

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:

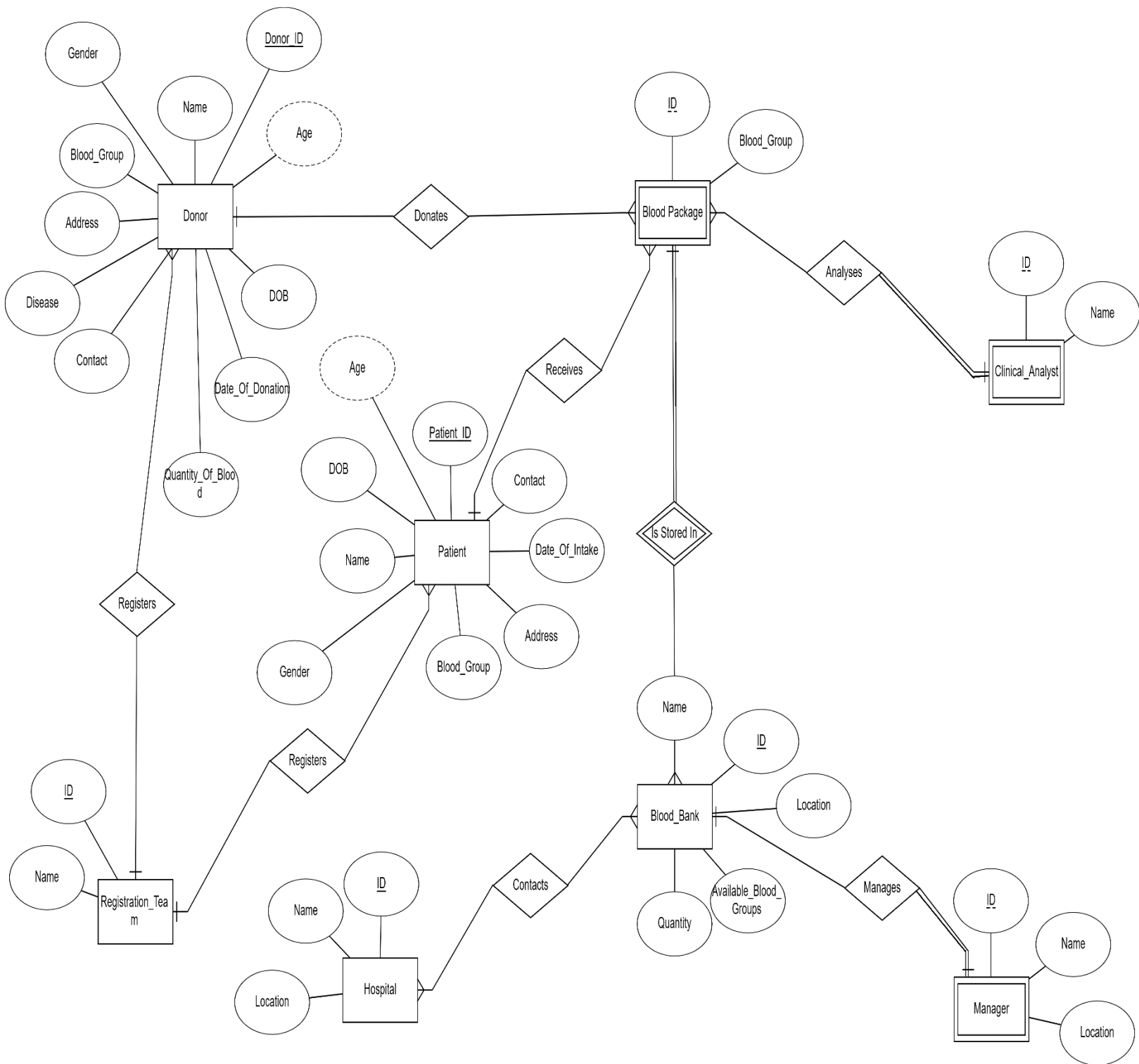
1. **Donor Management:** The system allows for the registration and management of blood donors, including their personal information, medical history, and blood group. It keeps track of donor records and their donation history.
2. **Blood Bank Inventory:** It manages the inventory of blood and blood-related 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:

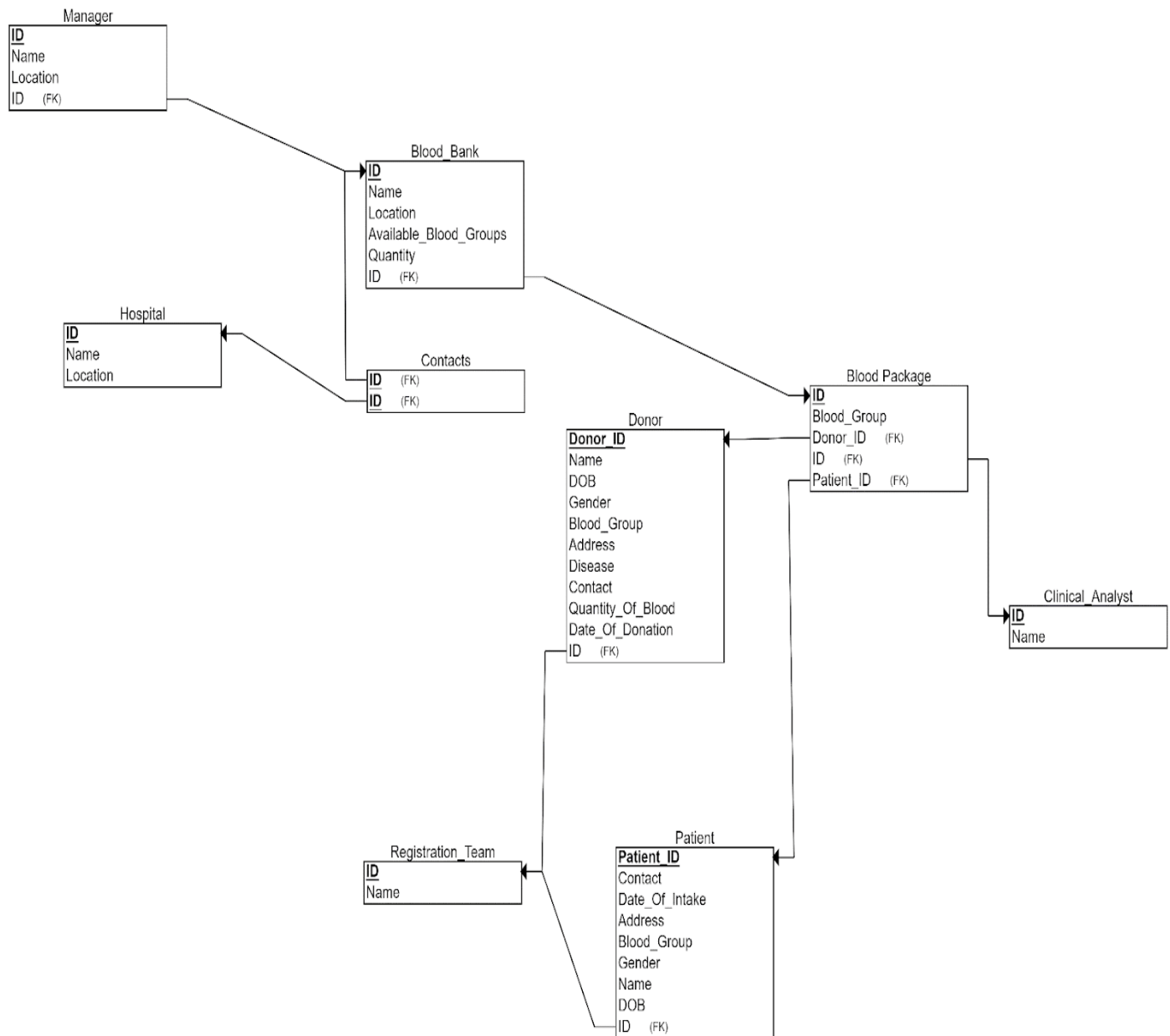
- **Efficiency:** Automation of processes like donor registration, inventory management, and test result recording significantly improves operational efficiency.
- **Data Accuracy:** The system reduces the risk of errors in recording and tracking blood-related data, which is critical for patient safety.
- **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:



