Database Adminstration Project

Prepared By: Tamrat Kebede Gebresilasie

Natenael Tsega Hawaz

Aline Ishimwe

Munashe Tsangu

HOSPITAL MANAGEMENT SYSTEM

1.

Description of Database

The Hospital need to store the information about patients and employee.

The purpose of this hospital database is to create a system that can store and manage information about the hospital's patients, physicians, departments, procedures, medication, appointments and other related entities. This system will help the hospital to improve its efficiency, quality and safety by providing easy access and retrieval of data as well as supporting various analysis and reporting functions. This system will also help the hospital to comply with the legal and ethical standards of data protection and privacy.

The system will have a user interface that allows different users, such as patients, physicians, nurses, administrators, etc., to interact with the database. Depending on their role and access level, the users will be able to perform different tasks, such as creating, updating, deleting, or viewing data

when a new patient visits the hospital, they will create a new profile in the system by entering their personal information, such as name, address, phone number, insurance ID, etc. The system will assign them a unique SSN and store their data in the patient table. The patient will also choose a primary care physician from the list of available physicians in the system and store their ID in the column of the patient table.

When the patient needs to make an appointment with their PCP or another physician, they will use the system to select a date and time slot that is available for both the patient and the physician. The system will then create a new record in the appointment table that stores the SSN of the patient, the employee ID of the physician, and the date and time of the appointment.

When the patient arrives at the hospital for their appointment, they will check in with the receptionist who will verify their identity and confirm their appointment details. The receptionist will also update the status column of the appointment table to indicate that the patient has arrived.

The physician will then see the patient and perform a diagnosis and treatment. The physician will use the system to record their findings and recommendations in the prescribes table, which stores the SSN of the patient, the employee ID of the physician, the code of the medication or procedure prescribed, and the date and time of the prescription.

2)

a) Tables

1. Department, Employee Department, Employee, Employee Details, Employee Address Mapping

2. Role

3. Patient Billing, Patient Register, Patient Diseases, Patient Appointment, Patient Attendant, Feedback, Patient Lab Report

4.Patient Insurance, Patient, Patient Address Mapping

5.Diseases, Address, Address Type, Lab Test

b) Description of Tables

   a.   Employee Department: it gives information about which department the employee is included.
   b.   Employee: gives details information about to use it in the hospital system.
   c.   Employee Details: gives personal details about the employees
   d.   Employee Address Mapping: has data about where the employee works
   e.   Role: stores information about roles of the employee
   f.   Patient Billing: is about the payments made by the patients for the services.
   g.   Patient Register: it is about the patients who has got registered
   h.   Patient: stores the personal information of the patients.
   i.   Patient Appointment: is about appointments of patients.
   j.   Patient Attendant: It has data about the patient has met with the employee or not.
   k.   Feedback: the outcomes after having meeting with the employee, feedbacks can be given by either employee or patients
   l.   Patient Lab Report: results from the laboratory
   m. Patient Insurance: information about the insurances
   n.   Patient disease: information about disease of each patient
   o.   Patient Address Mapping: it stores information about which department the patient is classified in.
   p.   Diseases: information of diseases.

q. Address Type: contain information about in which type employee or patient is classified
r. Lab Test: is an experiment which took place in the laboratory.
s. Department: has information about departments

c) Characteristics of database columns – primary key, foreign key, not null, unique

a) Patient insurance

Column Name	Datatype	Not Null	Unique	Primary KEY	Foreign
Patient_id	INT	X			X
Patientinsurance_id	INT			X	

b) EMPLOYEE

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
Employee_id	INT	X		X	
Created_by	INT	X			

c)Employee details

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
EmployeeDetails_id	INT	X		X	
FirstName	VARCHAR	X			
LastName	VARCHAR	X			
Role_id	INT				X
Employee_Employee_id	INT	X			X

D) Patient_Register

Column Name	Data Type	Not NULL	Unique	Primary Key	Foreign Key
IPatient_regester_id	INT	X		X	
Patietinsurance_id	INT				X
Patient_patient_id	INT	X			X

E)Patient

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key

	INT	X		X	
Patient_id	INT	X		X	
FirstName	VARCHAR	X			
LastName	VARCHAR	X			

F)Patient_billing

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign key
PatientBilling_id	INT	X		X	
PatientRegister_id	INT	X			X
TransactionDesc	VARCHAR	X			
PatientAddress	INT				X

