資料庫系統概論 HW2

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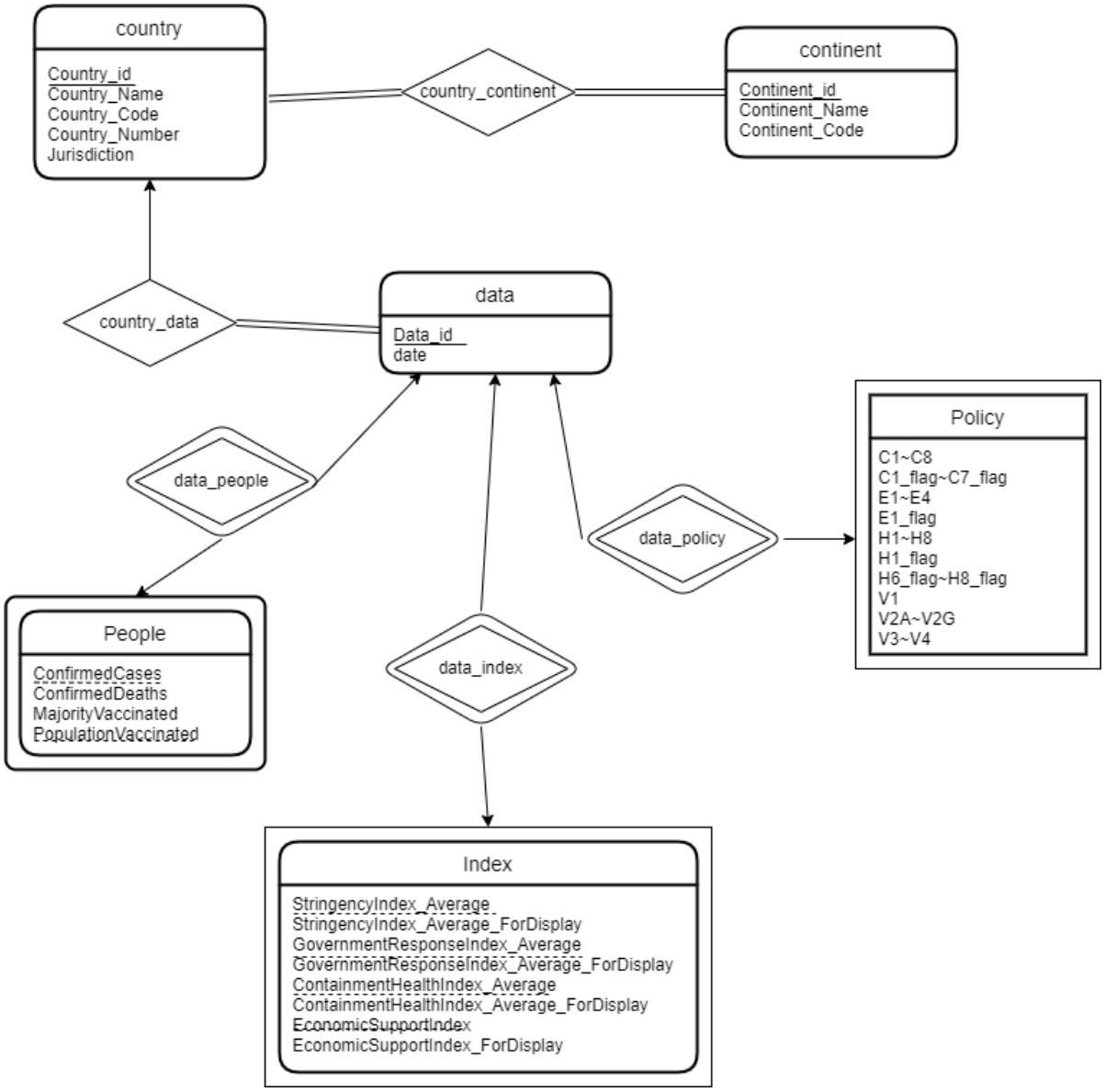
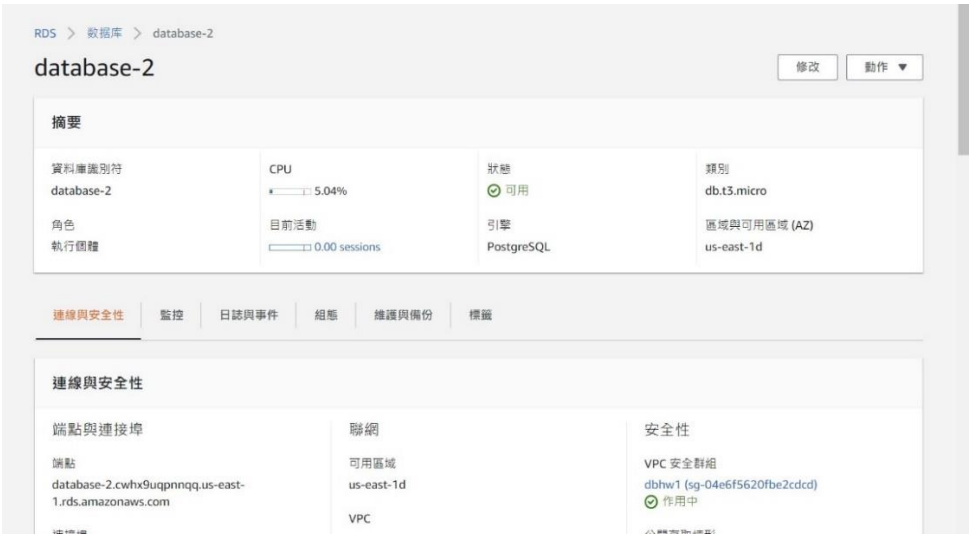
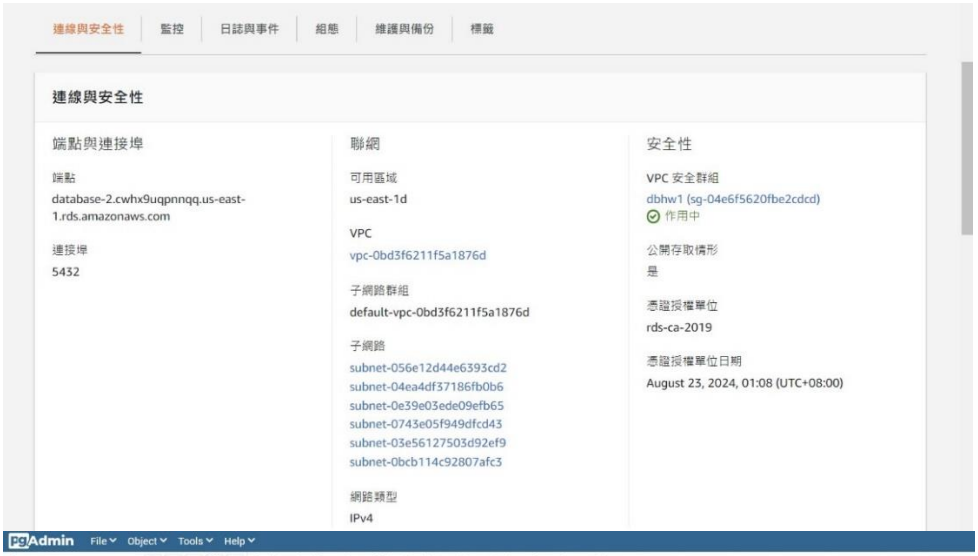
1. ER diagram