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;

The screenshot shows a web browser window with the 'Live SQL' application. The browser's address bar displays the URL: `livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::`. The application's top navigation bar includes a 'Live SQL' logo, a 'Feedback' link, a 'Help' link, a user profile icon for 'notrealdev2211@gmail.com', and a dark mode toggle. A left-hand sidebar contains navigation links: 'Home', 'SQL Worksheet' (which is selected), 'My Session', 'Schema', 'Quick SQL', 'My Scripts', 'My Tutorials', and 'Code Library'. The main content area is titled 'SQL Worksheet' and features a text editor with the SQL query: `SELECT Name, Blood_Group` on line 166 and `FROM Donor;` on line 167. Below the editor, a table displays the query results. The table has two columns, 'NAME' and 'BLOOD_GROUP', and contains four rows of data. A 'Download CSV' button is located below the table. At the bottom of the application, a status bar provides technical details: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym' and 'Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the very bottom shows the system clock at 09:44 on 14-10-2023, along with various system icons and application shortcuts.

NAME	BLOOD_GROUP
John Doe	A+
Jane Smith	B-
Mark Johnson	AB+
Sarah Wilson	O-

-- Find the Blood Packages for Each Blood Group

SELECT Blood_Group, Blood_package_ID

FROM Blood_package;

The screenshot shows the Oracle Live SQL web interface. The browser tabs include 'Project Report', 'draw.io - Diagrams for Confluence', 'wer diagram w3 resource - Go', and 'SQL Worksheet'. The address bar shows the URL 'livesql.oracle.com/apex/f?p=590:1:17010430983790::LEVEL1:'. The page header includes 'Live SQL', 'Feedback', 'Help', and a user profile 'notrealdev2211@gmail.com'. The left sidebar contains navigation links: 'Home', 'SQL Worksheet' (selected), 'My Session', 'Schema', 'Quick SQL', 'My Scripts', 'My Tutorials', and 'Code Library'. The main area is titled 'SQL Worksheet' and contains a SQL query:

```
164  
165  
166 SELECT Name, Blood_Group  
167 FROM Donor;  
168  
169  
170 SELECT Blood_Group, Blood_package_ID  
171 FROM Blood_package;  
172
```

Below the query, the results of the second query are displayed in a table:

BLOOD_GROUP	BLOOD_PACKAGE_ID
A+	BP001
B-	BP002
AB+	BP003
O-	BP004

A 'Download CSV' button is located below the table. At the bottom of the interface, a status bar indicates '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym' and 'Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the bottom shows the date '14-10-2023' and time '09:44'.


```
-- List the Clinical Analysts
```

```
SELECT Name
```

```
FROM Clinical_Analyst;
```

The screenshot shows the Oracle Live SQL web interface. The browser tabs include 'Project Report', 'draw.io - Diagrams for Confluence', 'wer diagram w3 resource - Go', and 'SQL Worksheet'. The address bar shows the URL: livesql.oracle.com/apex/f?p=590:1:17010430983790::LEVEL1::. The page header includes 'Live SQL', 'Feedback', 'Help', and a user profile 'notrealdev2211@gmail.com'. The left sidebar contains navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a code editor with the following SQL query:

```
168  
169  
170 SELECT Blood_Group, Blood_package_ID  
171 FROM Blood_package;  
172  
173  
174 SELECT Name  
175 FROM Clinical_Analyst;  
176
```

Below the code editor, the results of the query are displayed in a table:

NAME
Dr. Anderson
Dr. Lewis
Dr. Parker

A 'Download CSV' button is located below the table. Below the table, it says '3 rows selected.' At the bottom of the page, there is a footer with the text: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the bottom shows the date and time as '14-10-2023 09:45' and the weather as '28°C Sunny'.

