

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.

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 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 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 text editor with the following SQL query:

```
162  
163  
164  
165  
166 SELECT Name, Blood_Group  
167 FROM Donor;  
168  
169  
170  
171
```

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

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

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 system tray at the bottom shows the date and time as '09:44 14-10-2023'.

-- 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 are displayed in a table with two columns: 'BLOOD_GROUP' and 'BLOOD_PACKAGE_ID'. The table contains four rows of data. 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'.

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

```
-- 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', '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 '14-10-2023' and time '09:45'.

-- 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:

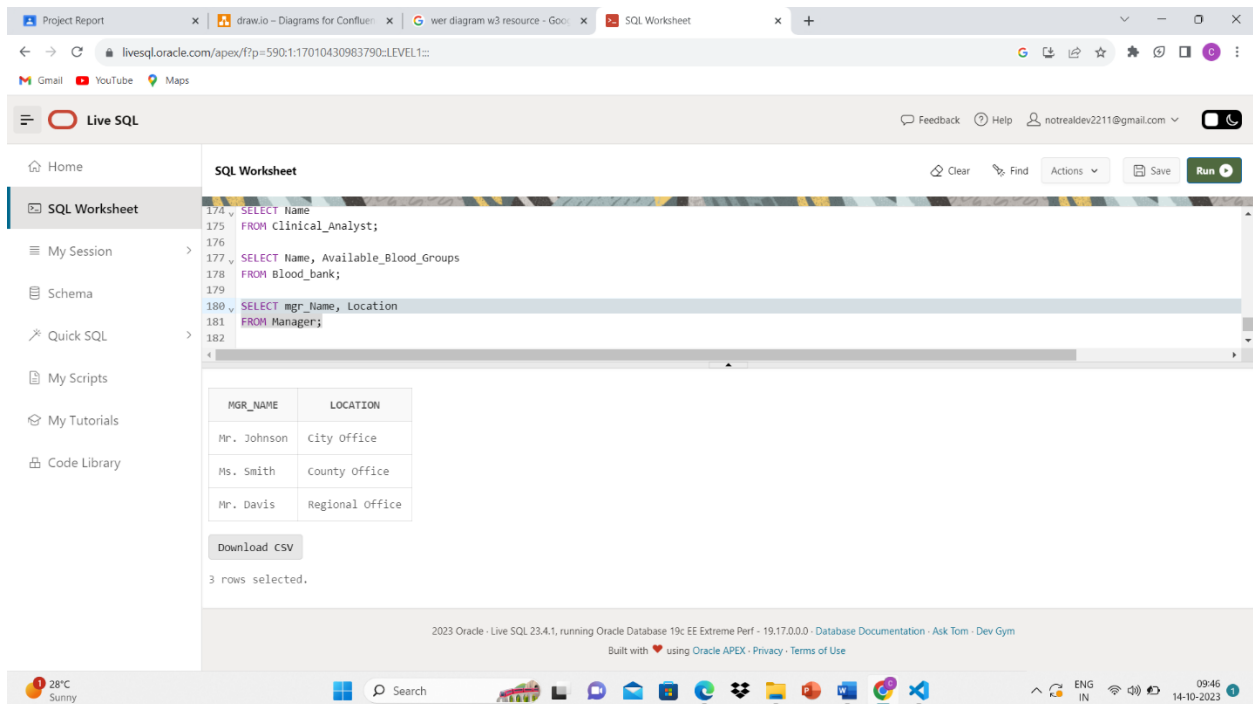
NAME	AVAILABLE_BLOOD_GROUPS
City Blood Bank	A+, B-, O+
County Blood Bank	B+, AB-, O-
Regional Blood Bank	A+, O+, AB-

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 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' and 'Built with using Oracle APEX - Privacy - Terms of Use'. The Windows taskbar at the bottom shows the date as 14-10-2023 and the time as 09:45.

-- Get the Name and Location of Managers

SELECT mgr_Name, Location

FROM Manager;



The screenshot shows the Oracle Live SQL web 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:

```
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
```

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

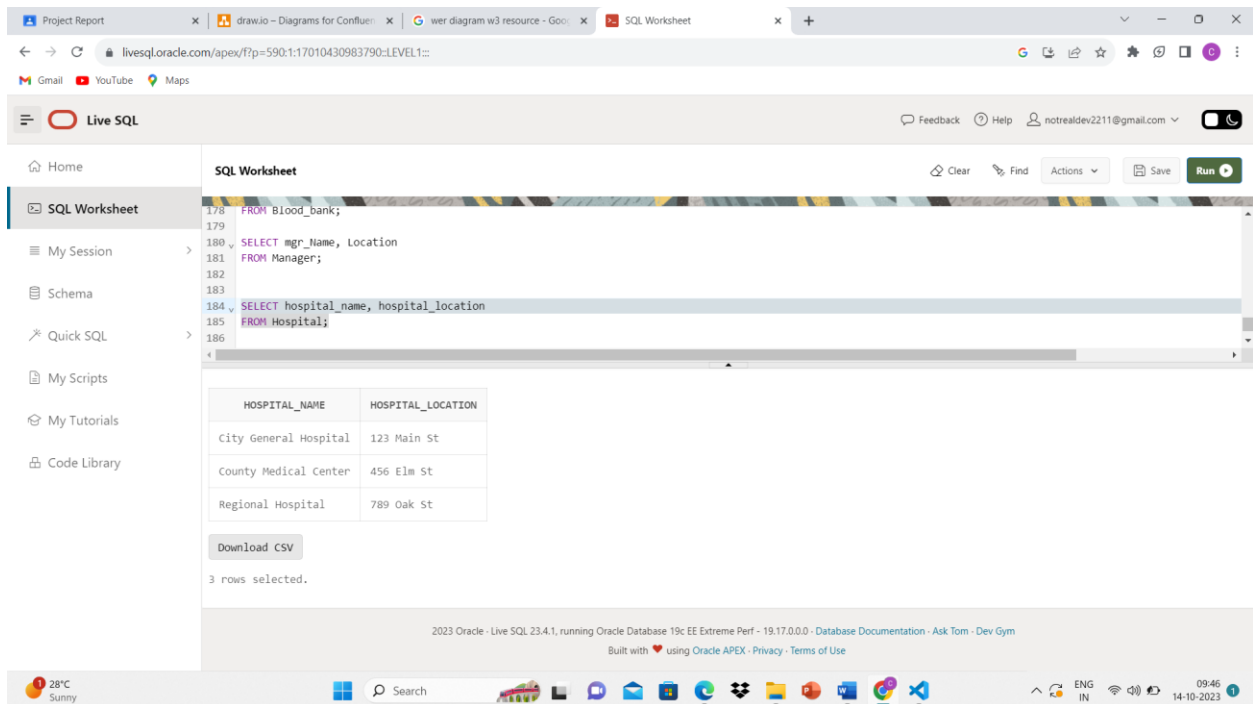
MGR_NAME	LOCATION
Mr. Johnson	City Office
Ms. Smith	County Office
Mr. Davis	Regional Office

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 indicating the version of Oracle Live SQL and the database being used.

-- List Hospitals and Their Locations

SELECT hospital_name, hospital_location

FROM Hospital;



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

```
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
```

The results of the query 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

Below the table, there is a "Download CSV" button and a message "3 rows selected." At the bottom of the interface, it says "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 as 14-10-2023 and the time as 09:46.

-- Retrieve Names of Registration Teams

SELECT Name

FROM Registration_Team;

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 the following SQL code:

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

Below the code editor, a results table is displayed with the following data:

NAME
Team Alpha
Team Beta
Team Gamma

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'.

```
-- 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 application interface. The browser's address bar shows the URL: `livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::`. The application header includes the 'Live SQL' logo, navigation links for 'Home', 'SQL Worksheet', 'My Session', 'Schema', 'Quick SQL', 'My Scripts', 'My Tutorials', and 'Code Library'. The 'SQL Worksheet' section is active, showing a query editor with the following SQL 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 query editor, the results pane displays 'no data found'. The footer of the application 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 bottom shows the system clock as 09:47 on 14-10-2023, with a temperature of 28°C and a 'Sunny' weather forecast.

-- 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 a SQL query:

```
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 query editor, the results are displayed in a table with one column, "AVERAGE_AGE", and one row with the value "38". A "Download CSV" button is located below the results 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 interface. The browser's address bar shows the URL: `livesql.oracle.com/apex/f?p=590:1:17010430963790::LEVEL1::`. The application 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 the active tab), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main content area, titled 'SQL Worksheet', contains a SQL query: `SELECT COUNT(*) AS Number_of_Blood_Banks FROM Blood_bank;`. Below the query editor, the result is displayed as a table with one column, 'NUMBER_OF_BLOOD_BANKS', and one row containing the value '3'. A 'Download CSV' button is located below the result table. At the bottom of the interface, a footer provides information about the Oracle Live SQL version (23.4.1) and the underlying Oracle Database (19c EE Extreme Perf - 19.17.0.0.0). 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.