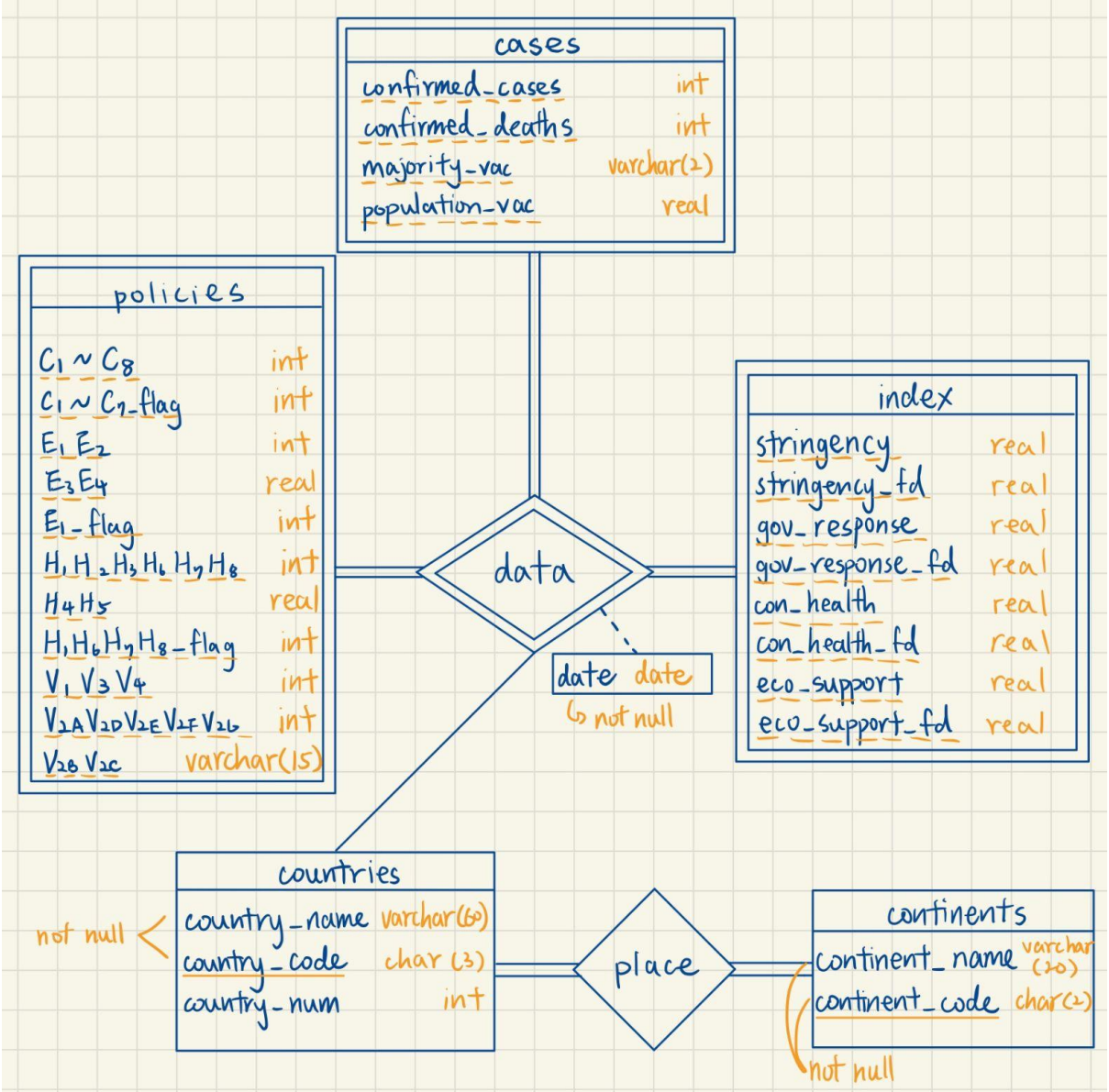
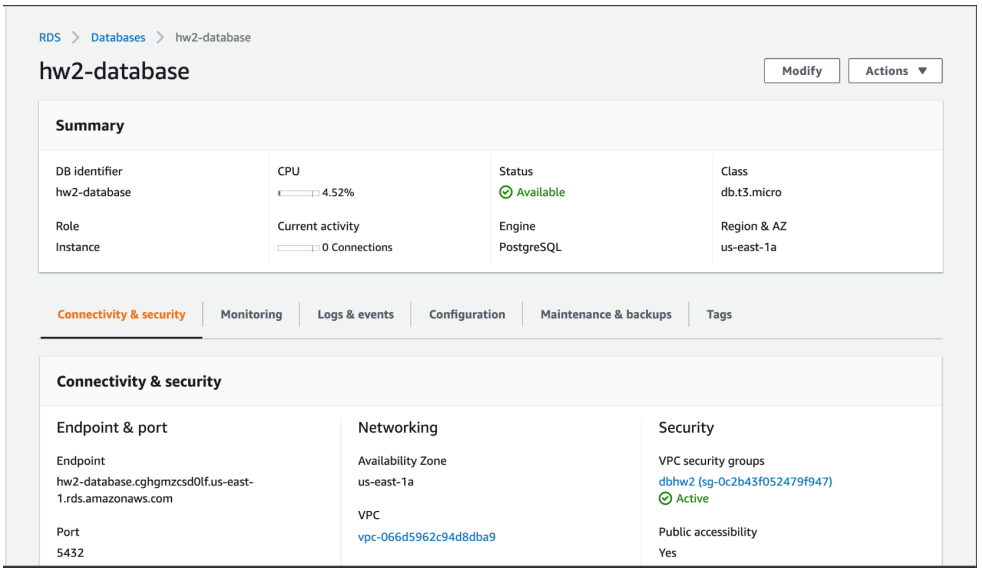
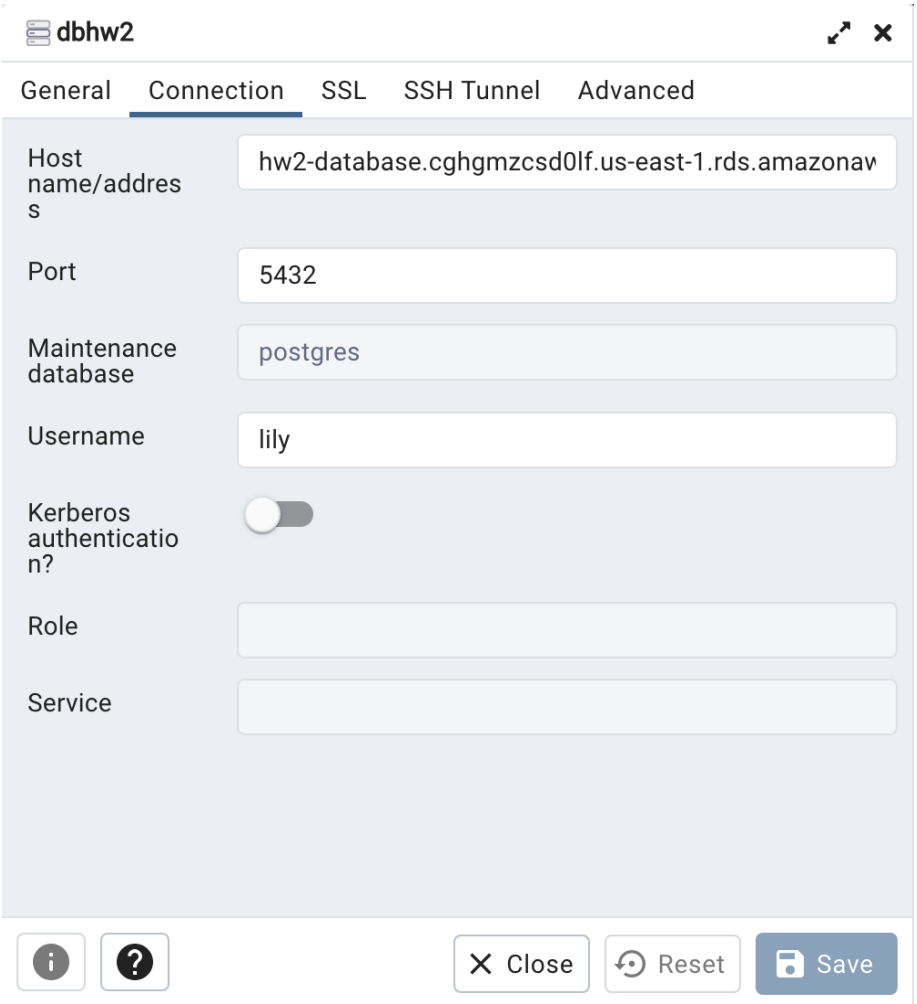
1. ER diagram with entity sets and relationship sets, with or without attributes. Add constraints if needed. (30pts)