-- Retrieve Blood Banks and Their Available Blood Groups

SELECT Name, Available_Blood_Groups

FROM Blood_bank;

The screenshot shows the Oracle Live SQL web interface. The browser tabs include 'Project Report', 'draw.io - Diagrams for Confluence', 'wer diagram w3 resource - Google', and 'SQL Worksheet'. The address bar shows the URL 'livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::'. The interface has a sidebar with navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a code editor with the following SQL query:

```
171 FROM Blood_package;  
172  
173  
174 SELECT Name  
175 FROM clinical_Analyst;  
176  
177 SELECT Name, Available_Blood_Groups  
178 FROM Blood_bank;  
179
```

Below the code editor, the results of the query are displayed in a table:

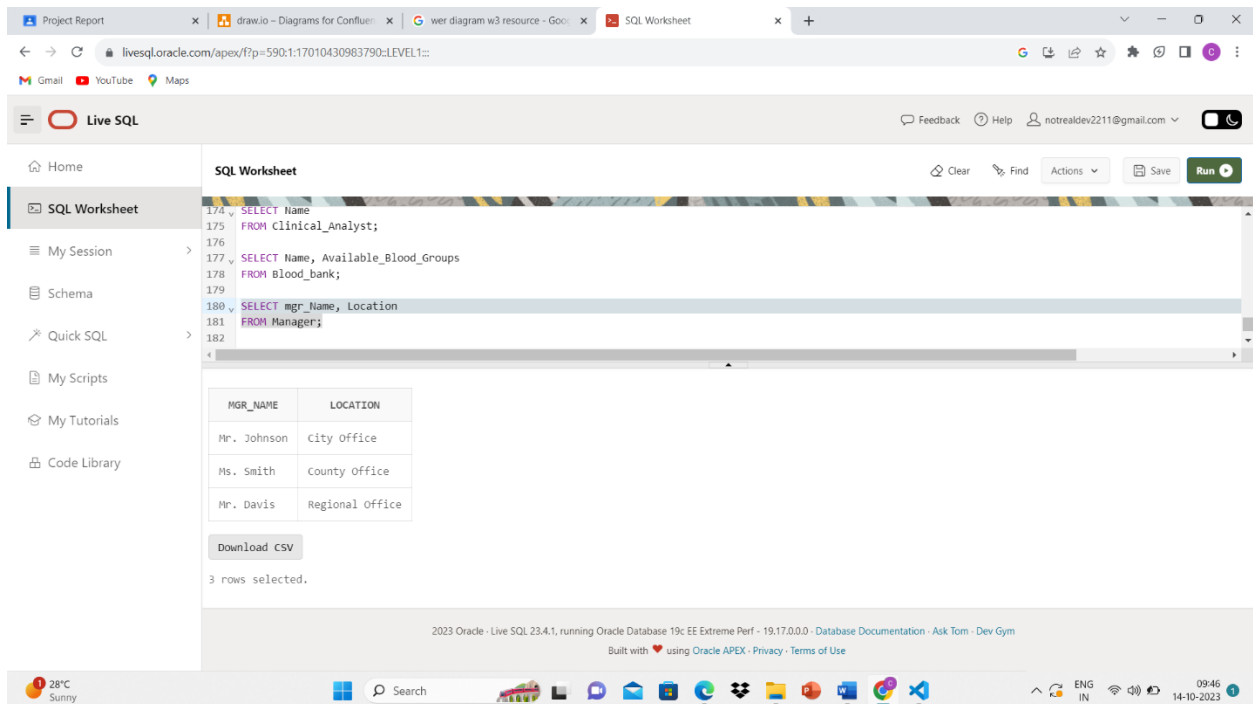
NAME	AVAILABLE_BLOOD_GROUPS
City Blood Bank	A+, B-, O+
County Blood Bank	B+, AB-, O-
Regional Blood Bank	A+, O+, AB-

A 'Download CSV' button is located below the table. Below the table, it says '3 rows selected.' At the bottom of the interface, there is a status bar with the text: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'. Below this, it says 'Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the bottom shows the date and time as '14-10-2023 09:45' and the temperature as '28°C Sunny'.