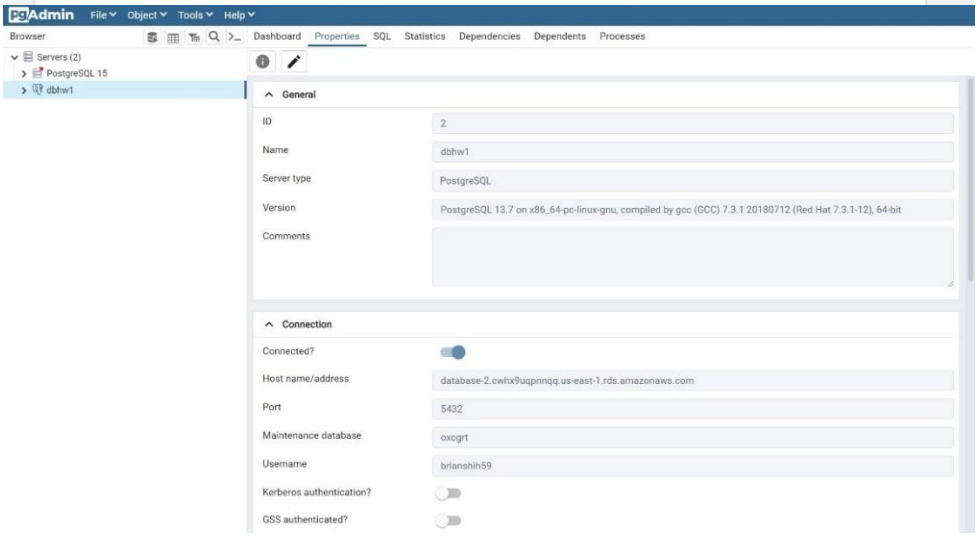


Since “RegionName”, “RegionCode”, “M1_Wildcard” in OxCGRT_nat_latest.csv have only NULL value, and I think “Two_Letter_Country_Code” in country-and-continent-codes-list-csv.csv are redundancy because we already have “Three_Letter_Country_Code”, so I ignore them in the ER diagram.