G)Patient appointment

Column Name	Data type	Not Null	Unique	Primary Key	Foreign Key
Appointment Date	Datetime	X		X	
Employee_Employee_ID	Int	X			X
Patient_Patient_ID	Int	X			X
CreatedBY	Int	X			x

H) PatientAddressMapping

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
PatientAdress Mapping_ID	INT	X		X	
AddressType_ID	INT				X
Address_ID	INT				X
Patient_patient_ID	INT	X			X

I)Address

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
Address_ID	INT	X		X	
Address 1	Varchar	X			
City	Varchar	X			

J)Patient Attendance

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
Employee_employee_Id	INT	X			X
Patient_register_patient_register_ID	INT	X			X

K) Patient Disease

Column Name	Data Type	Not Null	Unique	Primary key	Foreign Key
Patient_register_patient_register_ID	INT				X
Disease_Disease_ID	INT				X

L) PatientLabReport

Column Name	Data Type	Not Null	Unique	Primary Key	Foreign Key
PatientLabReport_ID	INT			X	
LabTest_Labtest_ID	INT				X
Patient_register_patient_register_ID	INT				X

D) Brief description of foreign keys – which tables and which attributes of these tables

Many-to-Many Relationship

Employee and patient one employee could treat many patients and one patient can be treated by many employees. There will be intermediate table containing Employee_ID and Patient_ID as a foreign key.

One-to-Many Relationship

One insurance can be used by many patients and one patient can have one insurance.

One-To-One Relationship

One lab report corresponds to one patient and one patient could have only one specific lab report (specified time)

