A Report

On the work done during 3rd semester subject

Database Management Systems

of

B.Tech. Computer Engineering

BloodBank Management System

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Brief information about the system :

The Blood Bank Management System is a comprehensive software solution designed to streamline and enhance the operations of a blood bank or blood donation center. This system plays a crucial role in ensuring the efficient collection, storage, distribution, and tracking of blood and blood-related products. It is a vital tool for maintaining an adequate and safe blood supply to meet the medical needs of a community or region.

Key Components and Features:

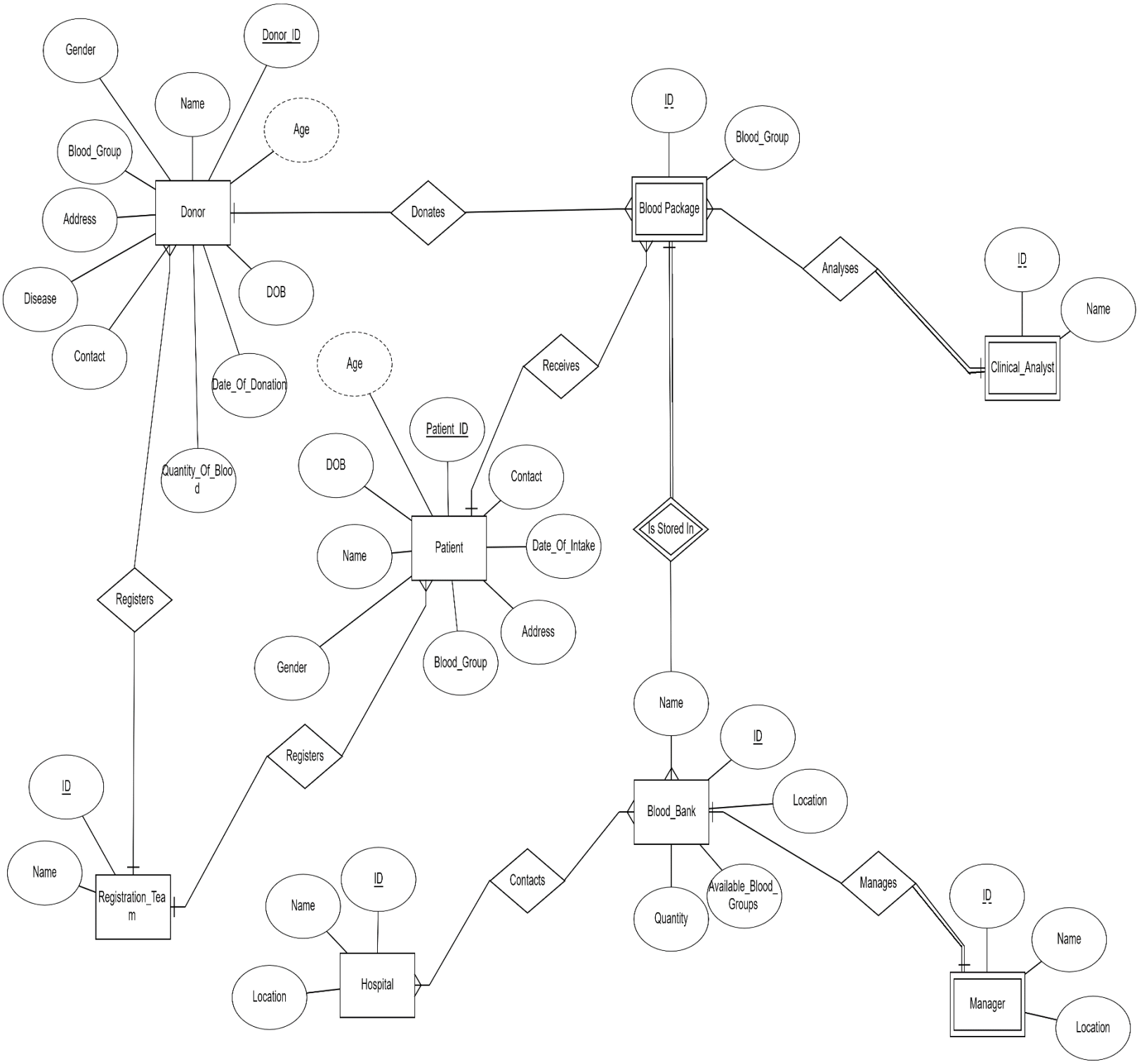
1. **Donor Management:** The system allows for the registration and management of blood donors, including their personal information, medical history, and blood group. It keeps track of donor records and their donation history.
2. **Blood Bank Inventory:** It manages the inventory of blood and blood-related products, ensuring proper storage and tracking of available units. The system can provide real-time updates on the quantity of each blood type and expiration dates.
3. **Clinical Analyst Integration:** Clinical analysts can access the system to perform essential tests on donated blood, such as blood typing and screening for diseases. The results are recorded in the system and can trigger alerts or actions based on the findings.
4. **Patient Management:** Hospitals and healthcare facilities can use the system to request and manage blood product orders, track deliveries, and match patient blood requirements with available donations.
5. **User Roles and Permissions:** The system typically supports various user roles, such as administrators, clinical analysts, donors, and hospital staff, with role-based permissions to ensure data security and privacy.
6. **Reports and Analytics:** It provides reporting and analytical tools to monitor blood usage, donor trends, and inventory levels. This data can help in making informed decisions and planning for future blood collection drives.
7. **User Documentation:** User manuals and guides are often included to ensure that users can effectively navigate and utilize the system.

