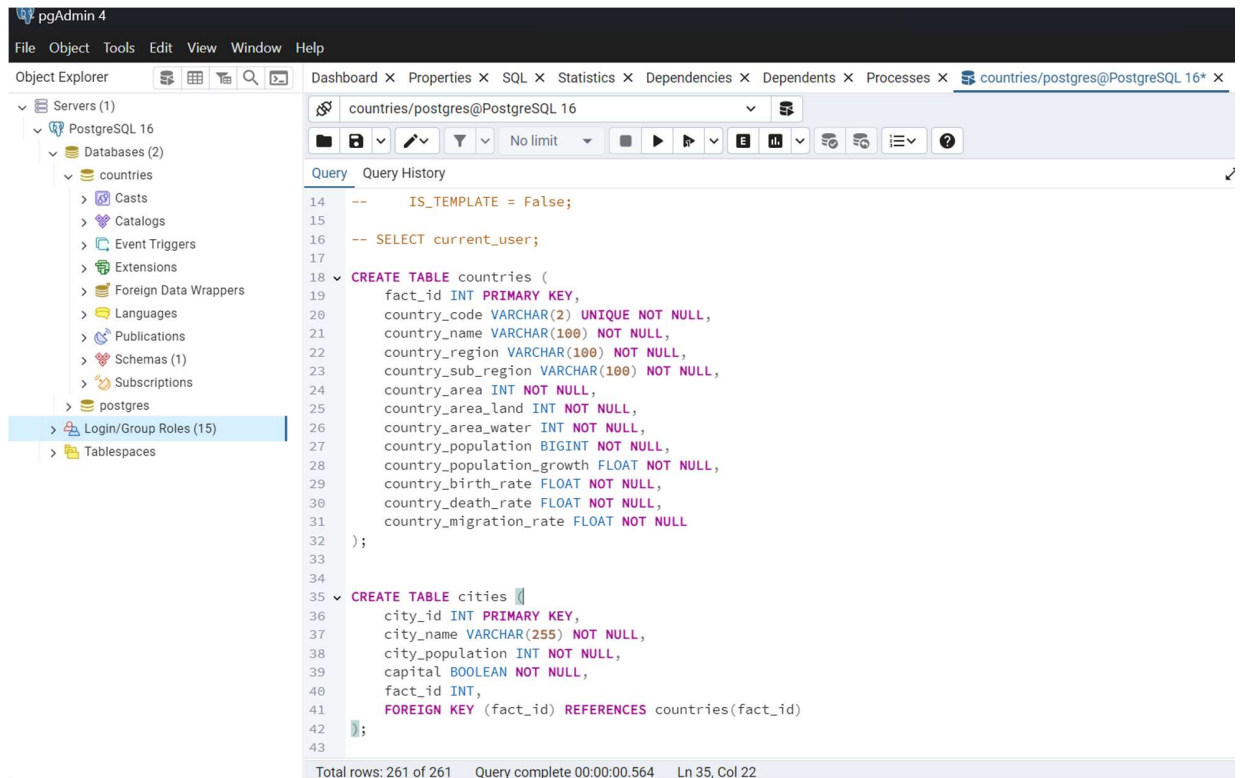


Homework Assignment 4: SQL

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1. Create a SQL database tables for both datasets countries.csv and cities.csv separately, using a RDBMS (PostgreSQL preferred).



The screenshot shows the pgAdmin 4 web interface. On the left, the 'Object Explorer' pane shows a tree structure with 'Servers (1)' containing 'PostgreSQL 16', which has 'Databases (2)' including 'countries' and 'postgres'. The 'countries' database is selected. The main pane shows the 'Query' editor with the following SQL code:

```
14 -- IS_TEMPLATE = False;
15
16 -- SELECT current_user;
17
18 CREATE TABLE countries (
19     fact_id INT PRIMARY KEY,
20     country_code VARCHAR(2) UNIQUE NOT NULL,
21     country_name VARCHAR(100) NOT NULL,
22     country_region VARCHAR(100) NOT NULL,
23     country_sub_region VARCHAR(100) NOT NULL,
24     country_area INT NOT NULL,
25     country_area_land INT NOT NULL,
26     country_area_water INT NOT NULL,
27     country_population BIGINT NOT NULL,
28     country_population_growth FLOAT NOT NULL,
29     country_birth_rate FLOAT NOT NULL,
30     country_death_rate FLOAT NOT NULL,
31     country_migration_rate FLOAT NOT NULL
32 );
33
34
35 CREATE TABLE cities (
36     city_id INT PRIMARY KEY,
37     city_name VARCHAR(255) NOT NULL,
38     city_population INT NOT NULL,
39     capital BOOLEAN NOT NULL,
40     fact_id INT,
41     FOREIGN KEY (fact_id) REFERENCES countries(fact_id)
42 );
43
```

At the bottom, the status bar indicates 'Total rows: 261 of 261', 'Query complete 00:00:00.564', and 'Ln 35, Col 22'.