Part 2

1. Data base synchronization

A. We have created a schema named my_hospital from our model.
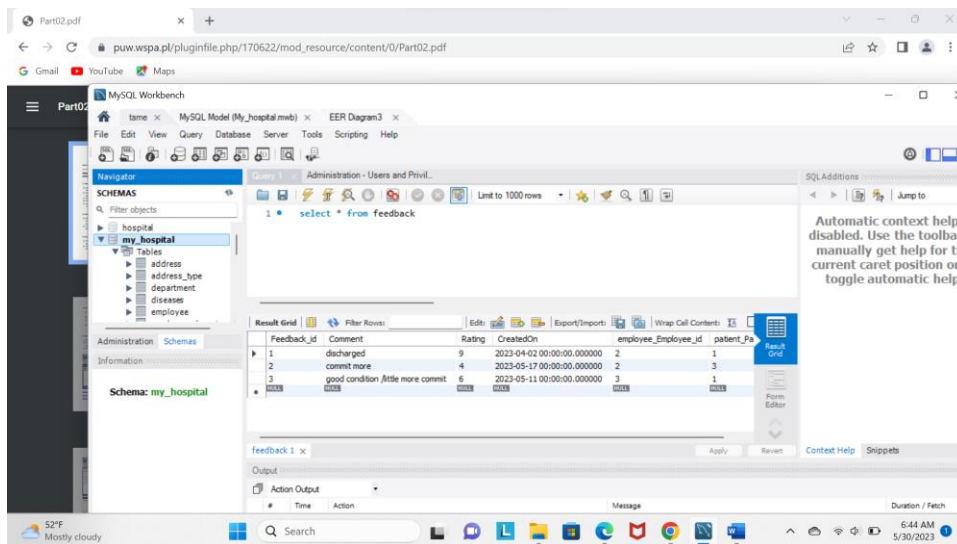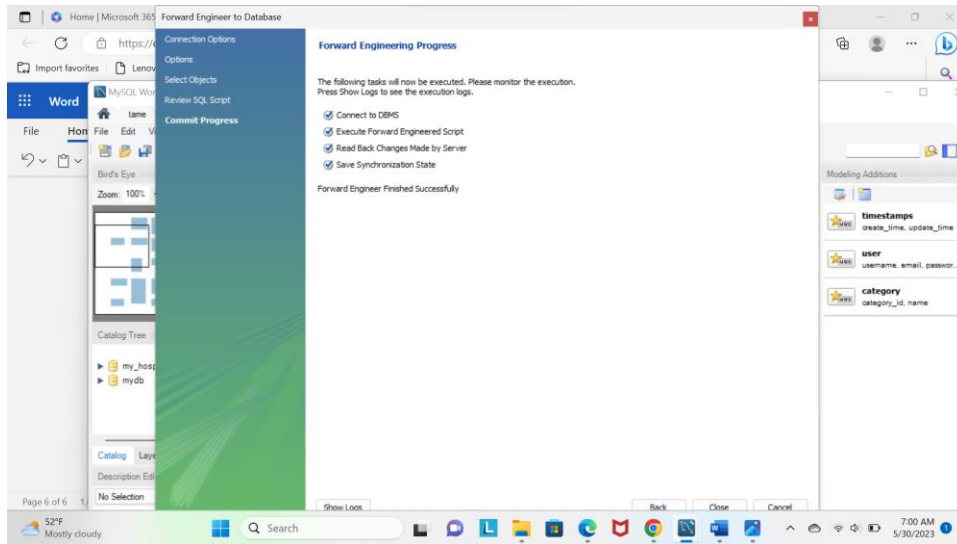
