hw1

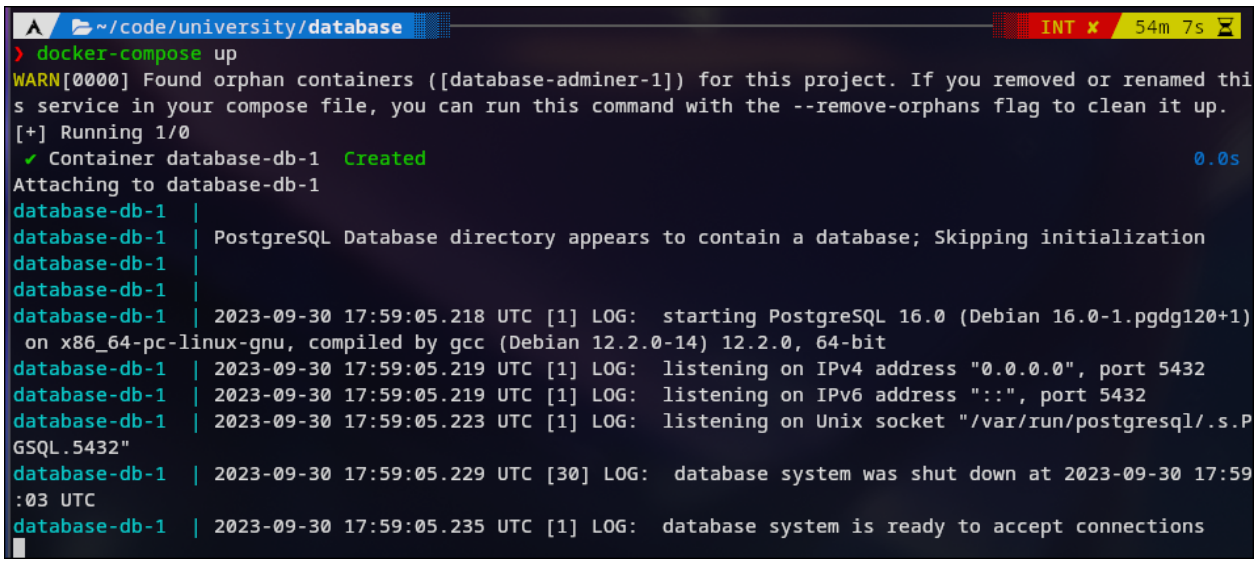
1. postgres

1. install

```
# Use postgres/example user/password credentials
version: '3.1'

services:

  db:
    image: postgres
    restart: always
    environment:
      POSTGRES_PASSWORD: example
```



2. CREATE USER

```
postgres=# create user dio
postgres-# ;
CREATE ROLE
```

3. CREATE DATABASE

```
postgres=# create database testdatabase;
CREATE DATABASE
```

4. CREATE TABLE

```
postgres=# create table test_table(day int);
CREATE TABLE
```

5. SHOW DATABASES

```
postgres=# \l
                                                List of databases
    Name     |  Owner   | Encoding | Locale Provider |  Collate   |   Ctype    | ICU Locale | ICU Rules |   Access privileges
-------------+----------+----------+-----------------+------------+------------+------------+-----------+-----------------------
 dd          | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           |
 postgres    | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           |
 template0   | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           | =c/postgres          +
             |          |          |                 |            |            |            |           | postgres=CTc/postgres
 template1   | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           | =c/postgres          +
             |          |          |                 |            |            |            |           | postgres=CTc/postgres
 test        | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           |
 testdatabase | postgres | UTF8     | libc            | en_US.utf8 | en_US.utf8 |            |           |
(6 rows)
```

6. SHOW TABLES

```
postgres=# \dt
            List of relations
 Schema |     Name     | Type  |  Owner
--------+--------------+-------+----------
 public | dd           | table | postgres
 public | test         | table | postgres
 public | test_table   | table | postgres
 public | testdatabase | table | postgres
(4 rows)
```

7. SHOW COLUMNS

```
postgres=# \d test_table
             Table "public.test_table"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 day    | integer |           |          |
```

8. DESCRIBE

```
postgres=# \d test_table;
             Table "public.test_table"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 day    | integer |           |          |
```

2. main characteristics of database approach

1. DBMS儲存特定資料庫的描述，稱爲meta-data
2. meta-data允許DBMS在不同資料庫軟體裏都能動
3. 允許使用者並行檢索和更新資料庫。
4. 允許資料與程式保持獨立，讓使用者可以更改資料已結構而不用更改DBMS
5. DBMS確保每個transaction 正確執行或中止
6. 復原系統把每個已完成的Transaction的作用記錄在資料庫中
7. OPTP允需每秒執行很多併發transactions
8. 支援多種資料視圖
9. 資料抽象，讓使用者不需要接觸實際資料儲存細節
10. 資料庫可以根據使用者權限控制對資料的存取

3. define terms

1. data model:
   描述資料庫結構、操作這些結構的操作以及資料庫應遵守的某些約束的一組概念，提供實現資料抽象的手段。提供與許多使用者使用資料的方式接近的概念。
2. database schema：
   資料庫的敘述，包含資料結構種類與限制

4.

1. three schema architecture:

1. Internal schema
   - 描述物理儲存架構和存取路徑
2. Conceptual schema
   - 敘述使用者定義的資料架構與資料限制
3. External schemas
   - 通常爲data model
   - 敘述部分使用者有興趣的資料，隱藏其他資料

2.

- logical data independence: change the conceptual schema without having to change the external schemas
- physical data independence: change the internal schema without having to change the conceptual schema.

5.

	Entity 1	Cardinality Ratio	Entity 2
1.	Student	one-to-many	Book
2.	Student	many-to-one	Advisor
3.	ClassRoom	many-to-many	Wall
4.	Student	many-to-many	Course
5.	Car	one-to-one	Engine

1. a student have many book, a book have one owner.
2. a student have one advisor, a advisor have many student.
3. a classroom have many wall, a wall can be two classroom wall.
4. a student have many course, a course have many student.
5. a car have one engine, a engine have only car.

6.

a.

student(Student ID No. , name, address, ID No. ,cellphone, class, Department/Graduate Institute, suspension)
Suspension(No. , student ID No. , Term of suspension, signature, signed by parent, date of resumption, date of application, application)

b.