2. Load/Import the dataset into the table.

	fact_id [PK] integer	country_code character varying (2)	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	country_area integer	country_area_land integer	country_area_water integer
1	1	af	Afghanistan	Asia	Southern Asia	652230	652230	0
2	2	al	Albania	Europe	Southern Europe	28748	27398	1350
3	3	ag	Algeria	Africa	Northern Africa	2381741	2381741	0
4	4	an	Andorra	Europe	Southern Europe	468	468	0
5	5	ao	Angola	Africa	Sub-Saharan Africa	1246700	1246700	0
6	6	ac	Antigua and Barbuda	Americas	Latin America and the Caribbean	442	442	0
7	7	ar	Argentina	Americas	Latin America and the Caribbean	2780400	2736690	43710
8	8	am	Armenia	Asia	Western Asia	29743	28203	1540
9	9	as	Australia	Oceania	Australia and New Zealand	7741220	7682300	58920
10	10	au	Austria	Europe	Western Europe	83871	82445	1426
11	11	aj	Azerbaijan	Asia	Western Asia	86600	82629	3971
12	12	bf	Bahamas, The	NA	NA	13880	10010	3870
13	13	ba	Bahrain	Asia	Western Asia	760	760	0
14	14	bg	Bangladesh	Asia	Southern Asia	148460	130170	18290
15	15	bb	Barbados	Americas	Latin America and the Caribbean	430	430	0
16	16	bo	Belarus	Europe	Eastern Europe	207600	202900	4700
17	17	be	Belgium	Europe	Western Europe	30528	30278	250
18	18	bh	Belize	Americas	Latin America and the Caribbean	22966	22806	160
19	19	bn	Benin	Africa	Sub-Saharan Africa	112622	110622	2000
20	20	bt	Bhutan	Asia	Southern Asia	38394	38394	0
21	21	bl	Bolivia	Americas	Latin America and the Caribbean	1098581	1083301	15280
22	22	bk	Bosnia and Herzegovina	Europe	Southern Europe	51197	51187	10
23	23	bc	Botswana	Africa	Sub-Saharan Africa	581730	566730	15000

country_population bigint	country_population_growth double precision	country_birth_rate double precision	country_death_rate double precision	country_migration_rate double precision
32564342	2.32	38.57	13.89	1.51
3029278	0.3	12.92	6.58	3.3
39542166	1.84	23.67	4.31	0.92
85580	0.12	8.13	6.96	0
19625353	2.78	38.78	11.49	0.46
92436	1.24	15.85	5.69	2.21
43431886	0.93	16.64	7.33	0
3056382	0.15	13.61	9.34	5.8
22751014	1.07	12.15	7.14	5.65
8665550	0.55	9.41	9.42	5.56
9780780	0.96	16.64	7.07	0
324597	0.85	15.5	7.05	0
1346613	2.41	13.66	2.69	13.09
168957745	1.6	21.14	5.61	0.46
290604	0.31	11.87	8.44	0.3
9589689	0.2	10.7	13.36	0.7
11323973	0.76	11.41	9.63	5.87
347369	1.87	24.68	5.97	0
10448647	2.78	36.02	8.21	0
741919	1.11	17.78	6.69	0
10800882	1.56	22.76	6.52	0.62
3867055	0.13	8.87	9.75	0.38
2182719	1.21	20.96	13.39	4.56