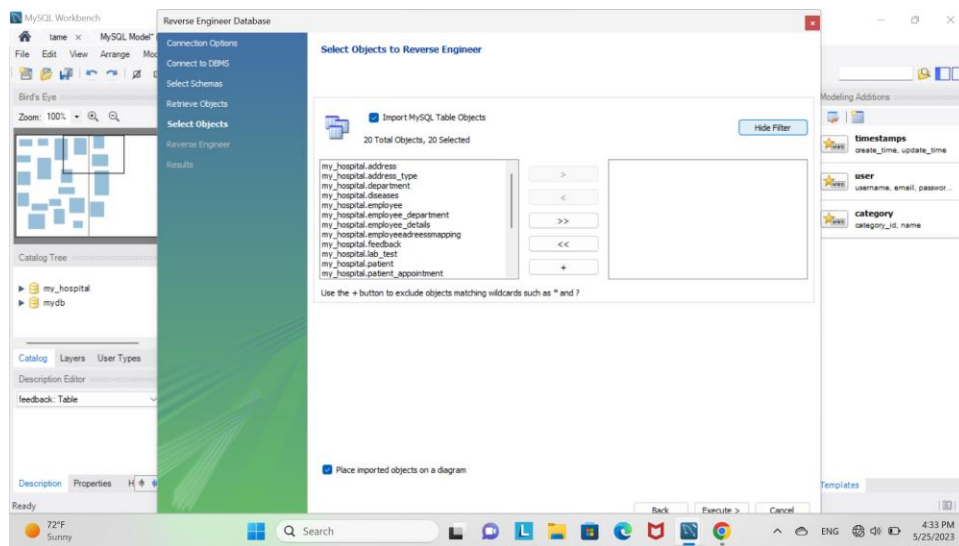B. we have exported the changes from our model to the database schema.
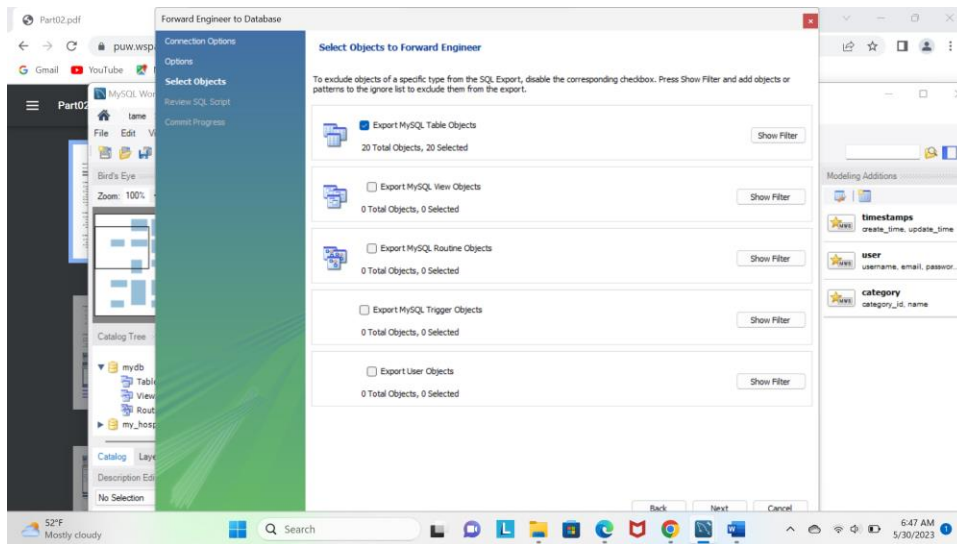
C & D. Synchronizing
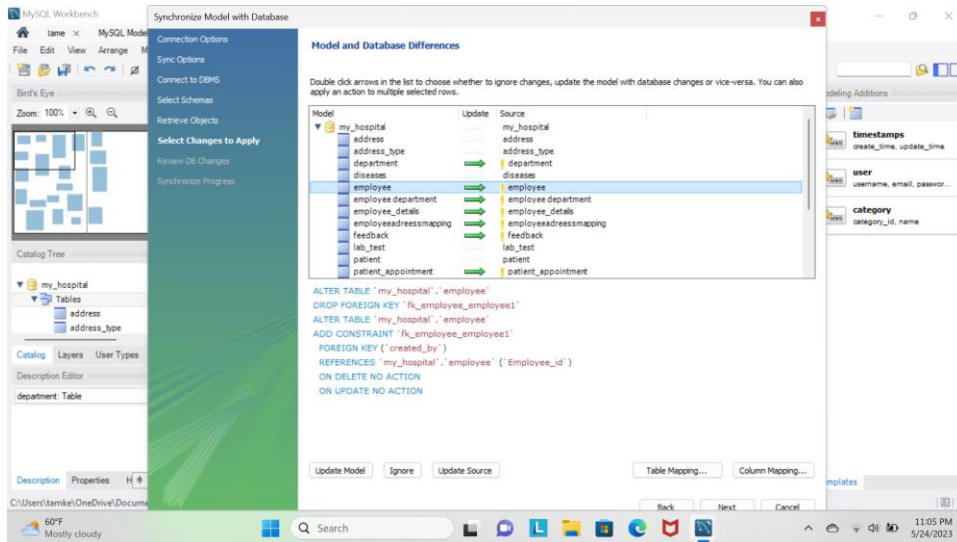
E.