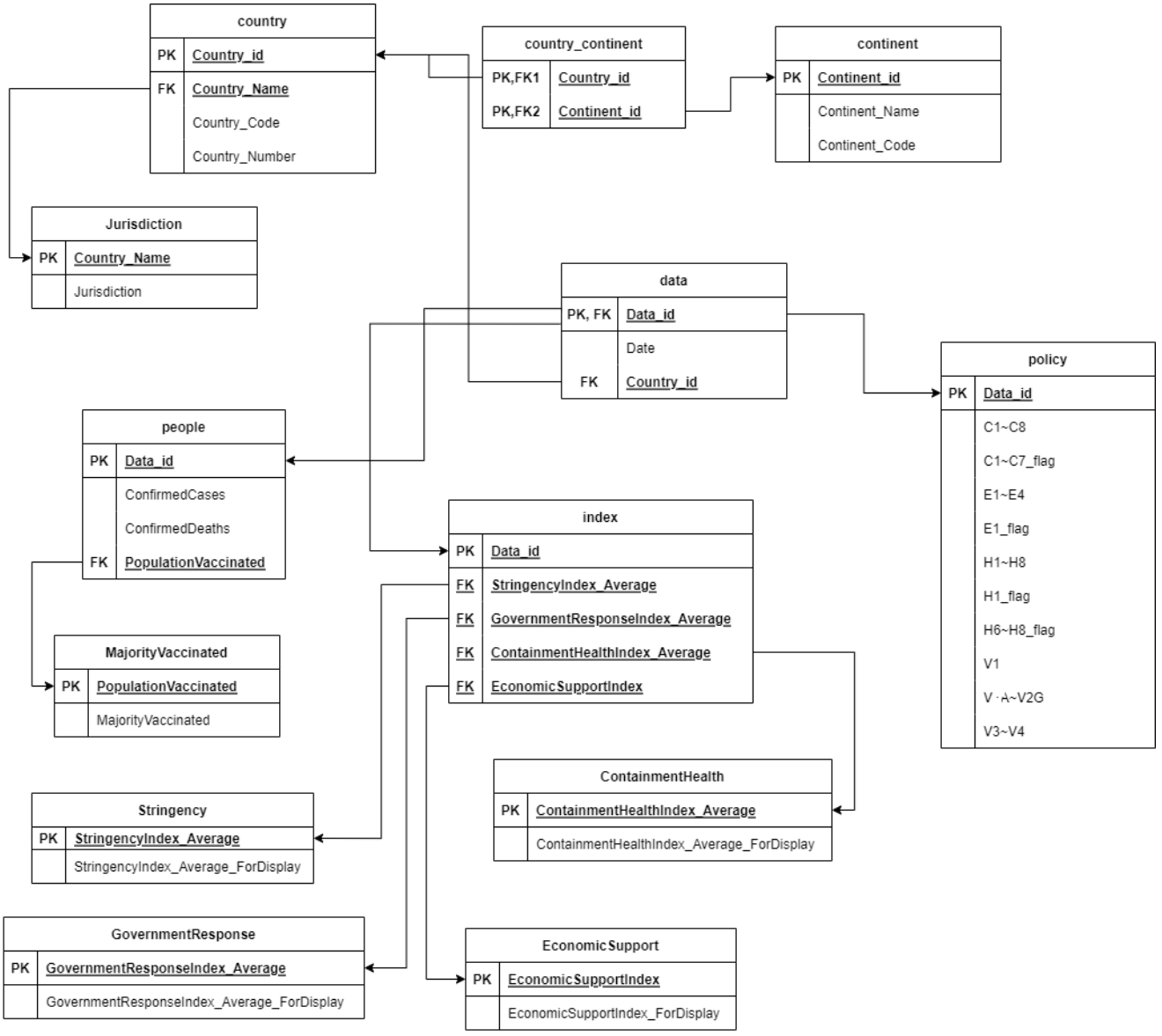
2. AWS RDS


RDS > 數據庫 > database-2
database-2
修改
動作
摘要
資料庫識別符
database-2
CPU
5.04%
狀態
可用
類別
db.t3.micro
角色
執行個體
目前活動
0.00 sessions
引擎
PostgreSQL
區域與可用區域 (AZ)
us-east-1d
連線與安全性
監控
日誌與事件
組態
維護與備份
標籤
連線與安全性
端點與連接埠
端點
database-2.cwhx9uqpnnqq.us-east-1.rds.amazonaws.com
聯網
可用區域
us-east-1d
VPC
安全性
VPC 安全群組
dbhw1 (sg-04e6f5620fbe2cdcd)
作用中


連線與安全性
監控
日誌與事件
組態
維護與備份
標籤
連線與安全性
端點與連接埠
端點
database-2.cwhx9uqpnnqq.us-east-1.rds.amazonaws.com
連接埠
5432
聯網
可用區域
us-east-1d
VPC
vpc-0bd3f6211f5a1876d
子網路群組
default-vpc-0bd3f6211f5a1876d
子網路
subnet-056e12d44e6393cd2
subnet-04ea4df37186fb0b6
subnet-0e39e03ede09efb65
subnet-0743e05f949dfcd43
subnet-03e56127503d92ef9
subnet-0bcb114c92807afc3
網路類型
IPv4
安全性
VPC 安全群組
dbhw1 (sg-04e6f5620fbe2cdcd)
作用中
公開存取情形
是
憑證授權單位
rds-ca-2019
憑證授權單位日期
August 23, 2024, 01:08 (UTC+08:00)

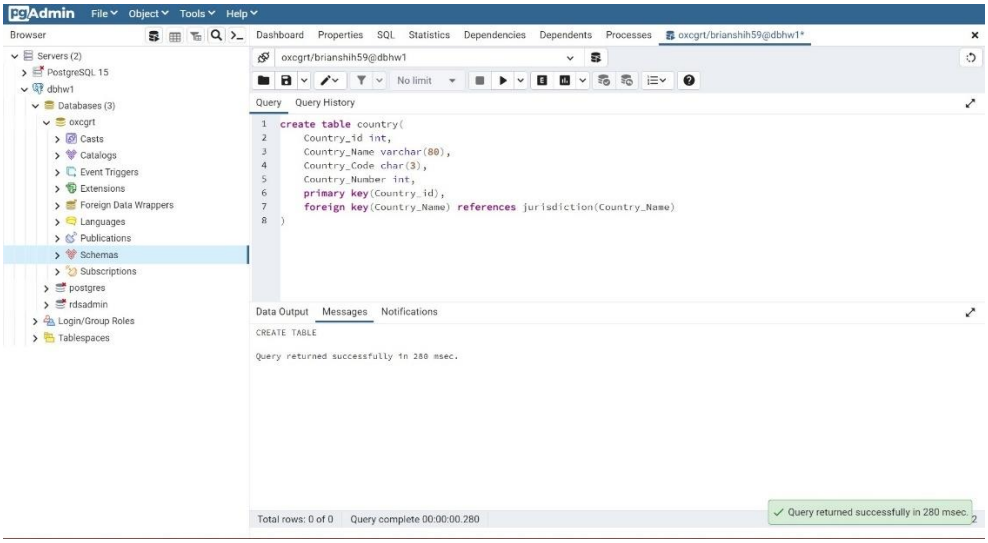

pgAdmin
File
Object
Tools
Help
Browser
Servers (2)
PostgreSQL 15
dbhw1
Dashboard
Properties
SQL
Statistics
Dependencies
Dependents
Processes
General
ID
2
Name
dbhw1
Server type
PostgreSQL
Version
PostgreSQL 13.7 on x86_64-pc-linux-gnu, compiled by gcc (GCC) 7.3.1 20180712 (Red Hat 7.3.1-12), 64-bit
Comments
Connection
Connected?
Host name/address
database-2.cwhx9uqpnnqq.us-east-1.rds.amazonaws.com
Port
5432
Maintenance database
oxcgrt
Username
brianshih59
Kerberos authentication?
GSS authenticated?

3. Relational schema

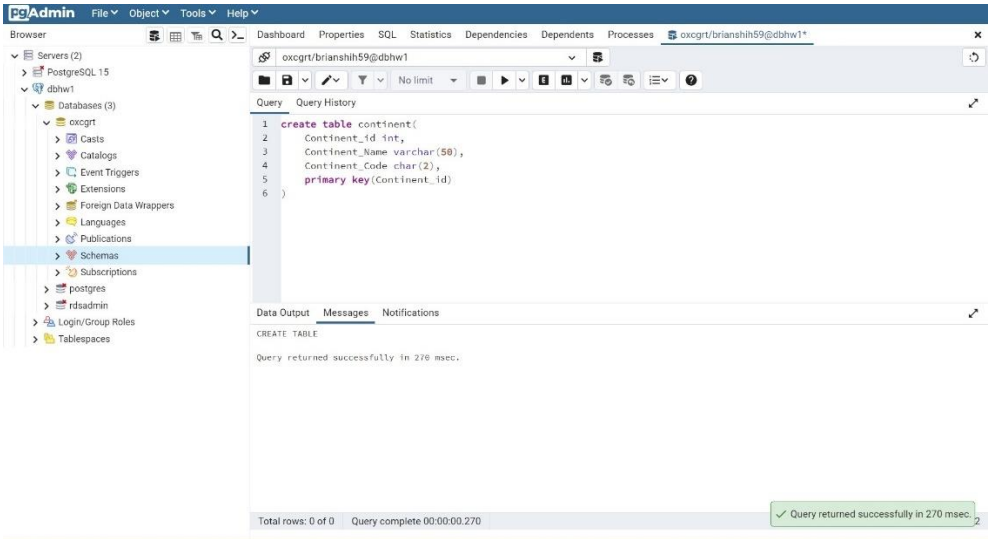


Since “Kosovo” is not included in country-and-continent-codes-list-csv.csv, so I add it manually.