-- Get the Name and Location of Managers

SELECT mgr_Name, Location

FROM Manager;



The screenshot shows the Oracle Live SQL interface. The SQL Worksheet contains the following query:

```
174 SELECT Name
175 FROM Clinical_Analyst;
176
177 SELECT Name, Available_Blood_Groups
178 FROM blood_bank;
179
180 SELECT mgr_Name, Location
181 FROM Manager;
182
```

The results of the query are displayed in a table:

MGR_NAME	LOCATION
Mr. Johnson	City Office
Ms. Smith	County Office
Mr. Davis	Regional Office

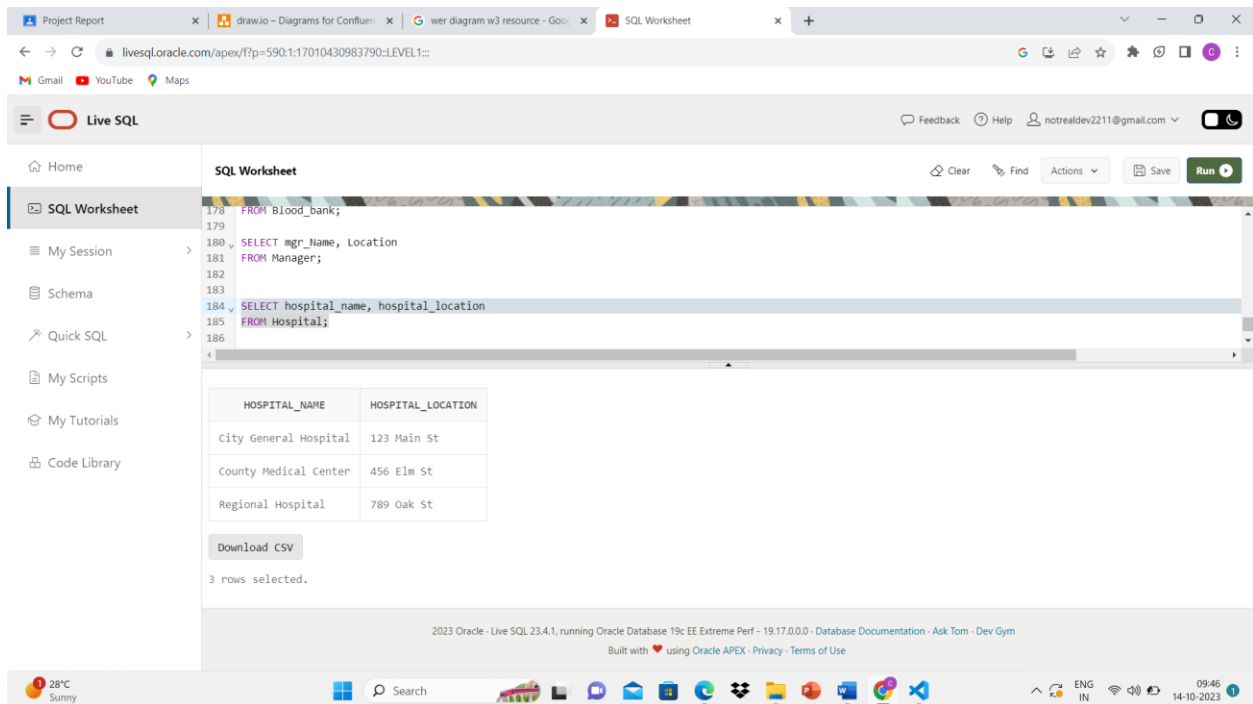
Below the table, it indicates "3 rows selected." and provides a "Download CSV" button.

The footer of the interface shows: "2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with using Oracle APEX - Privacy - Terms of Use".

-- List Hospitals and Their Locations

SELECT hospital_name, hospital_location

FROM Hospital;



The screenshot shows the Oracle Live SQL interface. The left sidebar contains navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled "SQL Worksheet" and contains a SQL query:

```
178 FROM Blood_bank;  
179  
180 SELECT mgr_name, Location  
181 FROM Manager;  
182  
183  
184 SELECT hospital_name, hospital_location  
185 FROM Hospital;  
186
```

Below the query, the results are displayed in a table:

HOSPITAL_NAME	HOSPITAL_LOCATION
City General Hospital	123 Main St
County Medical Center	456 Elm St
Regional Hospital	789 Oak St

A "Download CSV" button is located below the table. Below the table, it says "3 rows selected." At the bottom of the interface, there is a footer with the text: "2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with using Oracle APEX - Privacy - Terms of Use". The Windows taskbar at the bottom shows the date and time as 09:46 on 14-10-2023.