	city_id [PK] integer	city_name character varying (255)	city_population integer	capital boolean	fact_id integer
1	1	Oranjestad	37000	true	216
2	2	Saint John'S	27000	true	6
3	3	Abu Dhabi	942000	true	184
4	4	Dubai	1978000	false	184
5	5	Sharjah	983000	false	184
6	6	Kabul	3097000	true	1
7	7	Algiers	2916000	true	3
8	8	Oran	783000	false	3
9	9	Baku	2123000	true	11
10	10	Tirana	419000	true	2
11	11	Yerevan	1116000	true	8
12	12	Andorra La Vella	23000	true	4
13	13	Luanda	5068000	true	5
14	14	Huambo	1098000	false	5
15	15	Pago Pago	64000	true	242
16	16	Buenos Aires	13528000	true	7
17	17	Cordoba	1556000	false	7
18	18	Rosario	1283000	false	7
19	19	Mendoza	957000	false	7
20	20	San Miguel de Tucuman	868000	false	7
21	21	La Plata	759000	false	7
22	22	Sydney	4543000	false	9
23	23	Melbourne	3961000	false	9

3. Query the database tables and interpret the results, displaying:

- a. the count of total number of records in each table.

```
56 select count(*) as total_countries from countries;
```

```
57
```

Data Output Messages Notifications

	total_countries bigint
1	261

58	<code>select count(*) as total_cities from cities;</code>				
59					
Data Output Messages Notifications					
<div> <div>≡</div> <div>📄</div> <div>▼</div> <div>📋</div> <div>▼</div> <div>🗑️</div> <div>🗄️</div> <div>⬇️</div> <div>📈</div> <div>SQL</div> </div>					
	<table> <tr> <th></th><th>total_cities bigint</th></tr> <tr> <td>1</td><td>397</td></tr> </table>		total_cities bigint	1	397
	total_cities bigint				
1	397				

- b. the count of the number of cities for each country in descending order of count (use group by)

```





60  select countries.country_name, count(cities.city_id) as city_count
61  from cities
62  join countries on cities.fact_id = countries.fact_id
63  group by countries.country_name
64  order by city_count desc;



```

	country_name character varying (100)	city_count bigint
1	South Africa	7
2	China	6
3	Russia	6
4	France	6
5	Venezuela	6
6	Colombia	6
7	Canada	6
8	Korea, South	6
9	Morocco	6
10	Indonesia	6
11	Iraq	6
12	India	6
13	Iran	6
14	Ukraine	6
15	United States	6
16	Brazil	6
17	Japan	6
18	Pakistan	6

	country_name character varying (100)	city_count bigint
19	Italy	6
20	United Kingdom	6
21	Turkey	6
22	Nigeria	6
23	Australia	6
24	Mexico	6
25	Argentina	6
26	Saudi Arabia	5
27	Congo, Democratic Republic of the	5
28	Germany	4
29	Syria	4
30	Philippines	4
31	Bangladesh	4
32	Vietnam	4
33	Malaysia	3
34	Spain	3
35	United Arab Emirates	3
36	Chile	3

	country_name character varying (100)	city_count bigint
37	Israel	3
38	Bolivia	3
39	Burma	3
40	Netherlands	3
41	Thailand	2
42	Switzerland	2
43	Mozambique	2
44	Kazakhstan	2
45	Belgium	2
46	Peru	2
47	Sri Lanka	2
48	Congo, Republic of the	2
49	Portugal	2
50	Angola	2
51	Cameroon	2
52	Benin	2
53	Yemen	2
54	Egypt	2

	country_name character varying (100) 	city_count bigint 
55	Greece	2
56	Cote d'Ivoire	2
57	Algeria	2
58	Kenya	2
59	Poland	2
60	Ecuador	2
61	New Zealand	2
62	Ghana	2
63	Lebanon	1
64	Turks and Caicos Islands	1
65	Virgin Islands	1
66	Falkland Islands (Islas Malvinas)	1
67	Kiribati	1
68	Uganda	1
69	Montenegro	1
70	Jordan	1
71	Macedonia	1
72	Papua New Guinea	1
	country_name character varying (100) 	city_count bigint 
73	American Samoa	1
74	Uzbekistan	1
75	Brunei	1
76	Finland	1
77	Grenada	1
78	Cayman Islands	1
79	Cuba	1
80	Kyrgyzstan	1
81	Djibouti	1
82	Senegal	1
83	Iceland	1
84	Madagascar	1
85	Sierra Leone	1
86	Tuvalu	1
87	Cabo Verde	1
88	Guinea	1
89	Rwanda	1
90	Zimbabwe	1