2.Filling database table

A and B. we have filled all our tables with records, update and delete records

Screenshot 1 — MySQL Workbench, Query 1 tab

Query:
```
1 •  select * from department
```

Result Grid:

Department_id	DepartmentName
1	Neurology
2	Cardiology
3	Dental
NULL	NULL

Action Output:

#	Time	Action	Message	Duration / Fetch
1	08:51:20	select * from department LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
2	08:57:53	select * from department LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
3	08:59:33	select * from department LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

Status: Query Completed — 8:59 AM 5/25/2023

Screenshot 2 — Apply SQL Script to Database

Review the SQL Script to be Applied on the Database
```
1  INSERT INTO `hospital`.`department` (`DepartmentName`) VALUES ('Neurology');
2  INSERT INTO `hospital`.`department` (`DepartmentName`) VALUES ('Cardiology');
3  INSERT INTO `hospital`.`department` (`DepartmentName`) VALUES ('Dental');
4
```
Buttons: Back | Apply | Cancel — Ready — 8:56 AM 5/25/2023

Screenshot 3 — Apply SQL Script to Database

Review the SQL Script to be Applied on the Database
```
1  UPDATE `my_hospital`.`employee` SET `CreatedON` = '2022-03-14 09:25:33.0000
2  UPDATE `my_hospital`.`employee` SET `CreatedON` = '2022-04-16 12:00:08.0000
3  UPDATE `my_hospital`.`employee` SET `CreatedON` = '2022-05-01 11:00:00.0000
4
```
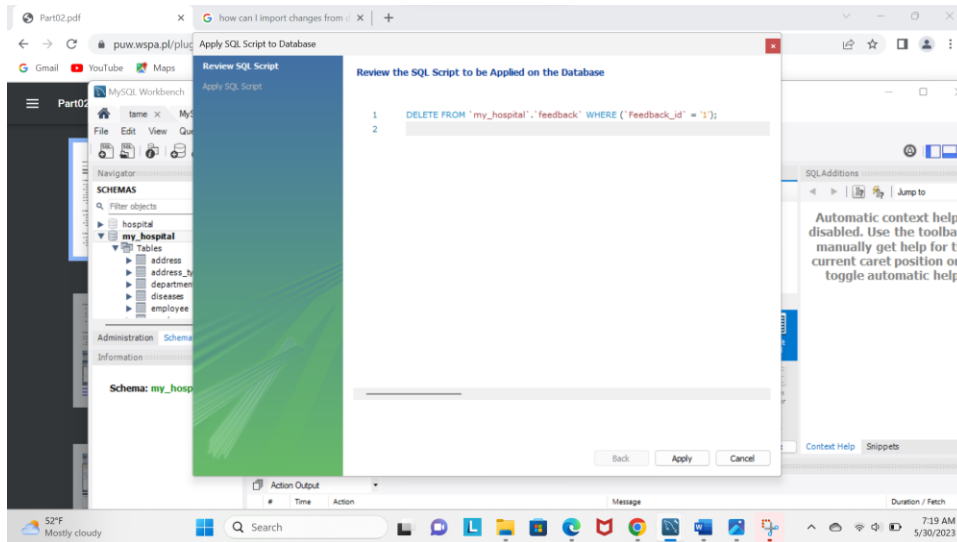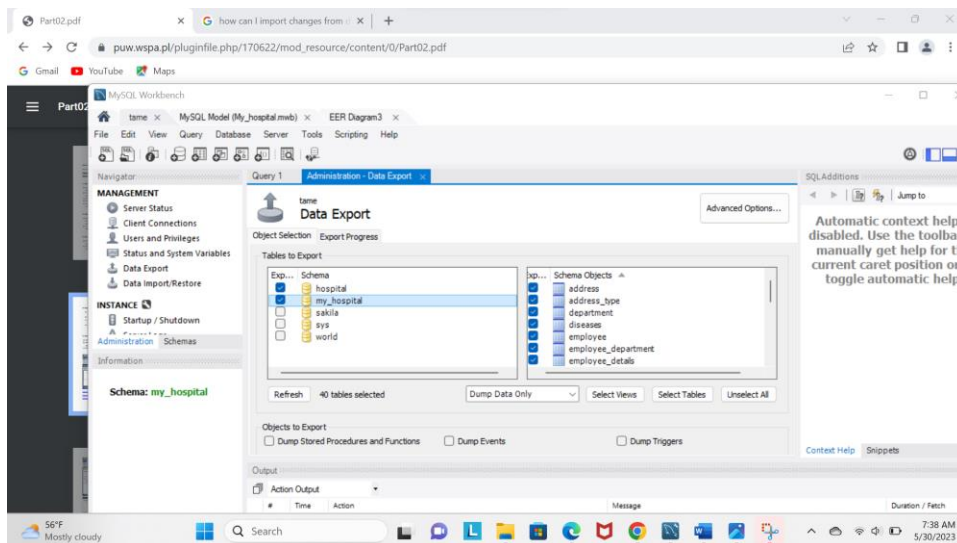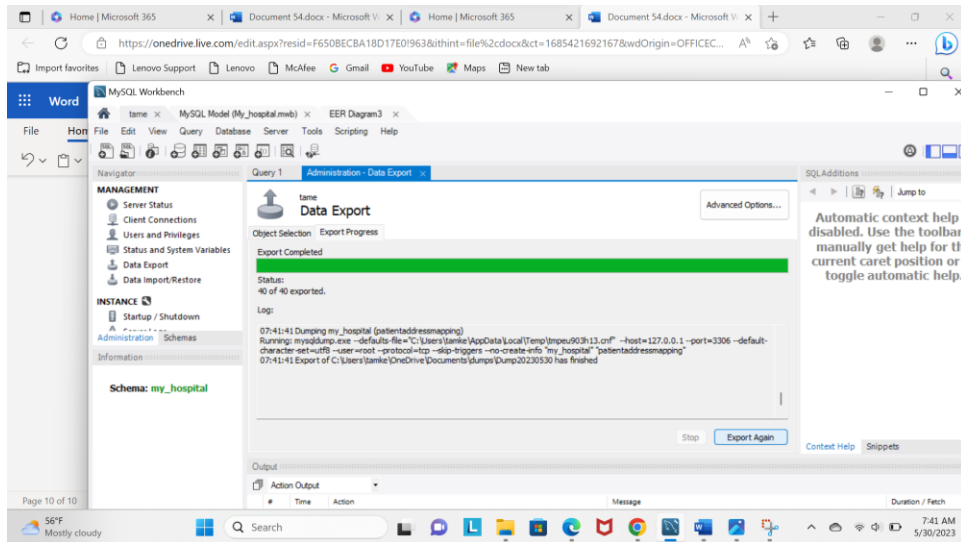Buttons: Back | Apply | Cancel — Query Completed — 9:18 AM 5/25/2023

3.we have attached DDL script for both **file name (database part2 3.a and database part2 3.b)**

4.