Benefits:

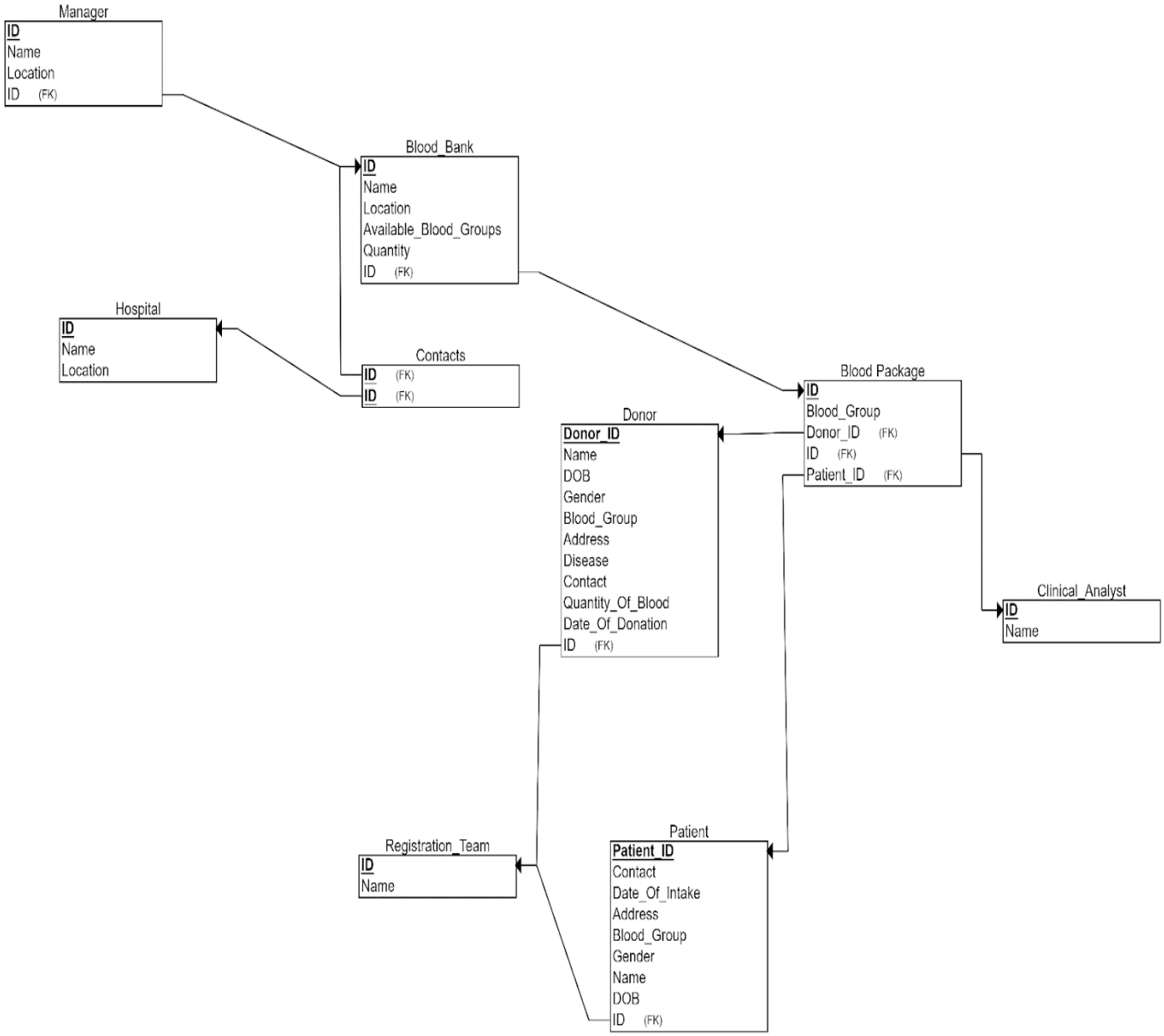
- **Efficiency:** Automation of processes like donor registration, inventory management, and test result recording significantly improves operational efficiency.
- **Data Accuracy:** The system reduces the risk of errors in recording and tracking blood-related data, which is critical for patient safety.
- **Timely Blood Availability:** Hospitals and clinics can access real-time information about blood availability, ensuring that patients receive the blood they need promptly.
- **Safety and Compliance:** It helps ensure compliance with regulatory standards, including proper blood storage and disease screening.
- **Data Analysis:** The system offers data analysis capabilities that can reveal valuable insights for optimizing blood bank operations.
- **Donor Engagement:** By maintaining donor records and facilitating communication, the system can help foster ongoing donor engagement and blood donation drives.

Blood bank management systems are an indispensable part of the healthcare ecosystem, contributing to the safe and efficient supply of blood and blood products, ultimately saving lives and ensuring that medical institutions can provide critical care to patients.

ER Diagram:


Gender
Donor_ID
Name
Age
Blood_Group
Address
Donor
Donates
Blood Package
ID
Blood_Group
Disease
DOB
Contact
Date_Of_Donation
Analyses
ID
Name
Clinical_Analyst
Receives
Age
Patient_ID
DOB
Contact
Quantity_Of_Blood
Is Stored In
Name
Patient
Date_Of_Intake
Registers
Address
Gender
Blood_Group
Name
ID
Registers
Location
ID
Blood_Bank
Name
Contacts
Available_Blood_Groups
Quantity
Manages
ID
Name
Registration_Team
Name
ID
Hospital
Location
Manager
Location

Relational Schema(ER better representation) :



Schema :

Donor(Name,Gender,Blood_Group,Address,Diseases,Contact,Density_of_Blood,Date_of_donation,DOB,Age,Donor_id)