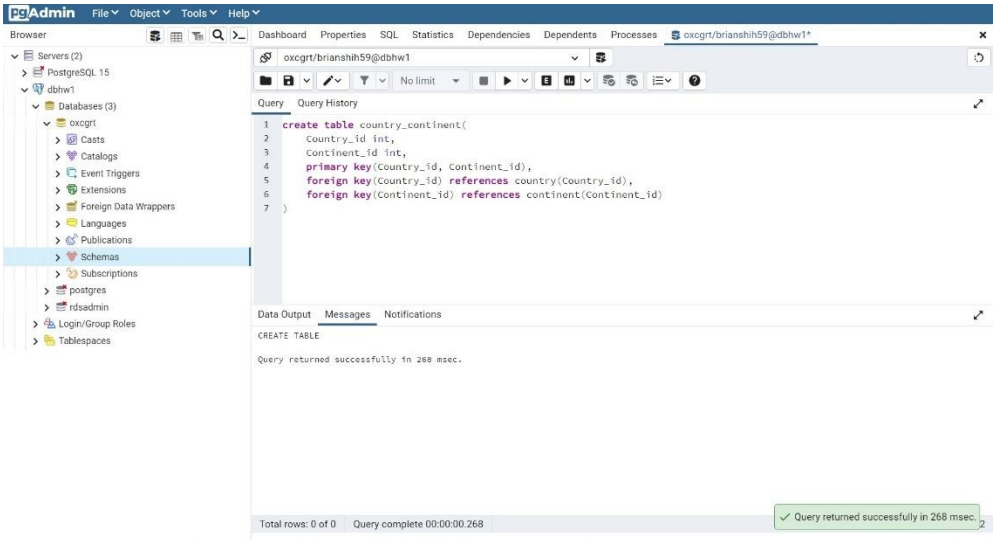
Create table “country”



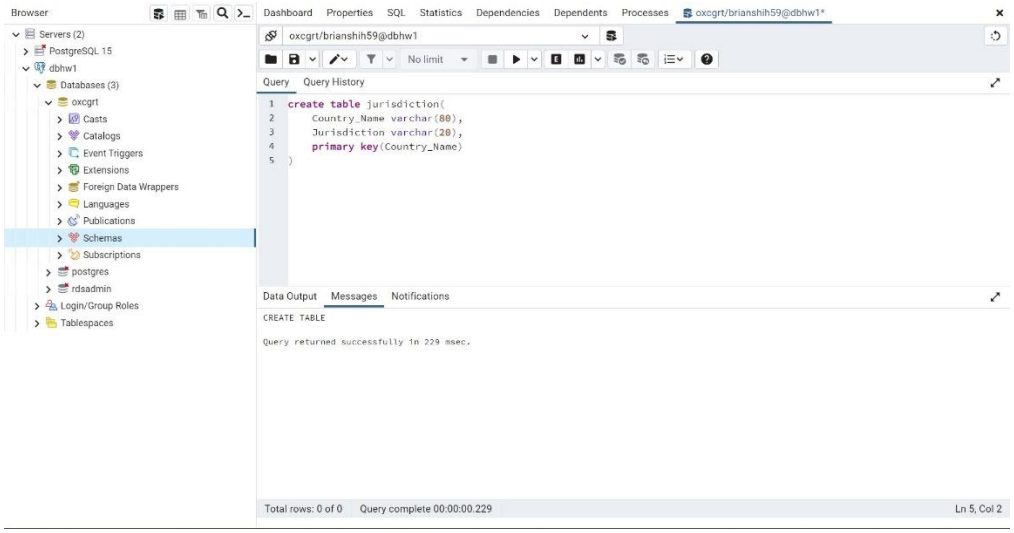
Create table “continent”



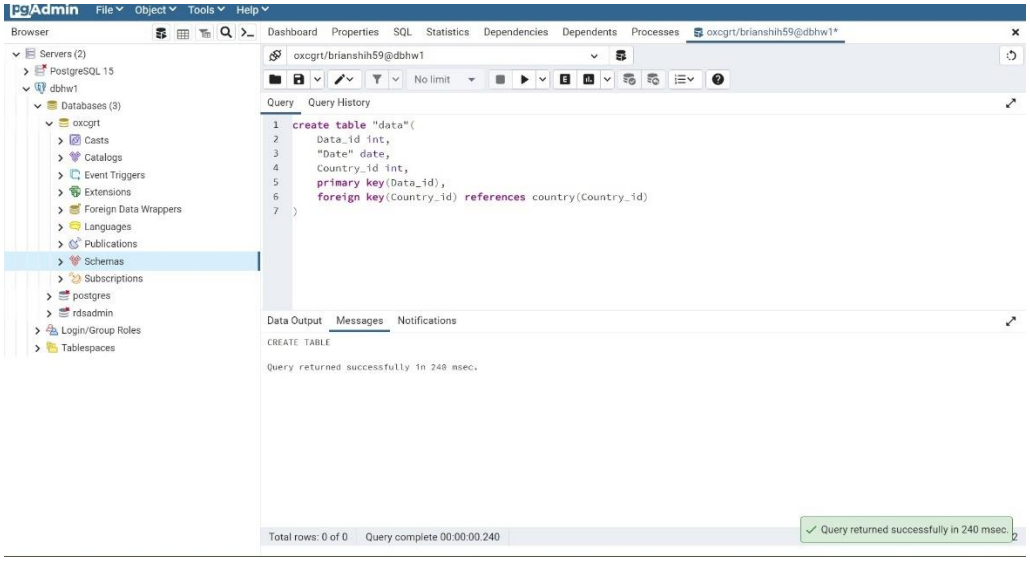
Create table “country_continent”