A. exporting only data from selected tables

Attached file name: database part2 4.a

B. Exporting data from a single table using select outfine

select *

from address

into outfile "C:\Users\tamke\OneDrive\Documents\dumps\Dump20230525 (1)\my_hospital_address.sql"

fields terminated by ','

enclosed by '"'

lines terminated by '\n';

c. exporting data from multiple tables by joining

select *

from patient_register

join patient

on patient.patient_id = patient_register.patient_Patient_Id

into outfile "C:\Users\tamke\OneDrive\Documents\dumps\Dump20230525 (1)"

fields terminated by ','

enclosed by '"'

D. Importing data from a file to a single table in a database

Load data infile

"C:\Users\tamke\OneDrive\Documents\dumps\Dump20230525 (1)\my_hospital_employee.sql"

into table employee

fields terminated by ','

enclosed by '"'

lines terminated by '\n';

5.

A. we have it on file name: **database part2 5.a**

B. copying dump files using command line

C:\Users\tamke>"C:\Program Files\MySQL\MySQL Server 8.0\bin\mysqldump.exe" --host=127.0.0.1 --port=3306 --default-character-set=utf8 --user=root --protocol=tcp -p --no-data --skip-triggers "my_hospital"
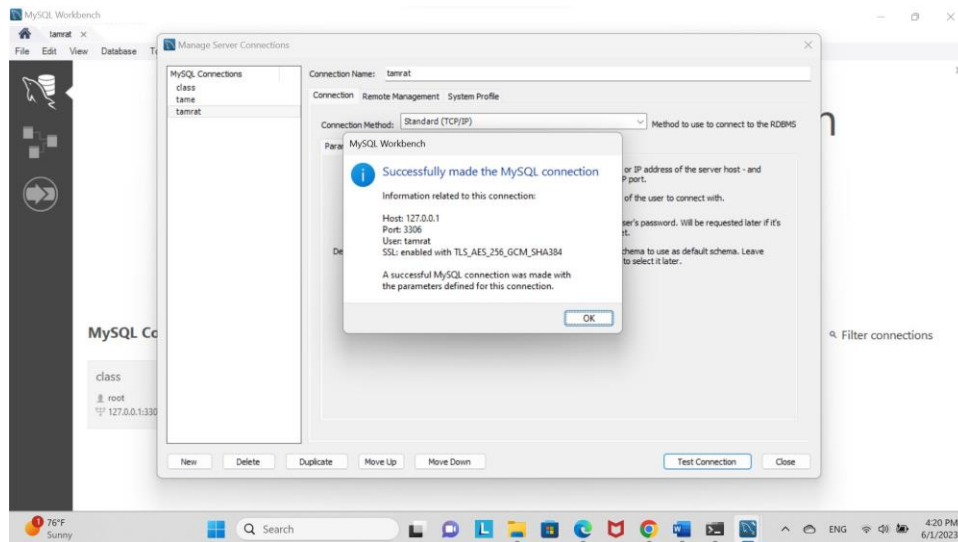
Enter password: ******

c. Restoring database

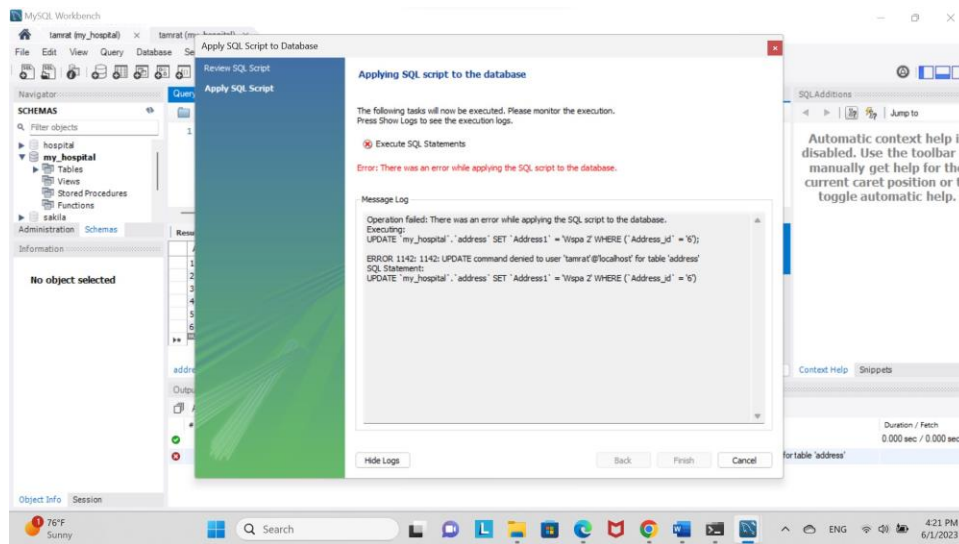**mysql -u=root -p "my-hospital" "C:\Program Files\MySQL\MySQL Server 8.0\bin\mysqldump.exe"**

Part 3

1.