Blood package(Blood_Group,Blood_package_ID)

Cinical_Analyst(Analyst_ID,Name)

Blood_bank(Bank_ID,Name,Location,Available_Blood_Groups,Quantity)

Manager(Manager_ID,mgr_Name,Location)

Hospital(Hospital_ID,hospital_name,hospital_location)

Registration_Team(Reg_ID,Name)

Patient(Contact,Date_of_intake,Address,Blood_group,Gender,Name,DOB,Age,Address,patient_ID)

CRUD :

First we are creating and populating all the schemas:

```
-- Create Donor Table
CREATE TABLE Donor (
    Donor_id INT PRIMARY KEY,
    Name VARCHAR(255),
    Gender VARCHAR(10),
    Blood_Group VARCHAR(5),
    Address VARCHAR(255),
    Diseases VARCHAR(255),
    Contact VARCHAR(15),
    Density_of_Blood DECIMAL(5, 2),
    Date_of_donation DATE,
    DOB DATE,
    Age INT
);


-- Insert data into Donor Table
INSERT INTO Donor (Donor_id, Name, Gender, Blood_Group, Address, Diseases, Contact,
Density_of_Blood, Date_of_donation, DOB, Age)
VALUES
    (1001, 'John Doe', 'Male', 'A+', '123 Main St', 'Diabetes, Hypertension', '123-456-7890', 1.05, '2022-05-
10', '1978-03-15', 44),
```

```
   (1002, 'Jane Smith', 'Female', 'B-', '456 Elm St', 'None', '987-654-3210', 1.10, '2022-06-20', '1982-11-22', 39),

   (1003, 'Mark Johnson', 'Male', 'AB+', '789 Oak St', 'None', '555-123-4567', 1.15, '2022-07-30', '1990-08-18', 32),

   (1004, 'Sarah Wilson', 'Female', 'O-', '101 Pine St', 'Anemia, High Cholesterol', '333-777-9999', 0.95, '2022-08-15', '1985-07-10', 37);


-- Create Blood_package Table

CREATE TABLE Blood_package (

   Blood_package_ID VARCHAR(10) PRIMARY KEY,

   Blood_Group VARCHAR(5)

);


-- Insert data into Blood_package Table

INSERT INTO Blood_package (Blood_package_ID, Blood_Group)

VALUES

   ('BP001', 'A+'),

   ('BP002', 'B-'),

   ('BP003', 'AB+'),

   ('BP004', 'O-');


-- Create Clinical_Analyst Table

CREATE TABLE Clinical_Analyst (

   Analyst_ID INT PRIMARY KEY,

   Name VARCHAR(255)

);
```

```
-- Insert data into Clinical_Analyst Table
INSERT INTO Clinical_Analyst (Analyst_ID, Name)
VALUES
   (2001, 'Dr. Anderson'),
   (2002, 'Dr. Lewis'),
   (2003, 'Dr. Parker');

-- Create Blood_bank Table
CREATE TABLE Blood_bank (
   Bank_ID INT PRIMARY KEY,
   Name VARCHAR(255),
   Location VARCHAR(255),
   Available_Blood_Groups VARCHAR(255),
   Quantity INT
);

-- Insert data into Blood_bank Table
INSERT INTO Blood_bank (Bank_ID, Name, Location, Available_Blood_Groups, Quantity)
VALUES
   (3001, 'City Blood Bank', '123 Elm St', 'A+, B-, O+', 500),
   (3002, 'County Blood Bank', '456 Oak St', 'B+, AB-, O-', 300),
   (3003, 'Regional Blood Bank', '789 Maple St', 'A+, O+, AB-', 700);

-- Create Manager Table
CREATE TABLE Manager (
```

```
    Manager_ID INT PRIMARY KEY,
    mgr_Name VARCHAR(255),
    Location VARCHAR(255)
);

-- Insert data into Manager Table
INSERT INTO Manager (Manager_ID, mgr_Name, Location)
VALUES
    (4001, 'Mr. Johnson', 'City Office'),
    (4002, 'Ms. Smith', 'County Office'),
    (4003, 'Mr. Davis', 'Regional Office');

-- Create Hospital Table
CREATE TABLE Hospital (
    Hospital_ID INT PRIMARY KEY,
    hospital_name VARCHAR(255),
    hospital_location VARCHAR(255)
);

-- Insert data into Hospital Table
INSERT INTO Hospital (Hospital_ID, hospital_name, hospital_location)
VALUES
    (5001, 'City General Hospital', '123 Main St'),
    (5002, 'County Medical Center', '456 Elm St'),
    (5003, 'Regional Hospital', '789 Oak St');
```

```
-- Create Registration_Team Table
CREATE TABLE Registration_Team (
    Reg_ID INT PRIMARY KEY,
    Name VARCHAR(255)
);

-- Insert data into Registration_Team Table
INSERT INTO Registration_Team (Reg_ID, Name)
VALUES
    (6001, 'Team Alpha'),
    (6002, 'Team Beta'),
    (6003, 'Team Gamma');

-- Create Patient Table
CREATE TABLE Patient (
    Patient_ID INT PRIMARY KEY,
    Contact VARCHAR(15),
    Date_of_intake DATE,
    Address VARCHAR(255),
    Blood_group VARCHAR(5),
    Gender VARCHAR(10),
    Name VARCHAR(255),
    DOB DATE,
    Age INT
```

