

Task Databases Part 1

The system on which the task was performed

- Ubuntu 18

```
root@docker:~# cat /etc/os-release
NAME="Ubuntu"
VERSION="18.04.5 LTS (Bionic Beaver)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 18.04.5 LTS"
VERSION_ID="18.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=bionic
UBUNTU_CODENAME=bionic
```

- Database designed in Mysql WorkBench and after was exported
- into sql script. Database name – Hospital, consist 7 tables:

```
mysql> show tables;
+-----+
| Tables_in_hospital |
+-----+
| cabinets            |
| department          |
| diagnos              |
| doctors              |
| patients             |
| scedule              |
| scedule_date         |
+-----+
7 rows in set (0.00 sec)

mysql> 
```

DDL requests – Data Definition Language

- Create table:

```
mysql> show tables;
+-----+
| Tables_in_hospital |
+-----+
| cabinets            |
| department          |
| diagnos             |
| doctors             |
| patients            |
| scedule             |
| scedule_date        |
+-----+
7 rows in set (0.00 sec)

mysql> create table vaccine ( vaccine_id int not null auto_increment, vaccine_name varchar(45), vaccine_expiration_date date, primary key (vaccine_id) );
Query OK, 0 rows affected (0.11 sec)

mysql> show tables;
+-----+
| Tables_in_hospital |
+-----+
| cabinets            |
| department          |
| diagnos             |
| doctors             |
| patients            |
| scedule             |
| scedule_date        |
| vaccine             |
+-----+
8 rows in set (0.00 sec)

mysql> desc vaccine;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| vaccine_id | int(11)   | NO   | PRI | NULL    | auto_increment |
| vaccine_name | varchar(45) | YES  |     | NULL    |              |
| vaccine_expiration_date | date      | YES  |     | NULL    |              |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

- Alter table:

```
mysql> alter table vaccine  
-> add vacine amount int;  
Query OK, 0 rows affected (0.13 sec)  
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> select * from vaccine;
```

vaccine_id	vaccine_name	vaccine_expiration_date	vacine_amount
1	Moderna	2023-01-25	NULL
2	Phiser	2022-12-25	NULL

2 rows in set (0.00 sec)

```
mysql> alter table vaccine drop column vacine_amount;
```

```
Query OK, 0 rows affected (0.15 sec)
```

```
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql>
```

```
mysql>
```

```
mysql> select * from vaccine;
```

vaccine_id	vaccine_name	vaccine_expiration_date
1	Moderna	2023-01-25
2	Phiser	2022-12-25

```
2 rows in set (0.00 sec)
```

- Rename table:



```
mysql> rename table vaccine to vacine;  
Query OK, 0 rows affected (0.06 sec)  
  
mysql> select * from vaccine;  
ERROR 1146 (42S02): Table 'hospital.vaccine' doesn't exist  
mysql> select * from vacine;  
+-----+-----+-----+  
| vaccine_id | vaccine_name | vaccine_expiration_date |  
+-----+-----+-----+  
|          1 | Moderna     | 2023-01-25              |  
|          2 | Phiser      | 2022-12-25              |  
+-----+-----+-----+  
2 rows in set (0.00 sec)
```

- Truncate and drop table:

```
mysql> select * from vacine;
+-----+-----+-----+
| vaccine_id | vaccine_name | vaccine_expiration_date |
+-----+-----+-----+
|          1 | Moderna     | 2023-01-25              |
|          2 | Phiser      | 2022-12-25              |
+-----+-----+-----+
2 rows in set (0.00 sec)

mysql>
mysql>
mysql>
mysql> truncate table vacine;
Query OK, 0 rows affected (0.04 sec)

mysql> select * from vacine;
Empty set (0.00 sec)

mysql> drop table vacine;
Query OK, 0 rows affected (0.02 sec)

mysql> show tables;
+-----+
| Tables_in_hospital |
+-----+
| cabinets            |
| department          |
| diagnos             |
| doctors             |
| patients            |
| scedule             |
| scedule_date        |
+-----+
7 rows in set (0.00 sec)
```


DQL requests – data query language

- Select:

```
mysql> show tables;
+-----+
| Tables_in_hospital |
+-----+
| cabinets            |
| department          |
| diagnos             |
| doctors             |
| patients            |
| scedule             |
| scedule_date        |
+-----+
7 rows in set (0.00 sec)

mysql> select * from scedule_date;
+-----+-----+-----+
| scedule_date_id | scedule_date        | scedule_id |
+-----+-----+-----+
| 1 | 2022-10-25 09:00:00.000000 | 1 |
| 3 | 2022-10-25 11:00:00.000000 | 3 |
| 4 | 2022-10-25 12:00:00.000000 | 4 |
+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> select * from scedule;
+-----+-----+-----+-----+
| scedule_id | cabinet_num | doctor_name | patient_name |
+-----+-----+-----+-----+
| 1 | 10 | Ликар1 | Пациент1 |
| 3 | 11 | Ликар3 | Пациент3 |
| 4 | 20 | Ликар4 | Пациент4 |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> select * from scedule_date left outer join scedule using (scedule_id);
+-----+-----+-----+-----+-----+-----+
| scedule_id | scedule_date_id | scedule_date        | cabinet_num | doctor_name | patient_name |
+-----+-----+-----+-----+-----+-----+
| 1 | 1 | 2022-10-25 09:00:00.000000 | 10 | Ликар1 | Пациент1 |
| 3 | 3 | 2022-10-25 11:00:00.000000 | 11 | Ликар3 | Пациент3 |
| 4 | 4 | 2022-10-25 12:00:00.000000 | 20 | Ликар4 | Пациент4 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> select * from scedule_date;
```

scedule_date_id	scedule_date	scedule_id
1	2022-10-25 09:00:00.000000	1
3	2022-10-25 11:00:00.000000	3
4	2022-10-25 12:00:00.000000	4

```
3 rows in set (0.01 sec)
```

```
mysql> 
```

- Group by and having:

```
mysql> select * from medicines;
+-----+-----+-----+-----+-----+-----+
| medicine_id | medicines_name | medicine_amount | medicine_price | medicine_manufacturer | medicine_dose |
+-----+-----+-----+-----+-----+-----+
| 2 | Ібупрофен | 100 | 25 | Дарниця | 10 |
| 3 | Преднізолон | 100 | 20 | Дарниця | 5.5 |
| 4 | Лідоканін | 100 | 15 | Фармак | 10 |
| 9 | Ібупрофен | 50 | 30 | Дарниця | 15 |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> select medicines_name,medicine_manufacturer, count(*) as ManufacturerCount from medicines group by medicines_name,medicine_manufacturer
+-----+-----+-----+
| medicines_name | medicine_manufacturer | ManufacturerCount |
+-----+-----+-----+
| Ібупрофен | Дарниця | 2 |
| Лідоканін | Фармак | 1 |
| Преднізолон | Дарниця | 1 |
+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> select medicine_manufacturer, count(*) as ManufacturerCount from medicines group by medicine_manufacturer
+-----+-----+
| medicine_manufacturer | ManufacturerCount |
+-----+-----+
| Дарниця | 3 |
| Фармак | 1 |
+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> select medicine_manufacturer, count(*) as ManufacturerCount from medicines group by medicine_manufacturer having count(*)>1;
+-----+-----+
| medicine_manufacturer | ManufacturerCount |
+-----+-----+
| Дарниця | 3 |
+-----+-----+
1 row in set (0.00 sec)
```

- Order by:

- ```
mysql> select * from medicines;
```

| medicine_id | medicines_name | medicine_amount | medicine_price |
|-------------|----------------|-----------------|----------------|
| 2           | Ібупрофен      | 100             | 25             |
| 3           | Преднізолон    | 100             | 20             |
| 4           | Лідокаїн       | 100             | 15             |

3 rows in set (0.00 sec)

```
mysql>
```

```
mysql>
```

```
mysql> select medicines_name,medicine_amount*medicine_price as total_medicine_price from medicines order by total_medicine_price;
```

| medicines_name | total_medicine_price |
|----------------|----------------------|
| Лідокаїн       | 1500                 |
| Преднізолон    | 2000                 |
| Ібупрофен      | 2500                 |

3 rows in set (0.00 sec)

# DML requests – Data Manipulation Languages

- Insert, update and delete:

```
mysql> insert into doctors (doctor_name,doctor_descr) values ('Лікар6', 'Лікар-педіатр');
Query OK, 1 row affected (0.02 sec)
```

```
mysql> select * from doctors;
```

| doctor_id | doctor_name | doctor_descr                       |
|-----------|-------------|------------------------------------|
| 1         | Лікар1      | лікар-хірург                       |
| 2         | Лікар2      | Лікар-невропатолог                 |
| 3         | Лікар3      | Лікар-терапевт                     |
| 4         | Лікар4      | Лікар-рентгенолог                  |
| 5         | Лікар5      | Лікар з ультразвукової діагностики |
| 6         | Лікар6      | Лікар-педіатр                      |

```
6 rows in set (0.00 sec)
```

```
mysql> update doctors set doctor_descr='Лікар-ревматолог' where doctor_id=6;
```