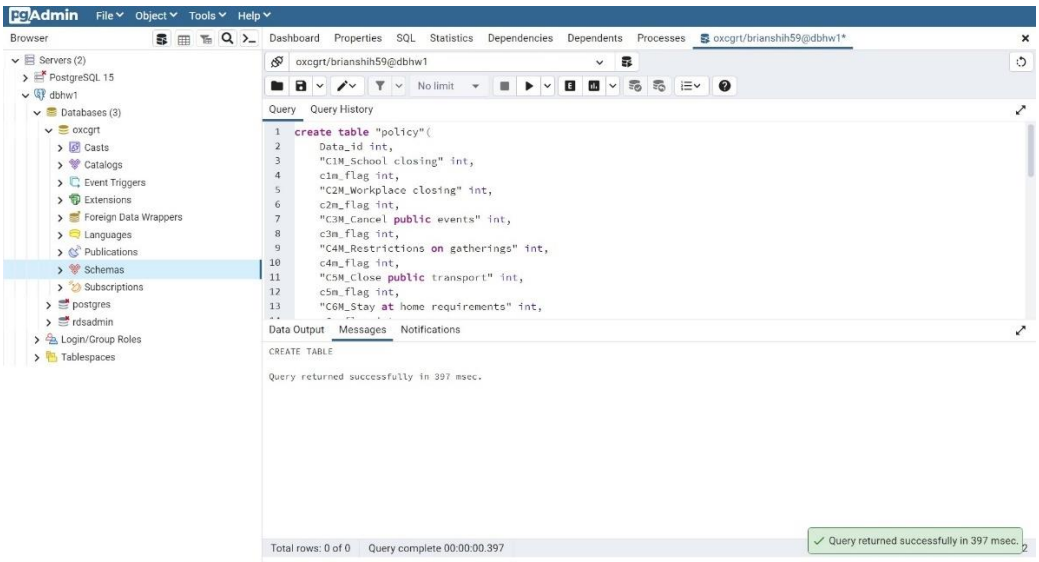
Create table “jurisdiction”



Create table “data”

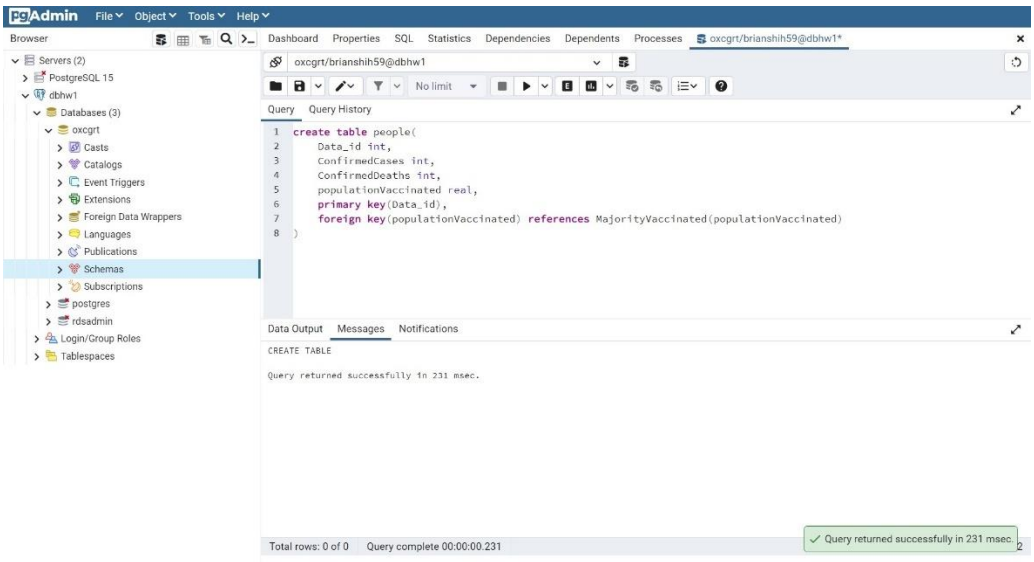


Create table “policy”

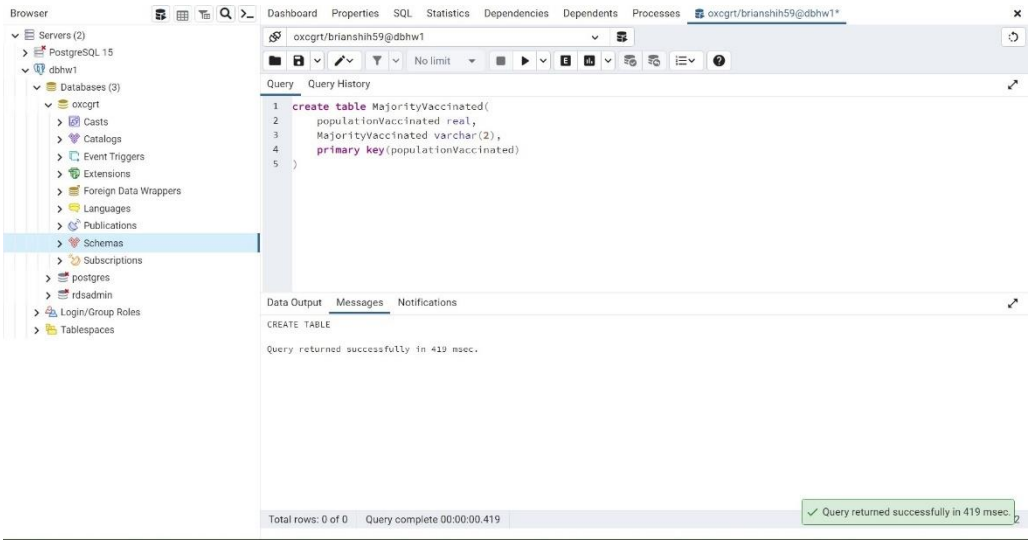


```
    c6m_flag int,
    "C7M_Restrictions on internal movement" int,
    c7m_flag int,
    "C8EV_International travel controls" int,
    "E1_Income support" int,
    e1_flag int,
    "E2_Debt/contract relief" int,
    "E3_Fiscal measures" real,
    "E4_International support" double precision,
    "H1_Public information campaigns" int,
    h1_flag int,
    "H2_Testing policy" int,
    "H3_Contact tracing" int,
    "H4_Emergency investment in healthcare" real,
    "H5_Investment in vaccines" real,
    "H6M_Facial Coverings" int,
    h6m_flag int,
    "H7_Vaccination policy" int,
    h7_flag int,
    "H8M_Protection of elderly people" int,
    h8m_flag int,
    "V1_Vaccine Prioritisation (summary)" int,
    "V2A_Vaccine Availability (summary)" int,
    "V2B_Vaccine age eligibility/availability age floor (general)" varchar(20),
    "V2C_Vaccine age eligibility/availability age floor (at risk)" varchar(20),
    "V2D_Medically/ clinically vulnerable (Non-elderly)" int,
    v2e_education int,
    "V2F_Frontline workers  (non healthcare)" int,
    "V2G_Frontline workers  (healthcare)" int,
    "V3_Vaccine Financial Support (summary)" int,
    "V4_Mandatory Vaccination (summary)" int,
    primary key(Data_id)
)
```