-- Retrieve Names of Registration Teams

SELECT Name

FROM Registration_Team;

Project Report x draw.io - Diagrams for Confluence x wer diagram w3 resource - Google x SQL Worksheet x +

livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::

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Home SQL Worksheet My Session Schema Quick SQL My Scripts My Tutorials Code Library

SQL Worksheet Clear Find Actions Save Run

```
182
183
184 SELECT hospital_name, hospital_location
185 FROM Hospital;
186
187
188 SELECT Name
189 FROM Registration_Team;
190
```

NAME
Team Alpha
Team Beta
Team Gamma

Download CSV

3 rows selected.

2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym
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28°C Sunny Search 09:47 14-10-2023

```
-- Find Patients by Blood Group and Gender
```

```
SELECT Name, Blood_group, Gender
```

```
FROM Patient
```

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

The screenshot displays the Oracle Live SQL web interface. The browser tabs include 'Project Report', 'draw.io - Diagrams for Confluence', 'wer diagram w3 resource - Google', and 'SQL Worksheet'. The address bar shows the URL: `livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::`. The page header features the 'Live SQL' logo, a 'Feedback' link, a 'Help' link, a user profile 'notrealdev2211@gmail.com', and a dark mode toggle. A left sidebar contains navigation links: 'Home', 'SQL Worksheet' (selected), 'My Session', 'Schema', 'Quick SQL', 'My Scripts', 'My Tutorials', and 'Code Library'. The main area is titled 'SQL Worksheet' and includes 'Clear', 'Find', 'Actions', 'Save', and 'Run' buttons. The SQL editor shows the following code:

```
187  
188 SELECT Name  
189 FROM Registration_Team;  
190  
191  
192 SELECT Name, Blood_group, Gender  
193 FROM Patient  
194 WHERE Blood_group = 'A-' AND Gender = 'Male';  
195
```

Below the editor, the results section displays 'no data found'. The footer indicates the version: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'. It also mentions 'Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the bottom shows the date '14-10-2023' and time '09:47'.

-- Calculate the Average Age of Donors

SELECT AVG(Age) AS Average_Age

FROM Donor;

The screenshot shows the Oracle Live SQL web interface. The browser address bar displays the URL: `livesql.oracle.com/apex/?p=590:1:17010430963790:LEVEL1::`. The interface includes a sidebar with navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled "SQL Worksheet" and contains the following SQL code:

```
191  
192 SELECT Name, Blood_group, Gender  
193 FROM Patient  
194 WHERE Blood_group = 'A-' AND Gender = 'Male';  
195  
196  
197 SELECT AVG(Age) AS Average_Age  
198 FROM Donor;  
199
```

Below the code editor, the result of the query is displayed in a table with one column, "AVERAGE_AGE", and one row with the value "38". A "Download CSV" button is located below the table. At the bottom of the interface, a status bar indicates: "2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym". The Windows taskbar at the bottom shows the date and time as 09:47 on 14-10-2023.

```
-- Count the Number of Blood Banks
```

```
SELECT COUNT(*) AS Number_of_Blood_Banks
```

```
FROM Blood_bank;
```

The screenshot displays the Oracle Live SQL web application. The browser's address bar shows the URL `livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::`. The application's header includes the 'Live SQL' logo, a user profile for 'notrealdev2211@gmail.com', and a dark mode toggle. A left-hand navigation menu contains links for Home, SQL Worksheet (which is active), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main content area, titled 'SQL Worksheet', contains a SQL query: `SELECT AVG(Age) AS Average_Age FROM Donor;` on line 197, and `SELECT COUNT(*) AS Number_of_Blood_Banks FROM Blood_bank;` on line 202. The query on line 202 is highlighted. Below the query editor, a result set is displayed with a single column header 'NUMBER_OF_BLOOD_BANKS' and a single row containing the value '3'. A 'Download CSV' button is located below the result set. At the bottom of the application, a footer provides version information: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'. The Windows taskbar at the very bottom shows the system clock as 09:48 on 14-10-2023, along with weather information (28°C Sunny) and various application icons.