   To avoid redundancy, I deleted 3 columns that were NULL in all rows (RegionName, RegionCode, M1_wildcard) and a column that contains all the same values (Jurisdiction).

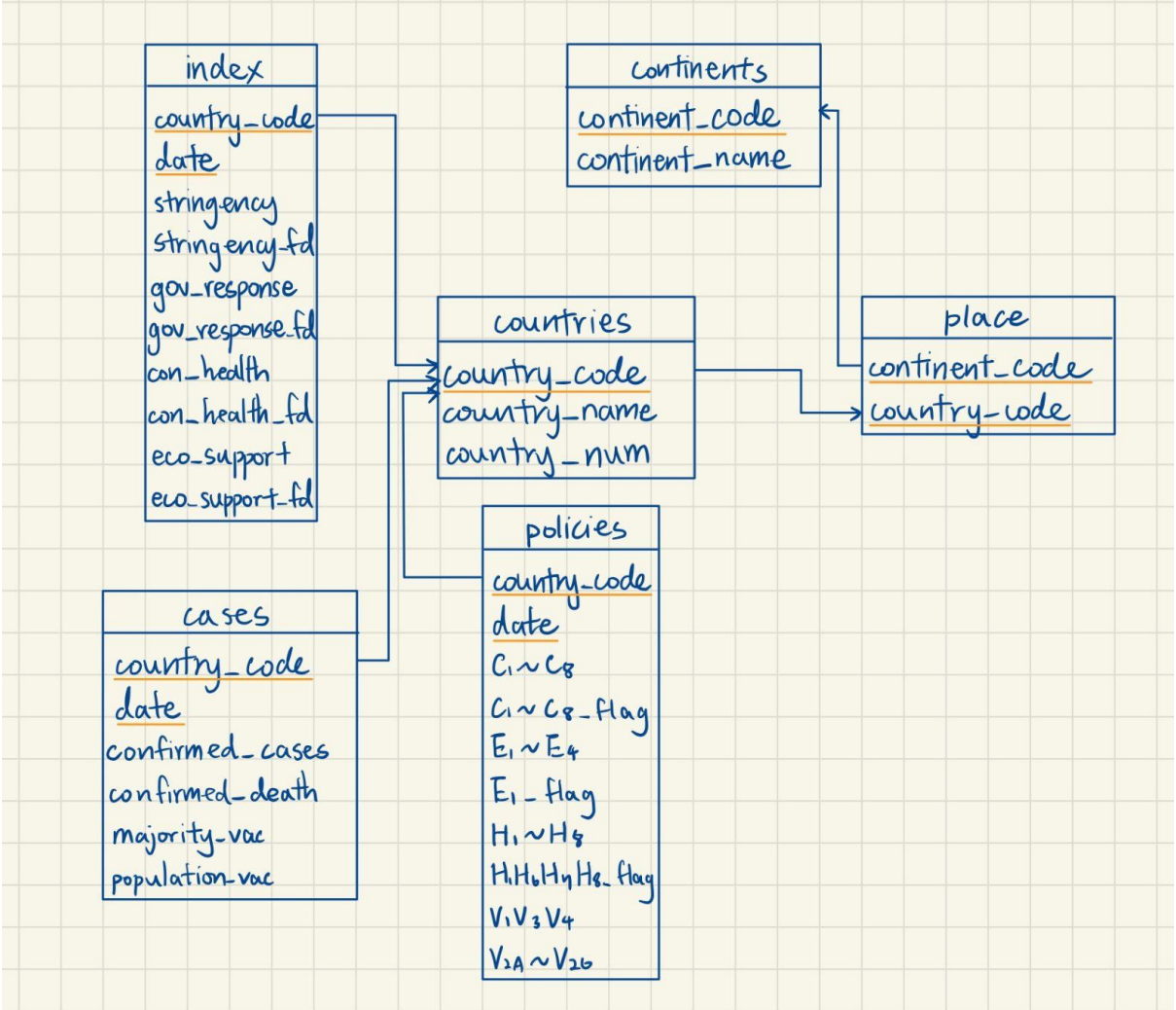


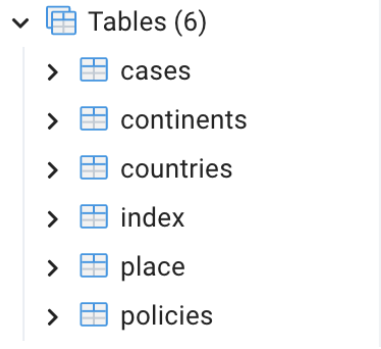
2. Provide print screens of the 1) AWS RDS lunch page, and 2) the way you connect to the AWS RDS (PostgreSQL console tool, pgAdmin, or other IDE's connection page, with the same IP or URL with your AWS RDS) (10pts)





3. Please provide the schema after decomposition, of each table, and a print screen to show that the tables have been created in your database on AWS RDS. (10+10pts)






```sql
create table cases(
    country_code char (3) not null
    date date not null,
    confirmed_cases int,
    confirmed_deaths int,
    majority_vac varchar(2),
    population_vac real,
    primary key (country_code, date),
    foreign key country_code references countries
);
```

```sql
create table continents(
    continent_code char(2) not null unique,
    continent_name varchar(20),
    primary key (continent_code)
);

create table place(
    continent_code char(2) not null,
    country_code char(3) not null unique,
    primary key (continent_code, country_code),
    foreign key (continent_code) references continents
);

create table countries(
    country_code char(3) not null,
    country_name varchar(60),
    country_num int,
    primary key (country_code),
    foreign key (country_code) references place (country_code)
);
```

```sql
create table policies(