	country_name character varying (100) 	city_count bigint 
91	Comoros	1
92	Saint Lucia	1
93	Belarus	1
94	Lesotho	1
95	Paraguay	1
96	Mauritius	1
97	Gambia, The	1
98	Bahrain	1
99	Saint Pierre and Miquelon	1
100	Saint Helena, Ascension, and Tristan da Cunha	1
101	Malawi	1
102	Burundi	1
103	Bhutan	1
104	Togo	1
105	Burkina Faso	1
106	Faroe Islands	1
107	Bahamas, The	1
108	Oman	1

	country_name character varying (100)	city_count bigint		country_name character varying (100)	city_count bigint
109	Fiji	1			
110	Palau	1	139	Tonga	1
111	Anguilla	1	140	Nepal	1
112	Bermuda	1	141	Tanzania	1
113	Liechtenstein	1	142	Greenland	1
114	Puerto Rico	1	143	Costa Rica	1
115	French Polynesia	1	144	Haiti	1
116	Estonia	1	145	Samoa	1
117	Central African Republic	1	146	Equatorial Guinea	1
118	Denmark	1	147	Antigua and Barbuda	1
119	Trinidad and Tobago	1	148	Somalia	1
120	Mongolia	1	149	Andorra	1
121	Mauritania	1	150	Luxembourg	1
122	Seychelles	1	151	Czech Republic	1
123	Northern Mariana Islands	1	152	Sweden	1
124	Hungary	1	153	Dominican Republic	1
125	Honduras	1	154	Ireland	1
126	Belize	1	155	Cambodia	1
127	Botswana	1	156	Laos	1
128	Romania	1	157	Malta	1
129	Austria	1	158	Albania	1
130	Guinea-Bissau	1	159	Sao Tome and Principe	1
131	Niger	1	160	Latvia	1
132	Western Sahara	1	161	Maldives	1
133	Lithuania	1	162	Slovakia	1
134	Bulgaria	1	163	Micronesia, Federated States of	1
135	Turkmenistan	1	164	Zambia	1
136	Croatia	1	165	Kuwait	1
137	Aruba	1	166	Liberia	1
138	Nicaragua	1	167	Bosnia and Herzegovina	1
			168	Cyprus	1

	country_name character varying (100)	city_count bigint
169	Tajikistan	1
170	Guam	1
171	New Caledonia	1
172	Armenia	1
173	Qatar	1
174	Gabon	1
175	Dominica	1
176	Serbia	1
177	British Virgin Islands	1
178	Libya	1
179	Vanuatu	1
180	Wallis and Futuna	1
181	Georgia	1
182	Solomon Islands	1
183	El Salvador	1
184	Uruguay	1
185	Eritrea	1
186	Barbados	1
187	Saint Vincent and the Grenadines	1
188	Namibia	1
189	Marshall Islands	1
190	Slovenia	1
191	Azerbaijan	1
192	Afghanistan	1
193	Chad	1
194	Timor-Leste	1
195	Saint Kitts and Nevis	1
196	Suriname	1
197	Isle of Man	1
198	Jamaica	1

199	Korea, North	1
200	Norway	1
201	Guatemala	1
202	Ethiopia	1
203	Panama	1
204	South Sudan	1
205	Tunisia	1
206	Sudan	1
207	Mali	1
208	Swaziland	1
209	Moldova	1
210	Guyana	1

- c. the count of regions and sub-regions in each country. Sort them by ascending order of country name. (use group by)

```

66  select country_name, country_region, country_sub_region,
67         count(country_region) as region_count,
68         count(country_sub_region) as sub_region_count
69  from countries
70  group by country_name, country_region, country_sub_region
71  order by country_name asc;