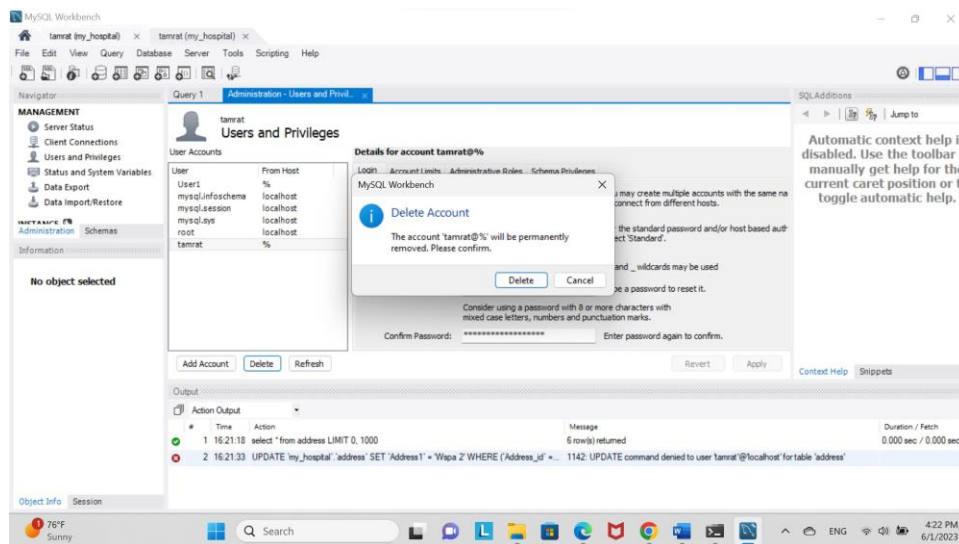A. Creating user

B. testing user

c. Delete user

2.

A. In our project we set three users as an example. Those are Patient, Doctor and Managing staff.

Now we will briefly describe their characteristics,

Doctor: Doctors can hold checkups, can add medical records to the hospital database plus they will have the right to access medical information of different patients and they will also have the access to their accounts in the hospital.

Patient: Patients have the privilege to update their personal information and have the right to access their medical information without updating anything.

Managing staff: has the access for all information in the database.

B. In our database each user can have different privileges

Patient: will have a role USER ADMIN and privileges like create user, update user info.

Doctor: will have a role USER ADMIN and privilege like create user, update user , insert , File , Alter.

Managing staff: will have all the roles and privileges.

c. The roles that are predefined in My SQL include:

- **DBA**: This role has all privileges.
- **DB Designer**: This role has privileges to create and alter tables and views.
- **Backup Admin**: This role has privileges to perform backups and restores.
- **Security Admin**: This role has privileges to manage user accounts and roles.
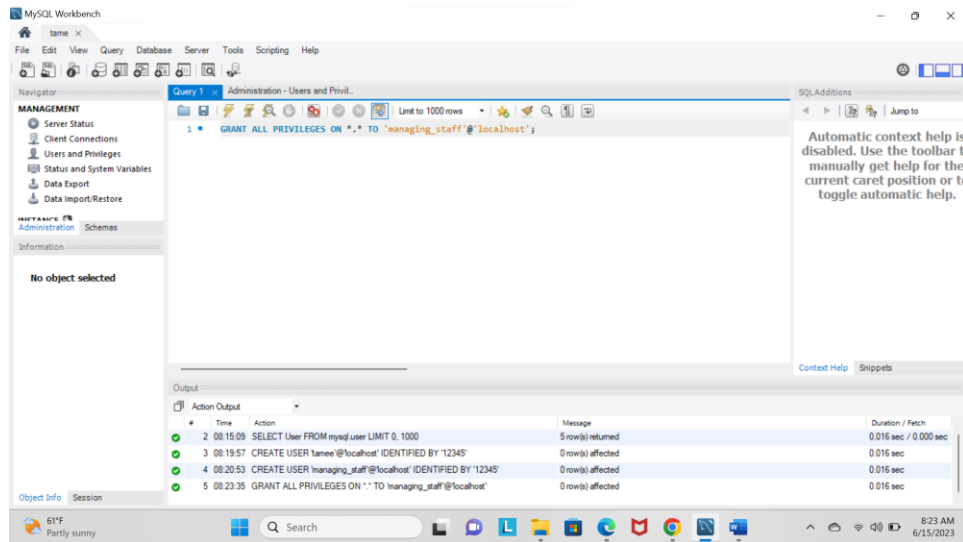- **Replication Admin**: This role has privileges to manage replication.