    country_code char(3) not null,
    date date not null,
    c1 int, cl_flag int, c2 int, c2_flag int,
    c3 int, c3_flag int, c4 int, c4_flag int,
    c5 int, c5_flag int, c6 int, c6_flag int,
    c7 int, c7_flag int, c8 int,
    E1 int, El_flag int, E2 int, E3 real, E4 real,
    H1 int, H1_flag int, H2 int, H3 int,
    H4 real, H5 real, H6 int, H6_flag int,
    H7 int, H7_flag int, H8 int, H8_flag int,
    V1 int, V2a int, V2b varchar (15), V2c varchar (15),
    V2d int, V2e int, V2f int, V2g int, V3 int, V4 int,
    primary key (country_code, date),
    foreign key country_code references countries
);
```

```sql
create table index(
    country_code char (3) not null,
    date date not null,
    stringency real,
    stringency_fd real,
    gov_response real
    gov_response_fd real,
    con health real,
    con health_fd real,
    eco_support real,
    eco_support_fd real,
    primary key (country_code, date),
    foreign key country_code references countries
)
```

4. Clearly indicate the level of normal form, test the level of normal form for each table.
5. List the functional dependency of each table. (10pts)+(10pts)

Countries

PK: country_code
FD: (country_code) → (country_name)
(country_name) → (country_code)
(country_code) → (country_num)
(country_num) → (country_code)
(country_name) → (country_num)
(country_num) → (country_name)
Normal Form: 3NF
'country_code', 'country_name', and 'country_num' are all candidate keys and each attribute in β-α is contained in a candidate key for *countries*.