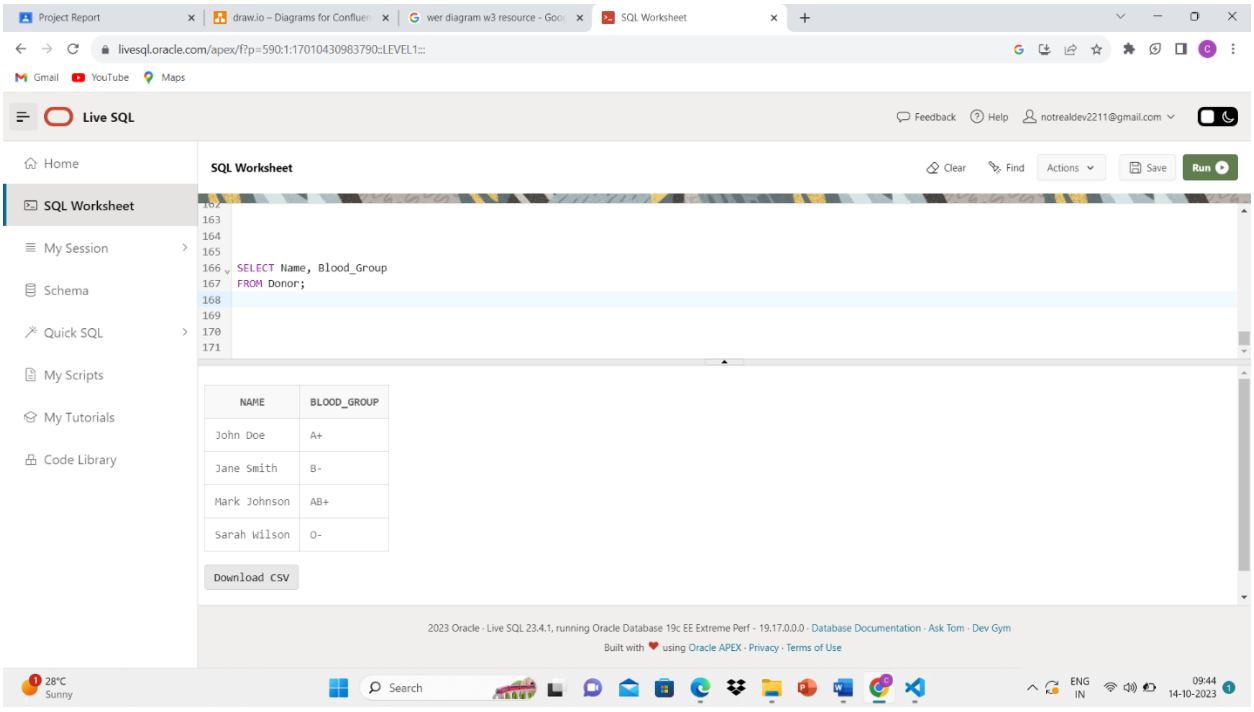
```
);


-- Insert data into Patient Table

INSERT INTO Patient (Patient_ID, Contact, Date_of_intake, Address, Blood_group, Gender, Name, DOB, Age)

VALUES

    (7001, '555-999-1234', '2022-07-15', '101 Pine St', 'A-', 'Male', 'Michael Johnson', '1970-11-05', 51),

    (7002, '777-111-9876', '2022-08-05', '202 Elm St', 'B+', 'Female', 'Emma White', '1985-03-20', 37),

    (7003, '333-555-7777', '2022-06-25', '303 Oak St', 'O+', 'Male', 'Daniel Miller', '1992-09-15', 29);
```

some meaningful queries and answer for our above schemas in SQL:

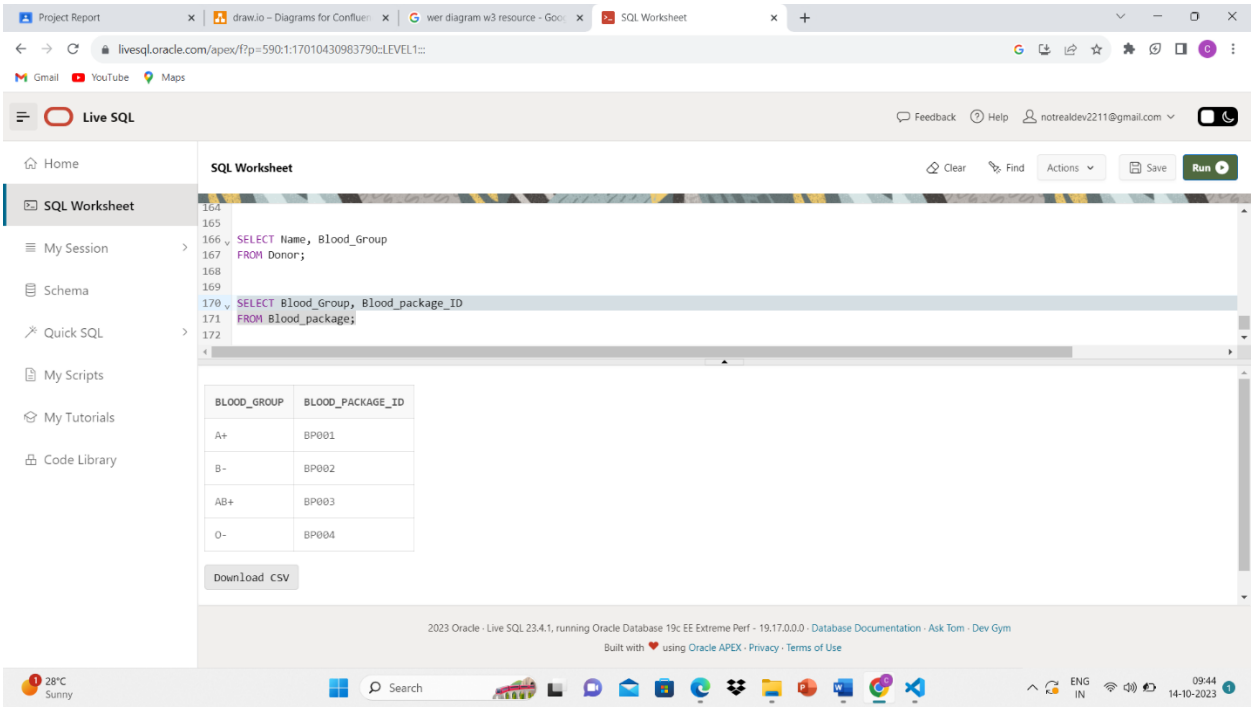
-- Retrieve All Donors with Their Blood Groups