3.

A. to display all available users we can use this query

```
SELECT User FROM mysql.user;
```

B. Here we will create user Managing_staff:
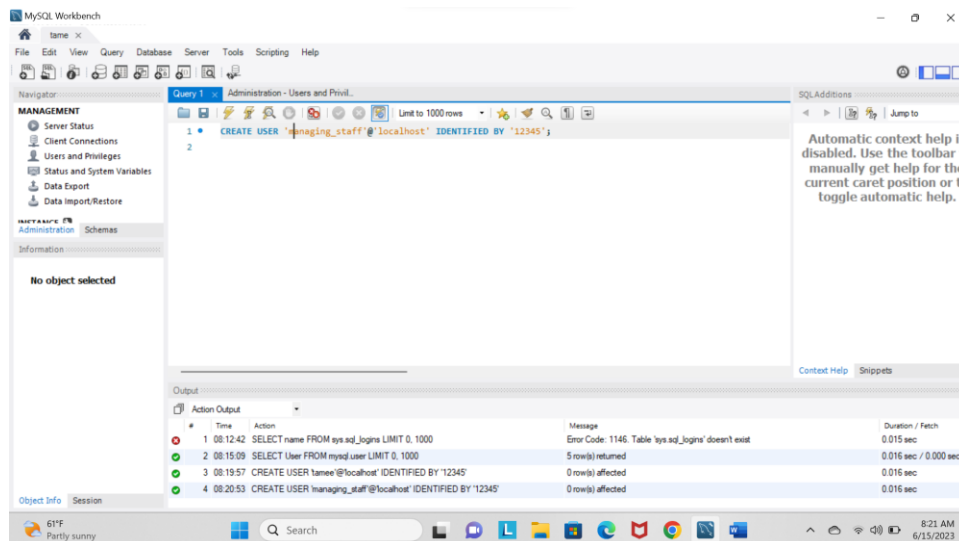
c. Here we will give appropriate privilege for our user

4.

a)

REVOKE

privilege [,privilege]..

ON [object_type] privilege_level

FROM user1

b)

REVOKE

ALL [PRIVILEGES],

GRANT OPTION

FROM user1

c)

GRANT role_name

TO user_name;

d)

RENAME USER old_user1

TO new_user;

e)

CREATE ROLE role_name;
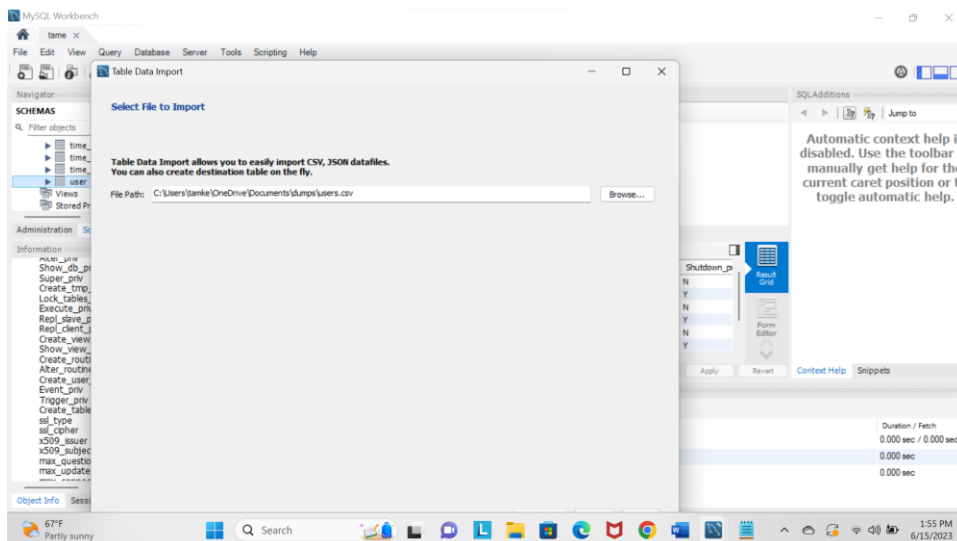

g)

ALTER USER [IF EXISTS]

User_name

ACCOUNT UNLOCK;

h)

DROP USER 'user_name'@'localhost';

5.A. we have exported the users in users.csv file

B. Importing users

DONE!!