Continents

PK: continent_code
FD: (continent_code) → (contient_name)
(continent_name) → (continent_code)
Normal Form: 3NF
'continent_code', 'continent_name' are both candidate keys and each attribute in β-α is contained in a candidate key for *continents*.

Place

PK: country_code, continent_code
FD: (country_code, continent_code) → (country_code)
(country_code, continent_code) → (continent_code)
Normal Form: BCNF
'country_code, continent_code' is the PK and it can determine all other attributes.

Policies

PK: date, country_code
FD: (date, country_code) → (*all attributes in policies)
Normal Form: BCNF
'date' and 'country_code' is the PK and it can determine all other attributes.

Index

PK: date, country_code
FD: (date, country_code) → (*all attributes in index)
Normal Form: BCNF
'date' and 'country_code' is the PK and it can determine all other attributes.

Cases

PK: date, country_code
FD: (date, country_code) → (*all attributes in cases)
Normal Form: BCNF
'date' and 'country_code' is the PK and it can determine all other attributes.

6. The SQL statements (in .sql file) and output results of 4a (10pts)

	country_name character varying (60)	continent_name character varying (20)	date date
1	Libyan Arab Jamahiriya	Africa	2020-06-01
2	Nepal, State of	Asia	2020-06-01
3	Iraq, Republic of	Asia	2020-06-01
4	Malta, Republic of	Europe	2020-06-01
5	Ireland	Europe	2020-06-01
6	Cuba, Republic of	North America	2020-06-01
7	Honduras, Republic of	North America	2020-06-01
8	El Salvador, Republic of	North America	2020-06-01
9	Fiji, Republic of the Fiji Islands	Oceania	2020-06-01
10	Argentina, Argentine Republic	South America	2020-06-01
11	Mauritius, Republic of	Africa	2021-06-01
12	Nepal, State of	Asia	2021-06-01
13	Italy	Europe	2021-06-01
14	Trinidad and Tobago, Republi…	North America	2021-06-01
15	Australia, Commonwealth of	Oceania	2021-06-01
16	Venezuela, Bolivarian Republi…	South America	2021-06-01
17	Zimbabwe, Republic of	Africa	2022-06-01
18	China, People's Republic of	Asia	2022-06-01
19	Ukraine	Europe	2022-06-01
20	Bahamas, Commonwealth of…	North America	2022-06-01
21	Vanuatu, Republic of	Oceania	2022-06-01
22	Peru, Republic of	South America	2022-06-01

7. The SQL statements (in .sql file) and output results of 4b (10pts)

	country_name character varying (60)	continent_name character varying (20)	max_overstr double precision	date date
1	Lesotho, Kingdom of	Africa	31.020000457763672	2020-06-01
2	Bhutan, Kingdom of	Asia	2.471652596683825	2020-06-01
3	Monaco, Principality of	Europe	0.7243831950106019	2020-06-01
4	Dominica, Commonwealth of	North America	4.513750076293945	2020-06-01
5	Vanuatu, Republic of	Oceania	66.66999816894531	2020-06-01
6	Suriname, Republic of	South America	4.253593683242798	2020-06-01
7	Mauritius, Republic of	Africa	0.057861685092361614	2021-06-01
8	Macao, Special Administrative Region of China	Asia	0.4539215611476524	2021-06-01
9	Faroe Islands	Europe	0.05473059825644131	2021-06-01
10	Greenland	North America	1.2815589759739634	2021-06-01
11	Tonga, Kingdom of	Oceania	47.220001220703125	2021-06-01
12	Suriname, Republic of	South America	0.005624963248767581	2021-06-01
13	Liberia, Republic of	Africa	0.005683215983352048	2022-06-01
14	Macao, Special Administrative Region of China	Asia	0.3904819258724351	2022-06-01
15	Monaco, Principality of	Europe	0.0014435951071366713	2022-06-01
16	Dominica, Commonwealth of	North America	0.002284968968373668	2022-06-01
17	Kiribati, Republic of	Oceania	0.012850226395510334	2022-06-01
18	Guyana, Co-operative Republic of	South America	0.00040003448374174535	2022-06-01