SELECT Name, Blood_Group

FROM Donor;



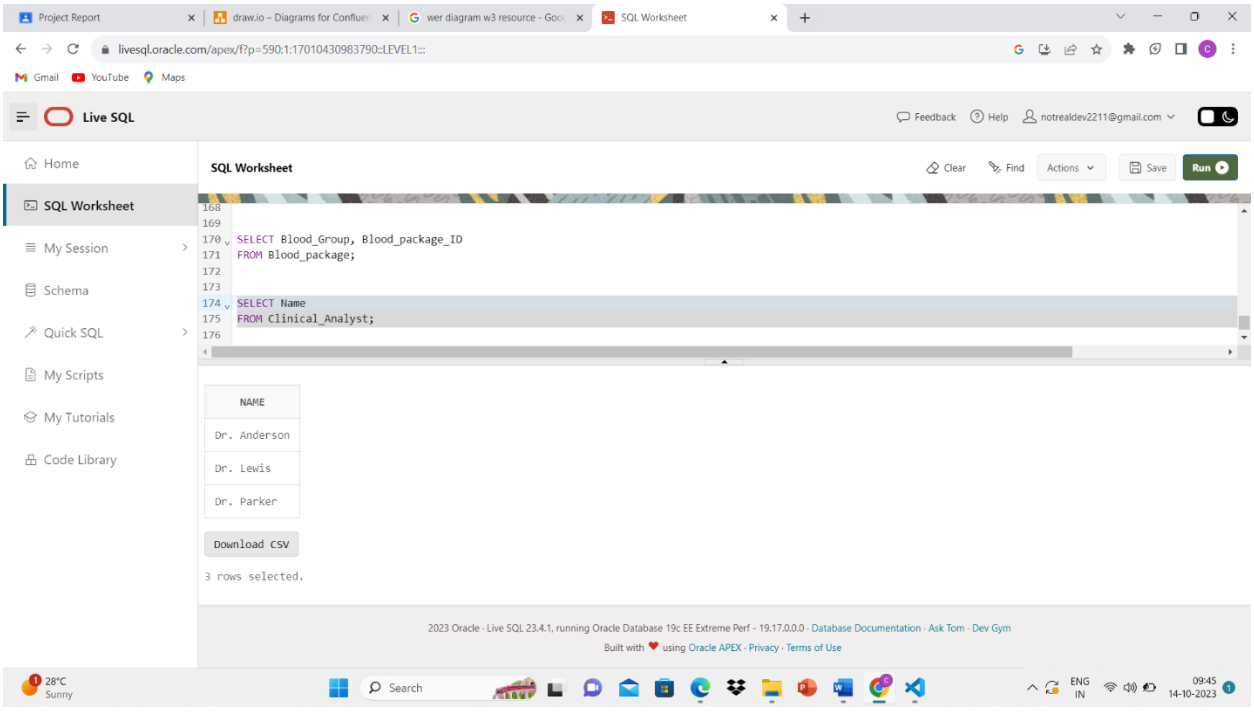
```
-- Find the Blood Packages for Each Blood Group

SELECT Blood_Group, Blood_package_ID

FROM Blood_package;
```