```

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
1	Afghanistan	Asia	Southern Asia	1	1
2	Akrotiri	NA	NA	1	1
3	Albania	Europe	Southern Europe	1	1
4	Algeria	Africa	Northern Africa	1	1
5	American Samoa	Oceania	Polynesia	1	1
6	Andorra	Europe	Southern Europe	1	1
7	Angola	Africa	Sub-Saharan Africa	1	1
8	Anguilla	Americas	Latin America and the Caribbean	1	1
9	Antarctica	NA	NA	1	1
10	Antigua and Barbuda	Americas	Latin America and the Caribbean	1	1
11	Arctic Ocean	NA	NA	1	1
12	Argentina	Americas	Latin America and the Caribbean	1	1
13	Armenia	Asia	Western Asia	1	1
14	Aruba	Americas	Latin America and the Caribbean	1	1
15	Ashmore and Cartier Islands	NA	NA	1	1
16	Atlantic Ocean	NA	NA	1	1
17	Australia	Oceania	Australia and New Zealand	1	1
18	Austria	Europe	Western Europe	1	1
19	Azerbaijan	Asia	Western Asia	1	1
20	Bahamas, The	NA	NA	1	1
21	Bahrain	Asia	Western Asia	1	1
22	Bangladesh	Asia	Southern Asia	1	1
23	Barbados	Americas	Latin America and the Caribbean	1	1
24	Belarus	Europe	Eastern Europe	1	1
25	Belgium	Europe	Western Europe	1	1
26	Belize	Americas	Latin America and the Caribbean	1	1
27	Benin	Africa	Sub-Saharan Africa	1	1
28	Bermuda	Americas	Northern America	1	1
29	Bhutan	Asia	Southern Asia	1	1
30	Bolivia	Americas	Latin America and the Caribbean	1	1
31	Bosnia and Herzegovina	Europe	Southern Europe	1	1
32	Botswana	Africa	Sub-Saharan Africa	1	1
33	Bouvet Island	Americas	Latin America and the Caribbean	1	1
34	Brazil	Americas	Latin America and the Caribbean	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
35	British Indian Ocean Territory	Africa	Sub-Saharan Africa	1	1
36	British Virgin Islands	NA	NA	1	1
37	Brunei	NA	NA	1	1
38	Bulgaria	Europe	Eastern Europe	1	1
39	Burkina Faso	Africa	Sub-Saharan Africa	1	1
40	Burma	NA	NA	1	1
41	Burundi	Africa	Sub-Saharan Africa	1	1
42	Cabo Verde	Africa	Sub-Saharan Africa	1	1
43	Cambodia	Asia	South-eastern Asia	1	1
44	Cameroon	Africa	Sub-Saharan Africa	1	1
45	Canada	Americas	Northern America	1	1
46	Cayman Islands	Americas	Latin America and the Caribbean	1	1
47	Central African Republic	Africa	Sub-Saharan Africa	1	1
48	Chad	Africa	Sub-Saharan Africa	1	1
49	Chile	Americas	Latin America and the Caribbean	1	1
50	China	Asia	Eastern Asia	1	1
51	Christmas Island	Oceania	Australia and New Zealand	1	1
52	Clipperton Island	NA	NA	1	1
53	Cocos (Keeling) Islands	Oceania	Australia and New Zealand	1	1
54	Colombia	Americas	Latin America and the Caribbean	1	1
55	Comoros	Africa	Sub-Saharan Africa	1	1
56	Congo, Democratic Republic of the	NA	NA	1	1
57	Congo, Republic of the	NA	NA	1	1
58	Cook Islands	Oceania	Polynesia	1	1
59	Coral Sea Islands	NA	NA	1	1
60	Costa Rica	Americas	Latin America and the Caribbean	1	1
61	Cote d'Ivoire	NA	NA	1	1
62	Croatia	Europe	Southern Europe	1	1
63	Cuba	Americas	Latin America and the Caribbean	1	1
64	Curacao	NA	NA	1	1
65	Cyprus	Asia	Western Asia	1	1
66	Czech Republic	Europe	Eastern Europe	1	1
67	Denmark	Europe	Northern Europe	1	1
68	Dhekelia	NA	NA	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
69	Djibouti	Africa	Sub-Saharan Africa	1	1
70	Dominica	Americas	Latin America and the Caribbean	1	1
71	Dominican Republic	Americas	Latin America and the Caribbean	1	1
72	Ecuador	Americas	Latin America and the Caribbean	1	1
73	Egypt	Africa	Northern Africa	1	1
74	El Salvador	Americas	Latin America and the Caribbean	1	1
75	Equatorial Guinea	Africa	Sub-Saharan Africa	1	1
76	Eritrea	Africa	Sub-Saharan Africa	1	1
77	Estonia	Europe	Northern Europe	1	1
78	Ethiopia	Africa	Sub-Saharan Africa	1	1
79	European Union	NA	NA	1	1
80	Falkland Islands (Islas Malvinas)	NA	NA	1	1
81	Faroe Islands	Europe	Northern Europe	1	1
82	Fiji	Oceania	Melanesia	1	1
83	Finland	Europe	Northern Europe	1	1
84	France	Europe	Western Europe	1	1
85	French Polynesia	Oceania	Polynesia	1	1
86	French Southern and Antarctic Lands	NA	NA	1	1
87	Gabon	Africa	Sub-Saharan Africa	1	1
88	Gambia, The	NA	NA	1	1
89	Gaza Strip	NA	NA	1	1
90	Georgia	Asia	Western Asia	1	1
91	Germany	Europe	Western Europe	1	1
92	Ghana	Africa	Sub-Saharan Africa	1	1
93	Gibraltar	Europe	Southern Europe	1	1
94	Greece	Europe	Southern Europe	1	1
95	Greenland	Americas	Northern America	1	1
96	Grenada	Americas	Latin America and the Caribbean	1	1
97	Guam	Oceania	Micronesia	1	1
98	Guatemala	Americas	Latin America and the Caribbean	1	1
99	Guernsey	Europe	Northern Europe	1	1
100	Guinea	Africa	Sub-Saharan Africa	1	1
101	Guinea-Bissau	NA	NA	1	1