```
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> select * from doctors;
```

| doctor_id | doctor_name | doctor_descr                       |
|-----------|-------------|------------------------------------|
| 1         | Лікар1      | лікар-хірург                       |
| 2         | Лікар2      | Лікар-невропатолог                 |
| 3         | Лікар3      | Лікар-терапевт                     |
| 4         | Лікар4      | Лікар-рентгенолог                  |
| 5         | Лікар5      | Лікар з ультразвукової діагностики |
| 6         | Лікар6      | Лікар-ревматолог                   |

```
6 rows in set (0.00 sec)
```

```
mysql> delete from doctors where doctor_id=6;
```

```
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from doctors;
```

| doctor_id | doctor_name | doctor_descr                       |
|-----------|-------------|------------------------------------|
| 1         | Лікар1      | лікар-хірург                       |
| 2         | Лікар2      | Лікар-невропатолог                 |
| 3         | Лікар3      | Лікар-терапевт                     |
| 4         | Лікар4      | Лікар-рентгенолог                  |
| 5         | Лікар5      | Лікар з ультразвукової діагностики |

```
5 rows in set (0.00 sec)
```

```
mysql> insert into medicines (medicines_name,medicine_amount) value ('Новокаїн',100);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into medicines (medicines_name,medicine_amount) value ('Панадол',200);
Query OK, 1 row affected (0.02 sec)
```

```
mysql> select * from medicines;
```

| medicine_id | medicines_name | medicine_amount |
|-------------|----------------|-----------------|
| 1           | Аспірин        | 100             |
| 2           | Ібупрофен      | 100             |
| 3           | Преднізолон    | 100             |
| 4           | Новокаїн       | 100             |
| 5           | Панадол        | 200             |

```
5 rows in set (0.00 sec)
```

```
mysql> update medicines set medicine_amount=500 where medicine_id=5;
```

```
Query OK, 1 row affected (0.02 sec)
```

```
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> update medicines set medicines_name='Лідокаїн' where medicine_id=4;
```

```
Query OK, 1 row affected (0.01 sec)
```

```
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> select * from medicines;
```

| medicine_id | medicines_name | medicine_amount |
|-------------|----------------|-----------------|
| 1           | Аспірин        | 100             |
| 2           | Ібупрофен      | 100             |
| 3           | Преднізолон    | 100             |
| 4           | Лідокаїн       | 100             |
| 5           | Панадол        | 500             |

```
5 rows in set (0.00 sec)
```

```
mysql> delete from medicines where medicine_id=5;
```

```
Query OK, 1 row affected (0.00 sec)
```

```
mysql> delete from medicines where medicine_id=1;
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from medicines;
```

| medicine_id | medicines_name | medicine_amount |
|-------------|----------------|-----------------|
| 2           | Ібупрофен      | 100             |
| 3           | Преднізолон    | 100             |
| 4           | Лідокаїн       | 100             |

```
3 rows in set (0.00 sec)
```



# DCL requests – Data Control Languages

- Create new user doctor2, grant privileges (select, insert,update) and after revoke update and select privileges:

```
mysql> create user doctor2@localhost identified by 'Password123';
Query OK, 0 rows affected (0.00 sec)

mysql> grant select,insert,update on hospital.* to doctor2@localhost;
Query OK, 0 rows affected (0.00 sec)

mysql> show grants for doctor2@localhost;
+-----+
| Grants for doctor2@localhost |
+-----+
| GRANT USAGE ON *.* TO 'doctor2'@'localhost' |
| GRANT SELECT, INSERT, UPDATE ON `hospital`.* TO 'doctor2'@'localhost' |
+-----+
2 rows in set (0.01 sec)

mysql> revoke update on hospital.* from doctor2@localhost;
Query OK, 0 rows affected (0.00 sec)

mysql> show grants for doctor2@localhost;
+-----+
| Grants for doctor2@localhost |
+-----+
| GRANT USAGE ON *.* TO 'doctor2'@'localhost' |
| GRANT SELECT, INSERT ON `hospital`.* TO 'doctor2'@'localhost' |
+-----+
2 rows in set (0.00 sec)
```

```
mysql> revoke select on hospital.* from doctor2@localhost;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> show grants for doctor2@localhost;
```

```
+-----+
| Grants for doctor2@localhost |
+-----+
| GRANT USAGE ON *.* TO 'doctor2'@'localhost' |
| GRANT INSERT ON `hospital`.* TO 'doctor2'@'localhost' |
+-----+
2 rows in set (0.00 sec)
```

- Check new user select request without privileges for select:

```
mysql> select current_user();
+-----+
| current_user() |
+-----+
| doctor2@localhost |
+-----+
1 row in set (0.00 sec)

mysql> select * from doctors;
ERROR 1142 (42000): SELECT command denied to user 'doctor2'@'localhost' for table 'doctors'
mysql> insert into doctors (doctor_name,doctor_descr) values ('Лаборант2', 'Лаборант2');
Query OK, 1 row affected (0.01 sec)
```