_ts	max_ts
1178	47.829933	48.038720	-5.19096000	-4.53996850	1453824987	1453825666
2051	45.570015	48.976734	-6.25257350	-1.19865000	1457440726	1459443235
2059	47.688892	48.827570	-5.39479500	-1.57520160	1444921091	1453286640
2115	46.028553	48.018158	-5.73894500	-0.96652335	1443688426	1457618469
111224102	45.179054	45.544548	-8.92648700	-8.20939350	1443898591	1445456003
111232504	50.812250	50.812250	-1.62229340	-1.62229340	1450020821	1450020821
111232506	50.156933	50.244972	-4.01459650	-3.68760820	1450017500	1450018740
111232526	49.565320	50.196760	-5.18426500	-4.91575000	1448991835	1458950324
111232528	49.356650	50.035587	-5.07344150	-5.00985500	1451746131	1453647221
227909090	48.683130	48.683130	-2.80205500	-2.80205500	1450705351	1450705351

*Figure 4: Result from Query in Figure 3*