102	Guyana	Americas	Latin America and the Caribbean	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
103	Haiti	Americas	Latin America and the Caribbean	1	1
104	Heard Island and McDonald Islands	Oceania	Australia and New Zealand	1	1
105	Holy See (Vatican City)	NA	NA	1	1
106	Honduras	Americas	Latin America and the Caribbean	1	1
107	Hong Kong	Asia	Eastern Asia	1	1
108	Hungary	Europe	Eastern Europe	1	1
109	Iceland	Europe	Northern Europe	1	1
110	India	Asia	Southern Asia	1	1
111	Indian Ocean	NA	NA	1	1
112	Indonesia	Asia	South-eastern Asia	1	1
113	Iran	Asia	Southern Asia	1	1
114	Iraq	Asia	Western Asia	1	1
115	Ireland	Europe	Northern Europe	1	1
116	Isle of Man	Europe	Northern Europe	1	1
117	Israel	Asia	Western Asia	1	1
118	Italy	Europe	Southern Europe	1	1
119	Jamaica	Americas	Latin America and the Caribbean	1	1
120	Jan Mayen	NA	NA	1	1
121	Japan	Asia	Eastern Asia	1	1
122	Jersey	Europe	Northern Europe	1	1
123	Jordan	Asia	Western Asia	1	1
124	Kazakhstan	Asia	Central Asia	1	1
125	Kenya	Africa	Sub-Saharan Africa	1	1
126	Kiribati	Oceania	Micronesia	1	1
127	Korea, North	NA	NA	1	1
128	Korea, South	NA	NA	1	1
129	Kosovo	NA	NA	1	1
130	Kuwait	Asia	Western Asia	1	1
131	Kyrgyzstan	Asia	Central Asia	1	1
132	Laos	Asia	South-eastern Asia	1	1
133	Latvia	Europe	Northern Europe	1	1
134	Lebanon	Asia	Western Asia	1	1
135	Lesotho	Africa	Sub-Saharan Africa	1	1
136	Liberia	Africa	Sub-Saharan Africa	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
137	Libya	Africa	Northern Africa	1	1
138	Liechtenstein	Europe	Western Europe	1	1
139	Lithuania	Europe	Northern Europe	1	1
140	Luxembourg	Europe	Western Europe	1	1
141	Macao	NA	NA	1	1
142	Macedonia	Europe	Southern Europe	1	1
143	Madagascar	Africa	Sub-Saharan Africa	1	1
144	Malawi	Africa	Sub-Saharan Africa	1	1
145	Malaysia	Asia	South-eastern Asia	1	1
146	Maldives	Asia	Southern Asia	1	1
147	Mali	Africa	Sub-Saharan Africa	1	1
148	Malta	Europe	Southern Europe	1	1
149	Marshall Islands	Oceania	Micronesia	1	1
150	Mauritania	Africa	Sub-Saharan Africa	1	1
151	Mauritius	Africa	Sub-Saharan Africa	1	1
152	Mexico	Americas	Latin America and the Caribbean	1	1
153	Micronesia, Federated States of	NA	NA	1	1
154	Moldova	Europe	Eastern Europe	1	1
155	Monaco	Europe	Western Europe	1	1
156	Mongolia	Asia	Eastern Asia	1	1
157	Montenegro	Europe	Southern Europe	1	1
158	Montserrat	Americas	Latin America and the Caribbean	1	1
159	Morocco	Africa	Northern Africa	1	1
160	Mozambique	Africa	Sub-Saharan Africa	1	1
161	Namibia	Africa	Sub-Saharan Africa	1	1
162	Nauru	Oceania	Micronesia	1	1
163	Navassa Island	NA	NA	1	1
164	Nepal	Asia	Southern Asia	1	1
165	Netherlands	Europe	Western Europe	1	1
166	New Caledonia	Oceania	Melanesia	1	1
167	New Zealand	Oceania	Australia and New Zealand	1	1
168	Nicaragua	Americas	Latin America and the Caribbean	1	1
169	Niger	Africa	Sub-Saharan Africa	1	1
170	Nigeria	Africa	Sub-Saharan Africa	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
171	Niue	Oceania	Polynesia	1	1
172	Norfolk Island	Oceania	Australia and New Zealand	1	1
173	Northern Mariana Islands	Oceania	Micronesia	1	1
174	Norway	Europe	Northern Europe	1	1
175	Oman	Asia	Western Asia	1	1
176	Pacific Ocean	NA	NA	1	1
177	Pakistan	Asia	Southern Asia	1	1
178	Palau	Oceania	Micronesia	1	1
179	Panama	Americas	Latin America and the Caribbean	1	1
180	Papua New Guinea	Oceania	Melanesia	1	1
181	Paracel Islands	NA	NA	1	1
182	Paraguay	Americas	Latin America and the Caribbean	1	1
183	Peru	Americas	Latin America and the Caribbean	1	1
184	Philippines	Asia	South-eastern Asia	1	1
185	Pitcairn Islands	NA	NA	1	1
186	Poland	Europe	Eastern Europe	1	1
187	Portugal	Europe	Southern Europe	1	1
188	Puerto Rico	Americas	Latin America and the Caribbean	1	1
189	Qatar	Asia	Western Asia	1	1
190	Romania	Europe	Eastern Europe	1	1
191	Russia	Europe	Eastern Europe	1	1
192	Rwanda	Africa	Sub-Saharan Africa	1	1
193	Saint Barthelemy	NA	NA	1	1
194	Saint Helena, Ascension, and Tristan da Cu...	NA	NA	1	1
195	Saint Kitts and Nevis	Americas	Latin America and the Caribbean	1	1
196	Saint Lucia	Americas	Latin America and the Caribbean	1	1
197	Saint Martin	NA	NA	1	1
198	Saint Pierre and Miquelon	Americas	Northern America	1	1
199	Saint Vincent and the Grenadines	Americas	Latin America and the Caribbean	1	1
200	Samoa	Oceania	Polynesia	1	1
201	San Marino	Europe	Southern Europe	1	1
202	Sao Tome and Principe	Africa	Sub-Saharan Africa	1	1
203	Saudi Arabia	Asia	Western Asia	1	1
204	Senegal	Africa	Sub-Saharan Africa	1	1