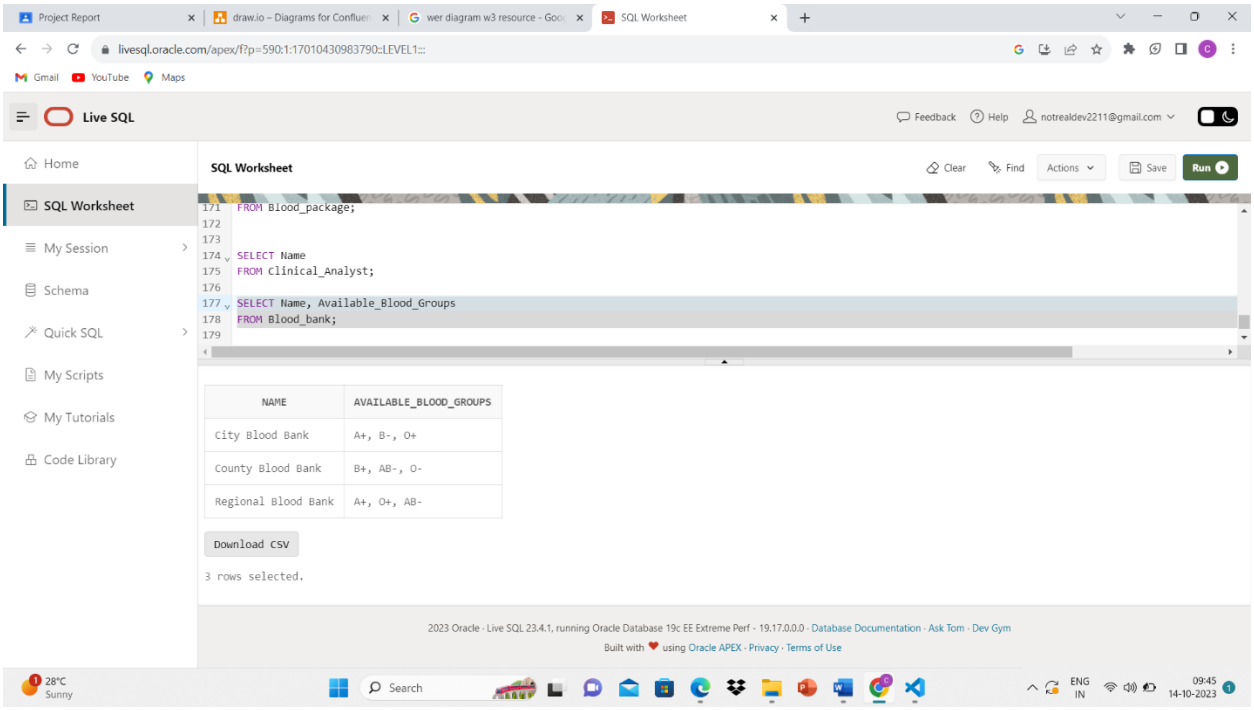
-- List the Clinical Analysts

SELECT Name

FROM Clinical_Analyst;



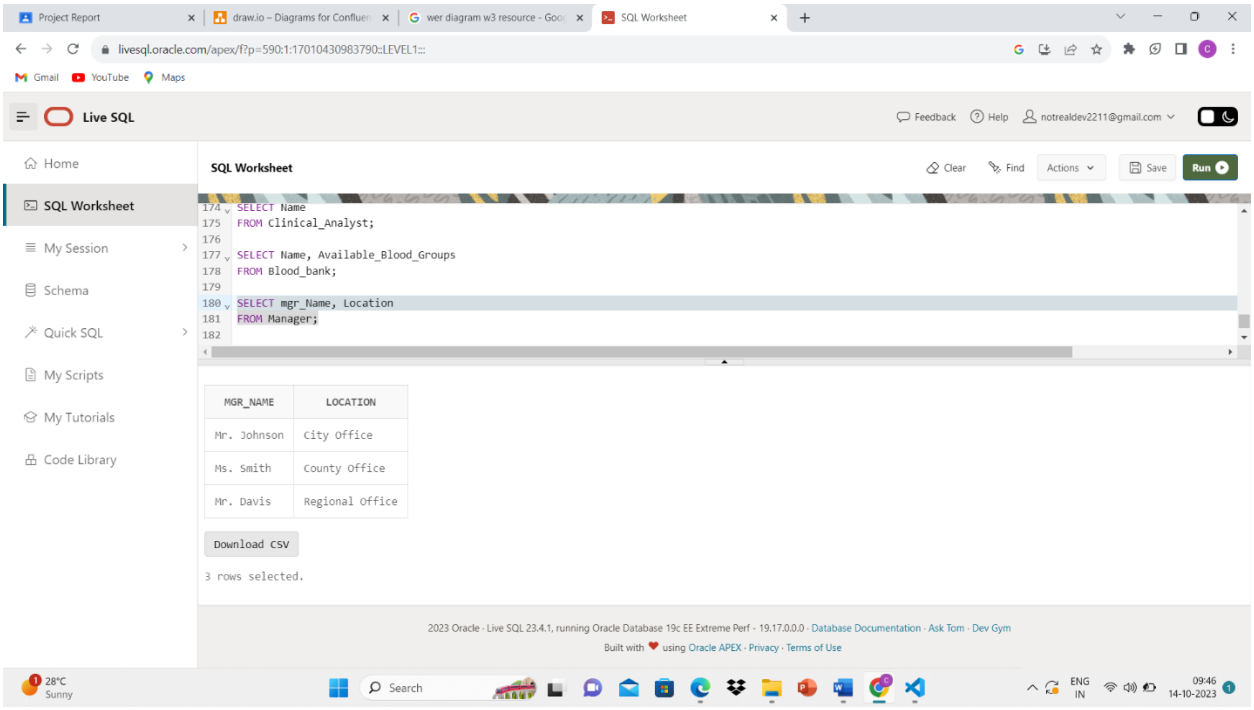
```
-- Retrieve Blood Banks and Their Available Blood Groups

SELECT Name, Available_Blood_Groups

FROM Blood_bank;
```