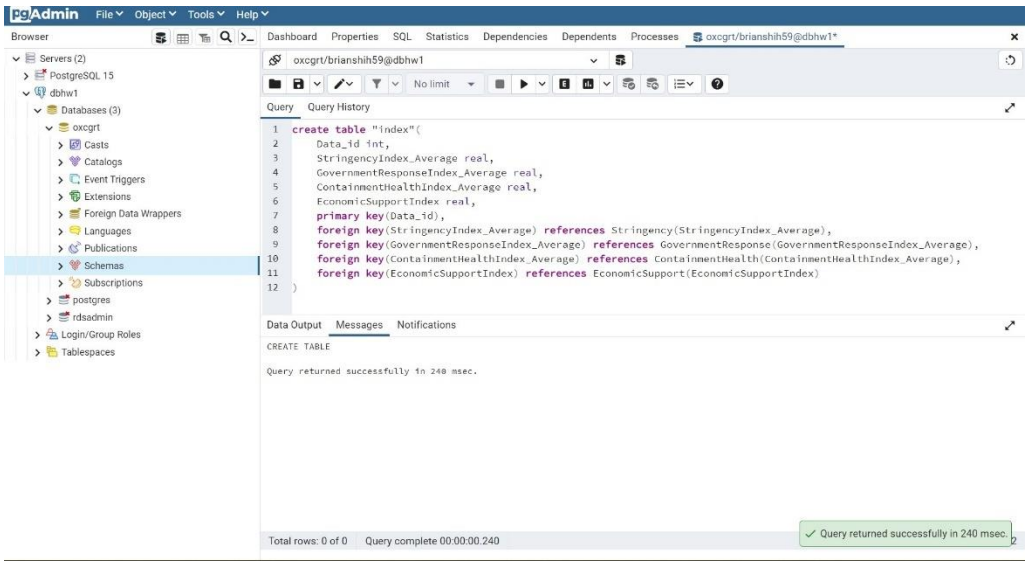
Create table “people”



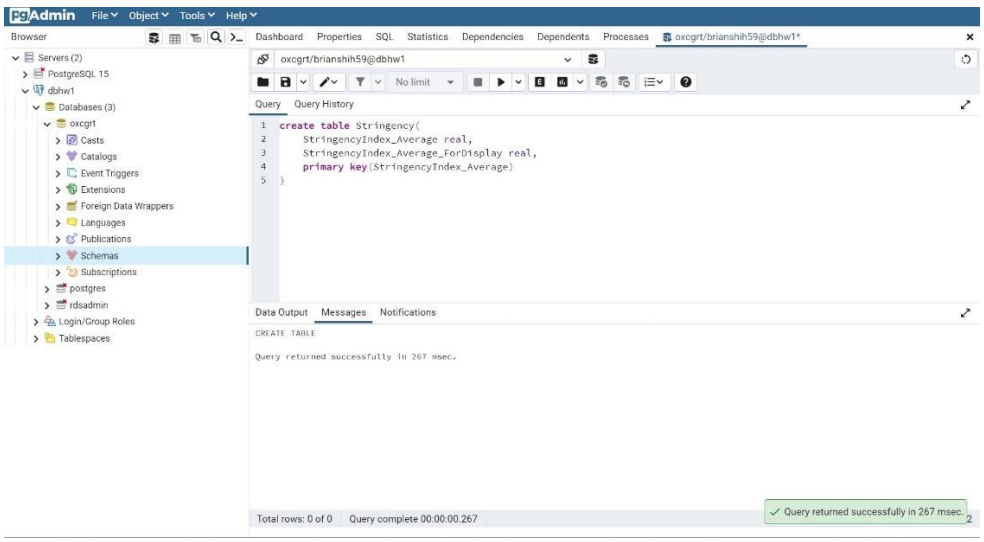
Create table “majorityVaccinated”



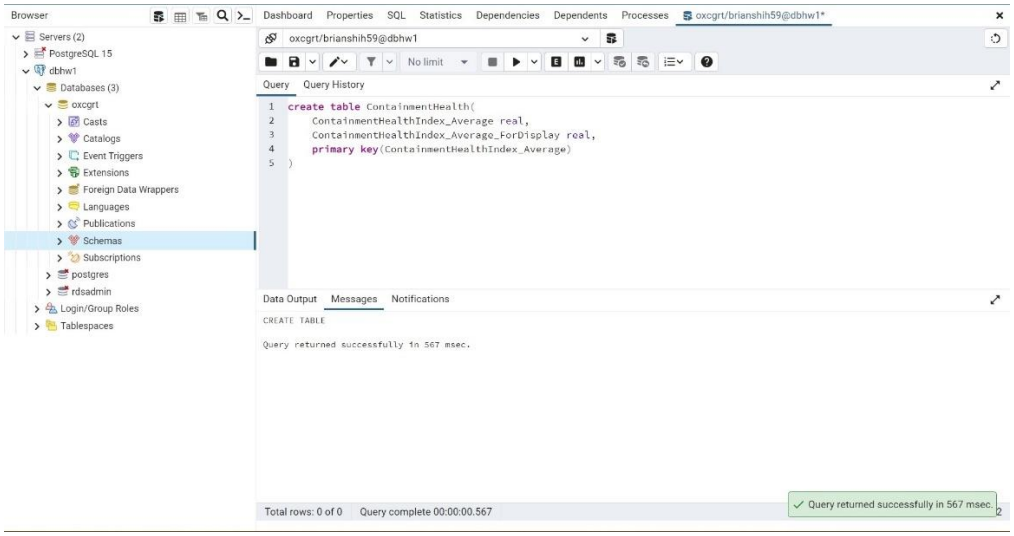
Create table “index”