	country_name character varying (100)	country_region character varying (100)	country_sub_region character varying (100)	region_count bigint	sub_region_count bigint
205	Serbia	Europe	Southern Europe	1	1
206	Seychelles	Africa	Sub-Saharan Africa	1	1
207	Sierra Leone	Africa	Sub-Saharan Africa	1	1
208	Singapore	Asia	South-eastern Asia	1	1
209	Sint Maarten	NA	NA	1	1
210	Slovakia	Europe	Eastern Europe	1	1
211	Slovenia	Europe	Southern Europe	1	1
212	Solomon Islands	Oceania	Melanesia	1	1
213	Somalia	Africa	Sub-Saharan Africa	1	1
214	South Africa	Africa	Sub-Saharan Africa	1	1
215	South Georgia and South Sandwich Islands	NA	NA	1	1
216	South Sudan	Africa	Sub-Saharan Africa	1	1
217	Southern Ocean	NA	NA	1	1
218	Spain	Europe	Southern Europe	1	1
219	Spratly Islands	NA	NA	1	1
220	Sri Lanka	Asia	Southern Asia	1	1
221	Sudan	Africa	Northern Africa	1	1
222	Suriname	Americas	Latin America and the Caribbean	1	1
223	Svalbard	NA	NA	1	1
224	Swaziland	NA	NA	1	1
225	Sweden	Europe	Northern Europe	1	1
226	Switzerland	Europe	Western Europe	1	1
227	Syria	Asia	Western Asia	1	1
228	Taiwan	Asia	Eastern Asia	1	1
229	Tajikistan	Asia	Central Asia	1	1
230	Tanzania	Africa	Sub-Saharan Africa	1	1
231	Thailand	Asia	South-eastern Asia	1	1
232	Timor-Leste	Asia	South-eastern Asia	1	1
233	Togo	Africa	Sub-Saharan Africa	1	1
234	Tokelau	Oceania	Polynesia	1	1
235	Tonga	Oceania	Polynesia	1	1
236	Trinidad and Tobago	Americas	Latin America and the Caribbean	1	1
237	Tunisia	Africa	Northern Africa	1	1
238	Turkey	Asia	Western Asia	1	1
239	Turkmenistan	Asia	Central Asia	1	1
240	Turks and Caicos Islands	Americas	Latin America and the Caribbean	1	1
241	Tuvalu	Oceania	Polynesia	1	1
242	Uganda	Africa	Sub-Saharan Africa	1	1
243	Ukraine	Europe	Eastern Europe	1	1
244	United Arab Emirates	Asia	Western Asia	1	1
245	United Kingdom	Europe	Northern Europe	1	1
246	United States	Americas	Northern America	1	1
247	United States Pacific Island Wildlife Refug...	NA	NA	1	1
248	Uruguay	Americas	Latin America and the Caribbean	1	1
249	Uzbekistan	Asia	Central Asia	1	1
250	Vanuatu	Oceania	Melanesia	1	1
251	Venezuela	Americas	Latin America and the Caribbean	1	1
252	Vietnam	Asia	South-eastern Asia	1	1
253	Virgin Islands	NA	NA	1	1
254	Wake Island	NA	NA	1	1
255	Wallis and Futuna	Oceania	Polynesia	1	1
256	West Bank	NA	NA	1	1
257	Western Sahara	Africa	Northern Africa	1	1
258	World	NA	NA	1	1
259	Yemen	Asia	Western Asia	1	1
260	Zambia	Africa	Sub-Saharan Africa	1	1
261	Zimbabwe	Africa	Sub-Saharan Africa	1	1