-- Get the Name and Location of Managers

SELECT mgr_Name, Location

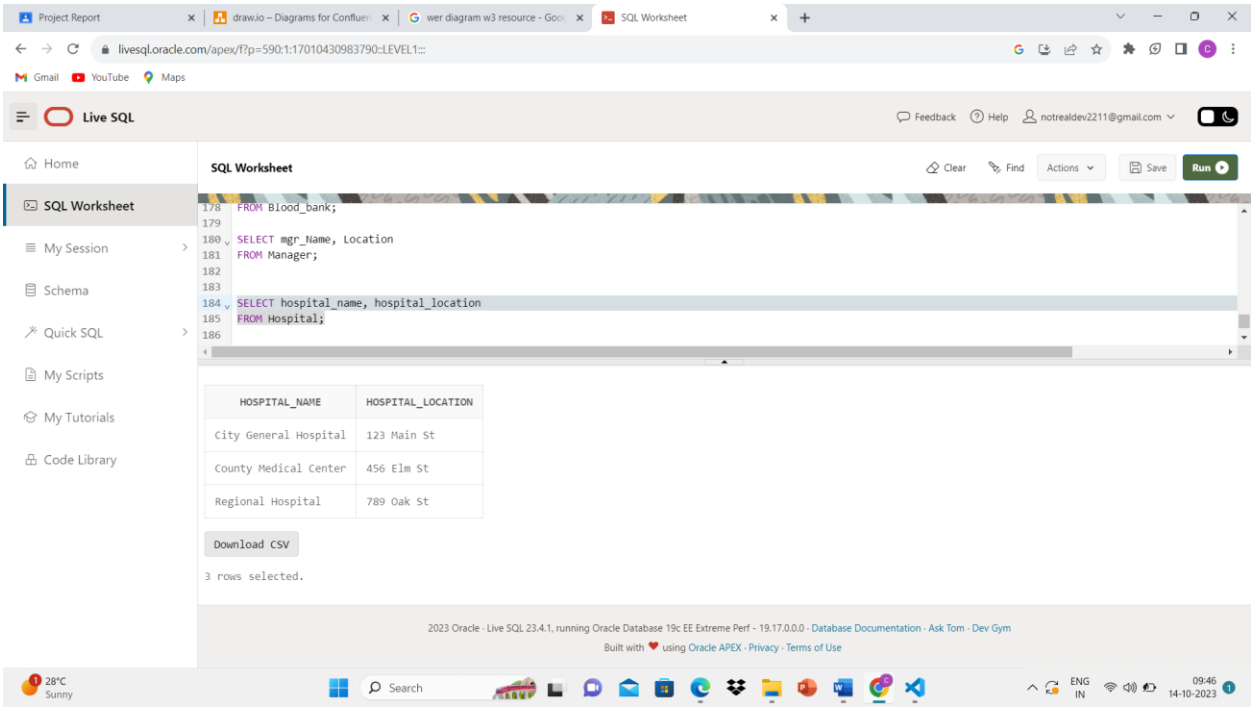
FROM Manager;



-- List Hospitals and Their Locations

SELECT hospital_name, hospital_location

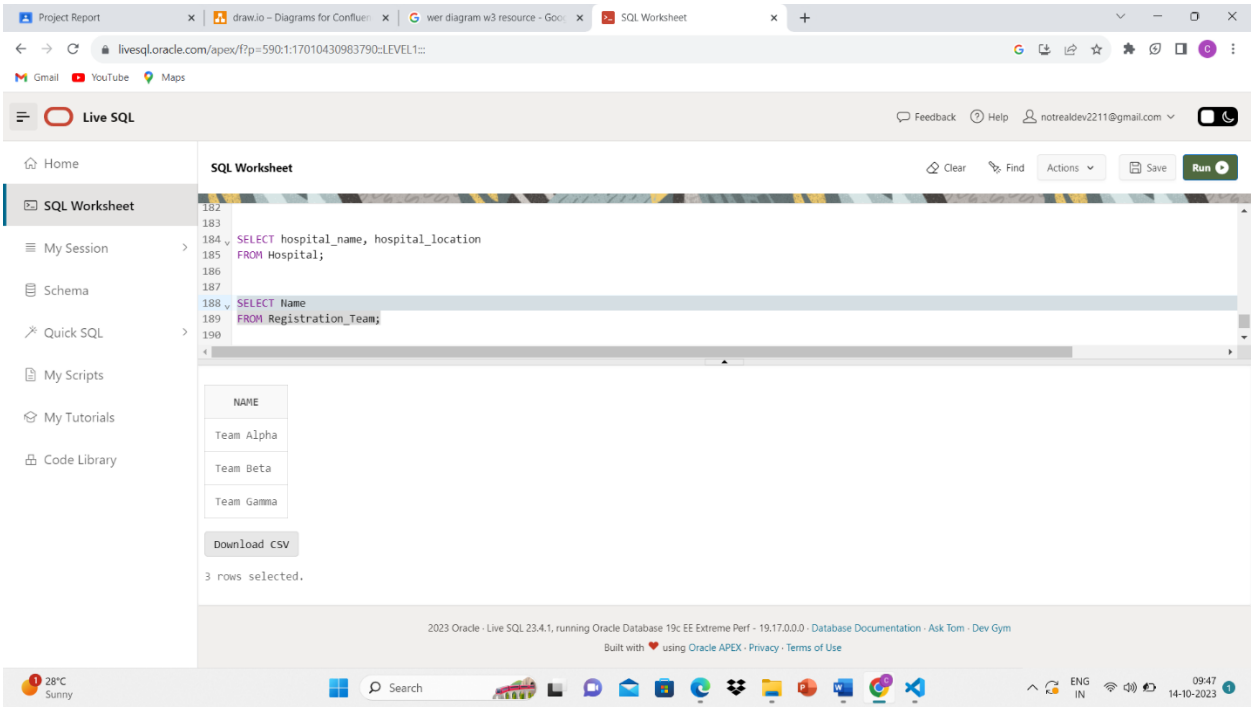
FROM Hospital;



-- Retrieve Names of Registration Teams

SELECT Name

FROM Registration_Team;