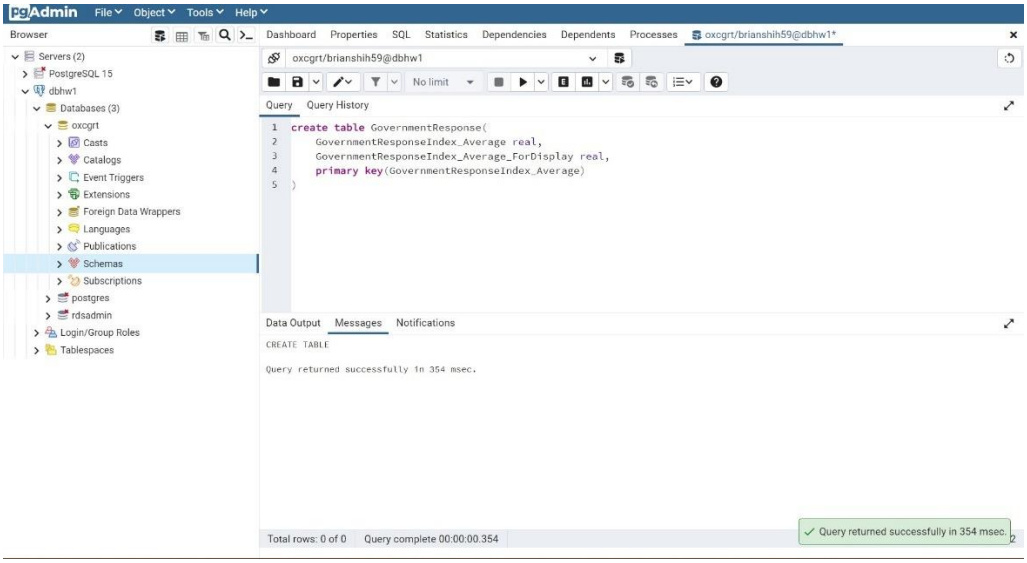
Create table “stringency”



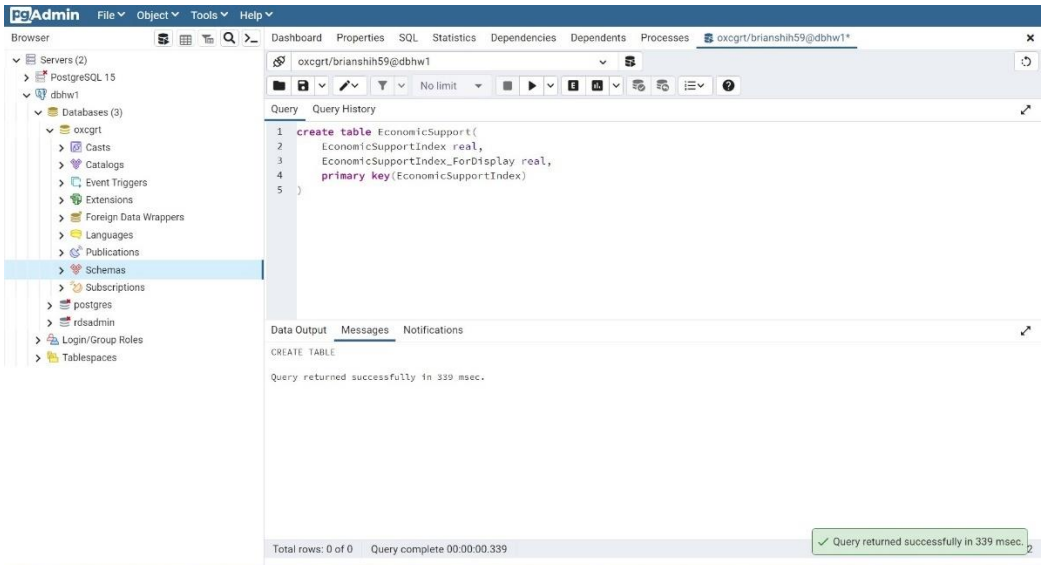
Create table “containmentHealth”



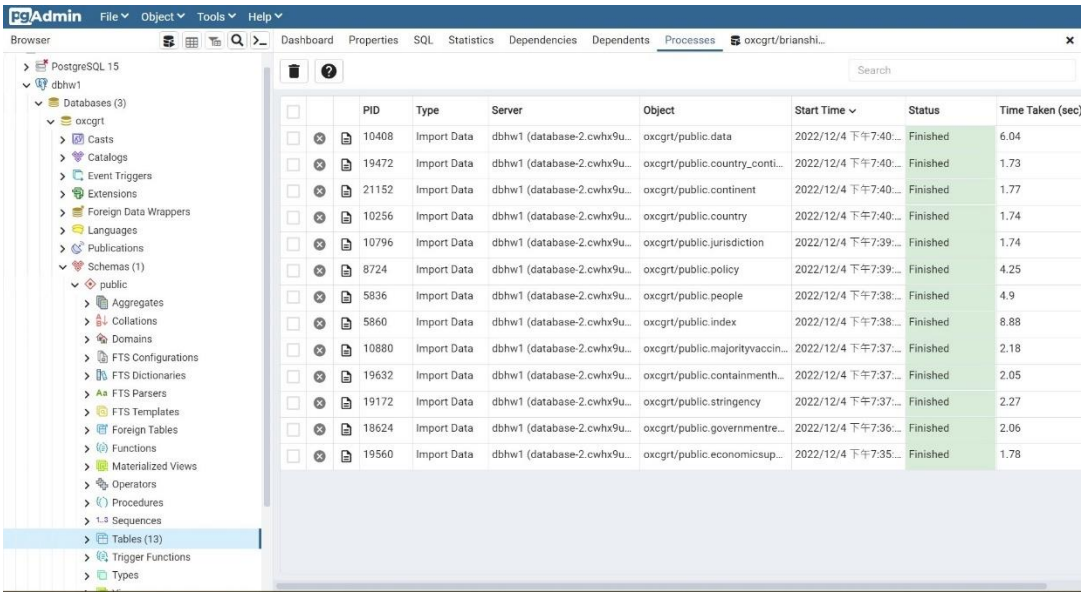
Create table “governmentResponse”



Create table “economicSupport”



Import data



4. Normal form

Table (country, continent, country_continent, jurisdiction, policy, data, people, index, majorityVaccinated) satisfies 1. No repeating groups 2. No partial dependency 3. No transitive dependency 4. the left-hand side of every functional dependency is a candidate key. So, they are in BCNF.

Table (stringency, governmentResponse, containmentHealth, economicSupport) satisfies 1. No repeating groups 2. No partial dependency 3. No transitive dependency. So, they are in 3NF.