- d. Top 10 most populous capital cities. Display country, city and population in descending order.

```
73 v select countries.country_name, cities.city_name, cities.city_population
74 from cities
75 join countries on cities.fact_id = countries.fact_id
76 where cities.capital = True
77 order by cities.city_population desc
78 Limit 10;
79
```

Data Output Messages Notifications

	country_name character varying (100)	city_name character varying (255)	city_population integer
1	Japan	Tokyo	37217000
2	India	New Delhi	22654000
3	Mexico	Mexico City	20446000
4	China	Beijing	15594000
5	Bangladesh	Dhaka	15391000
6	Argentina	Buenos Aires	13528000
7	Philippines	Manila	11862000
8	Russia	Moscow	11621000
9	Egypt	Cairo	11169000
10	Indonesia	Jakarta	9769000

- e. Average city population of capital and non-capital cities. (use group by)

```
80 v select capital, avg(city_population) as avg_population
81 from cities
82 group by capital;
83
```

Data Output Messages Notifications

	capital boolean	avg_population numeric
1	false	2891392.063492063492
2	true	2140442.307692307692

- f. Average country birth rate for each region and sub-region (use group by)

```
84 v select country_region, country_sub_region, avg(country_birth_rate) as avg_birth_rate
85 from countries
86 group by country_region, country_sub_region
87 order by country_region, country_sub_region;
```

	country_region character varying (100) 🔒	country_sub_region character varying (100) 🔒	avg_birth_rate double precision 🔒
1	Africa	Northern Africa	22.695714285714285
2	Africa	Sub-Saharan Africa	32.40558139534885
3	Americas	Latin America and the Caribbean	15.891538461538458
4	Americas	Northern America	11.2
5	Asia	Central Asia	20.582
6	Asia	Eastern Asia	11.674000000000001
7	Asia	South-eastern Asia	19.817777777777778
8	Asia	Southern Asia	21.094444444444445
9	Asia	Western Asia	18.503529411764706
10	Europe	Eastern Europe	10.151999999999997
11	Europe	Northern Europe	11.662142857142856
12	Europe	Southern Europe	9.869333333333334
13	Europe	Western Europe	10.163333333333334
14	NA	NA	9.236458333333335
15	Oceania	Australia and New Zealand	4.246666666666667
16	Oceania	Melanesia	21.990000000000002
17	Oceania	Micronesia	19.7
18	Oceania	Polynesia	14.833333333333334