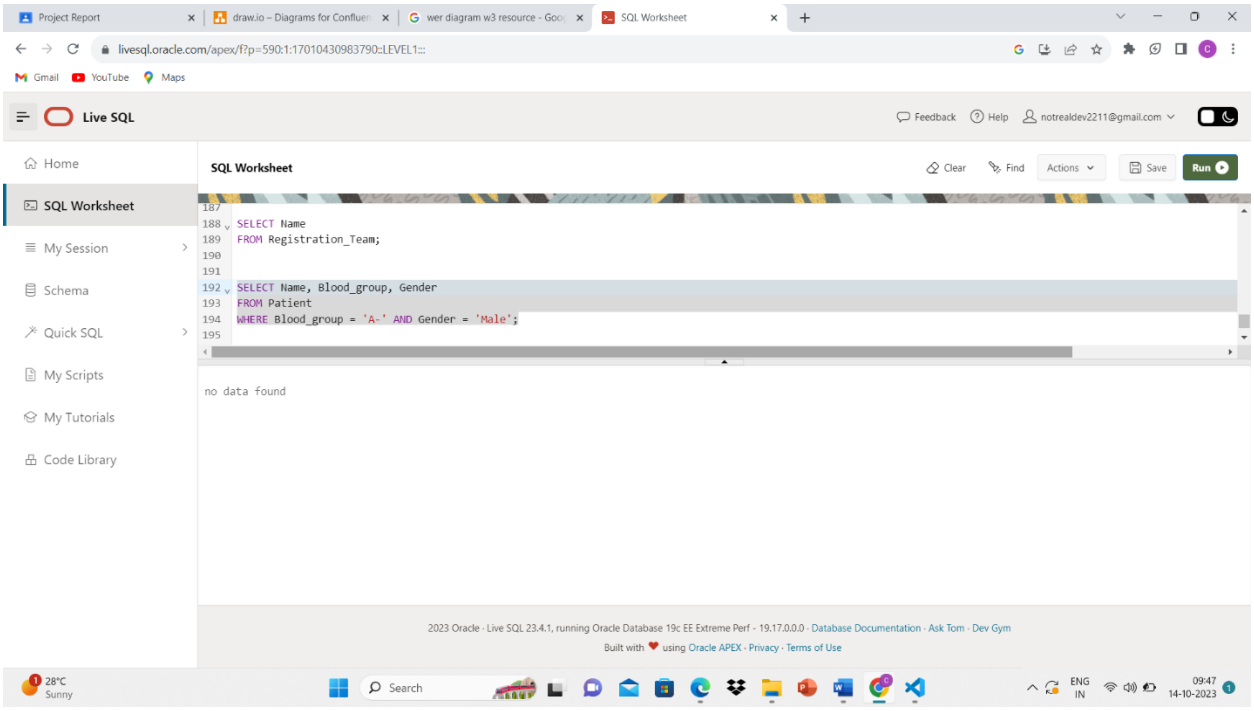


-- Find Patients by Blood Group and Gender

SELECT Name, Blood_group, Gender

FROM Patient

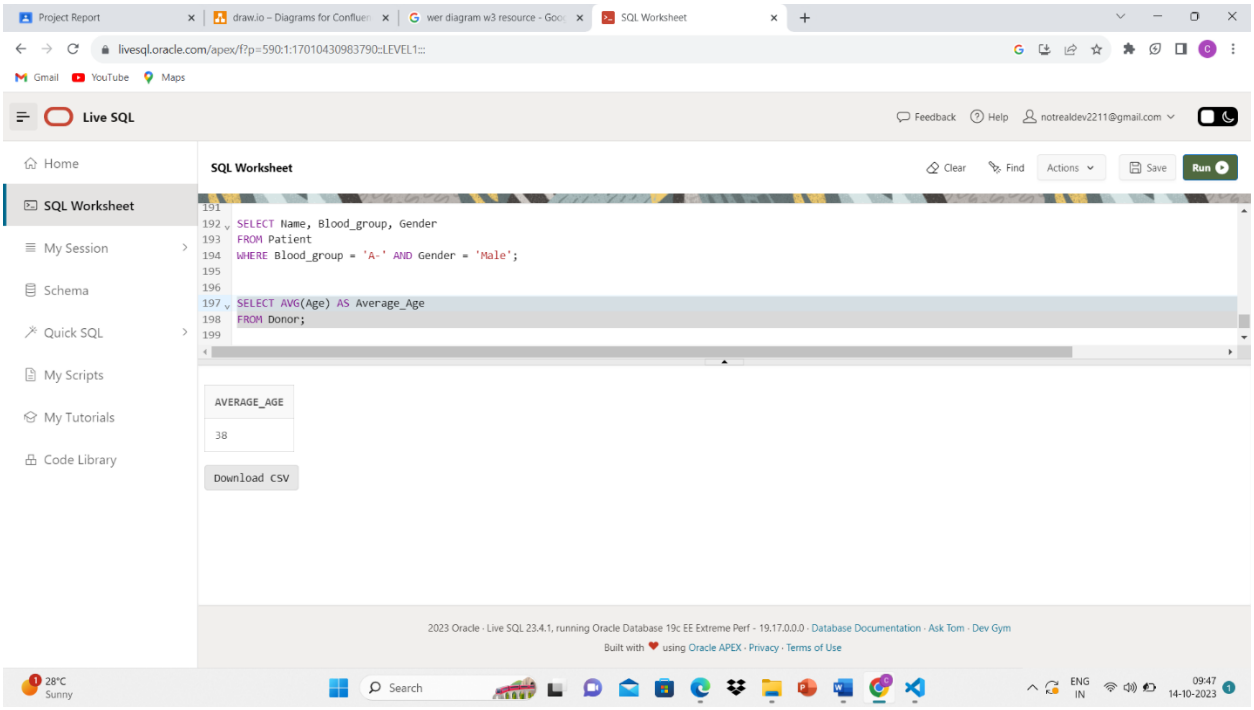
WHERE Blood_group = 'A-' AND Gender = 'Male';



-- Calculate the Average Age of Donors

SELECT AVG(Age) AS Average_Age

FROM Donor;



```
-- Count the Number of Blood Banks

SELECT COUNT(*) AS Number_of_Blood_Banks

FROM Blood_bank;
```