5. functional dependency

country:
{country_id} -> {country_name},
{country_id} -> {country_code},
{country_id} -> {country_number}

continent:
{continent_id} -> {continent_name},
{continent_id} -> {continent_code}

country_continent:
{country_id, continent_id} -> {country_id, continent_id}

jurisdiction:
{country_name} -> {jurisdiction}

policy:
{data_id} -> {C1},
{data_id} -> {C2},
{data_id} -> {C3},
{data_id} -> {C4},
{data_id} -> {C5},
{data_id} -> {C6},
{data_id} -> {C7},
{data_id} -> {C8},
{data_id} -> {C1_flag},
{data_id} -> {C2_flag},
{data_id} -> {C3_flag},
{data_id} -> {C4_flag},
{data_id} -> {C5_flag},
{data_id} -> {C6_flag},
{data_id} -> {C7_flag},
{data_id} -> {E1},
{data_id} -> {E2},
{data_id} -> {E3},
{data_id} -> {E4},
{data_id} -> {E1_flag},
{data_id} -> {H1},
{data_id} -> {H2},
{data_id} -> {H3},
{data_id} -> {H4},
{data_id} -> {H5},
{data_id} -> {H6},
{data_id} -> {H7},
{data_id} -> {H8},
{data_id} -> {H1_flag},
{data_id} -> {H6_flag},
{data_id} -> {H7_flag},

{data_id} -> {H8_flag},
{data_id} -> {V1},
{data_id} -> {V2A},
{data_id} -> {V2B},
{data_id} -> {V2C},
{data_id} -> {V2D},
{data_id} -> {V2E},
{data_id} -> {V2F},
{data_id} -> {V2G},
{data_id} -> {V3},
{data_id} -> {V4}

data:
{data_id} -> {date},
{data_id} -> {country_id}

people:
{data_id} -> {confirmedCases},
{data_id} -> {confirmedDeaths},
{data_id} -> {populationVaccinated}

index:
{data_id} -> {stringencyIndex_average},
{data_id} -> {governmentResponseIndex_average},
{data_id} -> {containmentHealthIndex_average},
{data_id} -> {economicSupportIndex}

majorityVaccinated:
{populationVaccinated} -> {majorityVaccinated}

stringency:
{stringencyIndex_average} -> {stringencyIndex_average_ForDisplay},
{stringencyIndex_average_ForDisplay} -> {stringencyIndex_average}

governmentResponse:
{governmentResponseIndex_average} ->
{governmentResponseIndex_average_ForDisplay},
{governmentResponseIndex_average_ForDisplay} ->
{governmentResponseIndex_average}

containmentHealth:
{containmentHealthIndex_average} ->
{containmentHealthIndex_average_ForDisplay},
{containmentHealthIndex_average_ForDisplay} ->
{containmentHealthIndex_average}

economicSupport:
{economicSupportIndex} -> {economicSupportIndex_ForDisplay},
{economicSupportIndex_ForDisplay} -> {economicSupportIndex}

6. output results of 4a

	country_name character varying (80)	continent_name character varying (50)	Date date
1	Argentina, Argentine ...	South America	2020-06-01
2	Australia, Commonwe...	Oceania	2021-06-01
3	Bahamas, Commonw...	North America	2022-06-01
4	China, People's Repub...	Asia	2022-06-01
5	Cuba, Republic of	North America	2020-06-01
6	Fiji, Republic of the Fij...	Oceania	2020-06-01
7	Honduras, Republic of	North America	2020-06-01
8	Ireland	Europe	2020-06-01
9	Iraq, Republic of	Asia	2020-06-01
10	Italy, Italian Republic	Europe	2021-06-01
11	Libyan Arab Jamahiriya	Africa	2020-06-01
12	Malta, Republic of	Europe	2020-06-01
13	Mauritius, Republic of	Africa	2021-06-01
14	Nepal, State of	Asia	2020-06-01
15	Nepal, State of	Asia	2021-06-01
16	Peru, Republic of	South America	2022-06-01
17	El Salvador, Republic of	North America	2020-06-01
18	Trinidad and Tobago, ...	North America	2021-06-01
19	Ukraine	Europe	2022-06-01
20	Venezuela, Bolivarian ...	South America	2021-06-01

Total rows: 22 of 22 Query complete 00:00:09.499

	country_name character varying (80)	continent_name character varying (50)	Date date
3	Bahamas, Commonw...	North America	2022-06-01
4	China, People's Repub...	Asia	2022-06-01
5	Cuba, Republic of	North America	2020-06-01
6	Fiji, Republic of the Fij...	Oceania	2020-06-01
7	Honduras, Republic of	North America	2020-06-01
8	Ireland	Europe	2020-06-01
9	Iraq, Republic of	Asia	2020-06-01
10	Italy, Italian Republic	Europe	2021-06-01
11	Libyan Arab Jamahiriya	Africa	2020-06-01
12	Malta, Republic of	Europe	2020-06-01
13	Mauritius, Republic of	Africa	2021-06-01
14	Nepal, State of	Asia	2020-06-01
15	Nepal, State of	Asia	2021-06-01
16	Peru, Republic of	South America	2022-06-01
17	El Salvador, Republic of	North America	2020-06-01
18	Trinidad and Tobago, ...	North America	2021-06-01
19	Ukraine	Europe	2022-06-01
20	Venezuela, Bolivarian ...	South America	2021-06-01
21	Vanuatu, Republic of	Oceania	2022-06-01
22	Zimbabwe, Republic of	Africa	2022-06-01

Total rows: 22 of 22 Query complete 00:00:09.499

7. output results of 4b

	country_name character varying (80)	continent_name character varying (50)	over_stringency_index double precision	Date date
1	Belarus, Republic of	Europe	194.46000480651855	2022-06-01
2	Bermuda	North America	80.09750080108643	2021-06-01
3	Barbados	North America	1101.7999572753906	2020-06-01
4	Brunei Darussalam	Asia	738.9199829101562	2020-06-01
5	Congo, Republic of the	Africa	713.0200042724609	2021-06-01
6	Dominica, Commonwealth of	North America	453.73999786376953	2022-06-01
7	Fiji, Republic of the Fiji Islan...	Oceania	985.1800384521484	2020-06-01
8	Gambia, Republic of the	Africa	1088.9199829101562	2020-06-01
9	Guyana, Co-operative Repub...	South America	38.08000040054321	2020-06-01
10	Guyana, Co-operative Repub...	South America	0.47932877177128885	2021-06-01
11	Kyrgyz Republic	Asia	505.5400085449219	2022-06-01
12	Kiribati, Republic of	Oceania	557.3400192260742	2022-06-01
13	Liechtenstein, Principality of	Europe	790.7199935913086	2020-06-01
14	Sierra Leone, Republic of	Africa	590.9399871826172	2022-06-01
15	San Marino, Republic of	Europe	330.5400085449219	2021-06-01
16	Suriname, Republic of	South America	1.1381678981635406	2022-06-01
17	Tajikistan, Republic of	Asia	453.73999786376953	2021-06-01
18	Tonga, Kingdom of	Oceania	661.0800170898438	2021-06-01

Total rows: 18 of 18 | Query complete 00:00:38.502

8. Database auto-update (from the data provider’s GitHub repo) strategy and implementation

我不會 QQ