CSD 317 : Introduction to Database Systems

Project Report: COVID19- Vaccination Tracking System

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Project Description

This project focuses on building a **COVID-19 Vaccination Tracking System**, a database-driven application designed to manage vaccination records, citizen health data, vaccine distribution, and real-time monitoring. The system provides functionalities for:

- **Citizen registration & priority group classification**
- **Vaccination scheduling & dose tracking**
- **Vaccination center management & inventory control**
- **Health monitoring & certificate generation**
- **Analytics dashboards for government and healthcare officials**

The system ensures **data security, privacy, and real-time reporting** to support pandemic response efforts.

Technologies Used

- **Backend**: MySQL (Relational Database)
- **API Integration**: (Optional) Government ID verification APIs (e.g., Aadhaar/Passport validation)
- **Analytics**: SQL Views & Stored Procedures for real-time reporting

Features

1. Citizen Registration & Management

- Secure registration with **name, age, gender, ID proof, address, and medical history**.
- Priority classification (e.g., senior citizens, frontline workers).

- **Multi-factor authentication** for sensitive data access.

2. Vaccination Scheduling & Tracking

- **Appointment booking** with preferred vaccination centers.
- **Dose tracking** (1st, 2nd, booster) with reminders.
- Batch number and vaccine type (Covishield, Covaxin, etc.) tracking.

3. Vaccination Center Management

- **Center details** (location, capacity, working hours).
- **Real-time slot availability** based on inventory.
- **Staff assignment & workload tracking**.

4. Vaccine Inventory & Distribution

- **Stock management** (received, used, expired doses).
- **Distribution logs** from central warehouses to regional centers.

5. Health Monitoring & Reporting

- **Post-vaccination symptom tracking**.
- **COVID test result integration**.
- **High-risk case flagging**.

6. Certificate Generation

- **Digital certificates with QR codes** after full vaccination.
- **Verification system** for authenticity checks.

7. Analytics & Dashboards

- **Vaccination rates by region**.
- **Infection vs. vaccination trends**.
- **Demographic coverage reports**.

8. Security & Privacy

- **Role-based access control** (Admin, Healthcare Worker, Citizen).
- **Encryption** for sensitive data (Aadhaar, medical records).
- **Audit logs** for all data modifications.

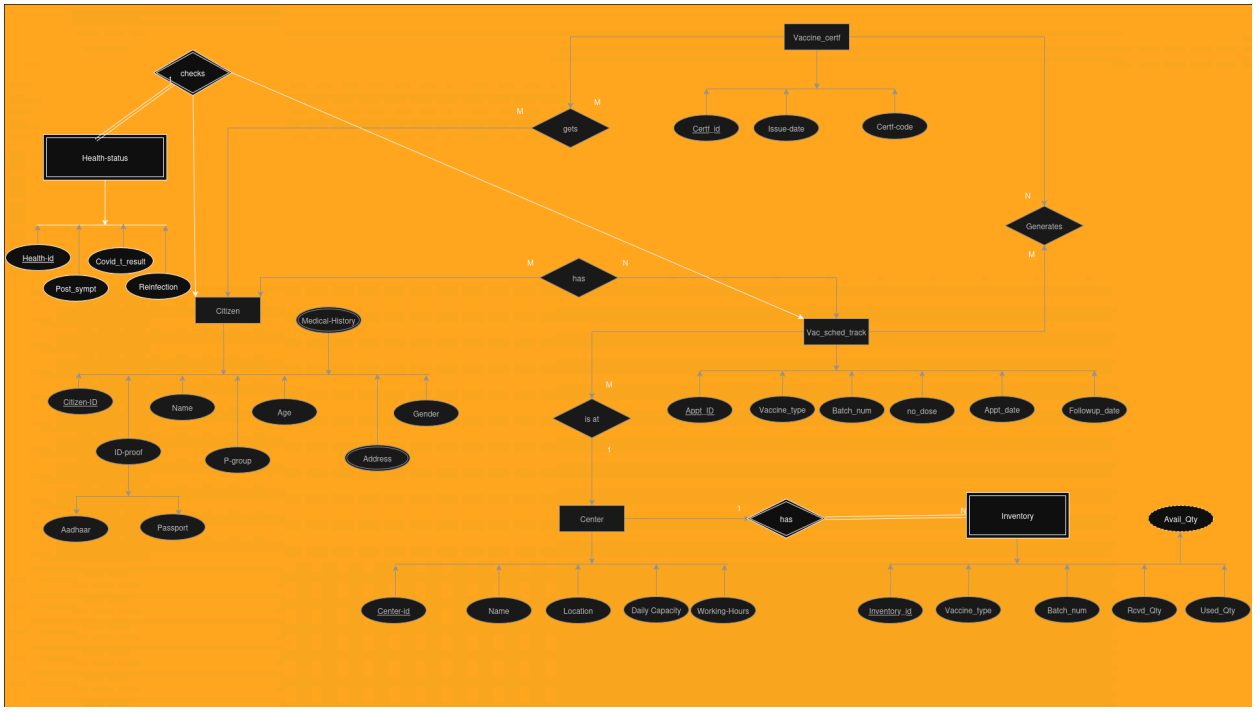
Limitations

- **No direct integration with government health portals** (manual data entry required).
- **No real-time SMS/email notification system** (currently relies on backend logs).
- **Limited mobile accessibility** (optimized for desktop use).

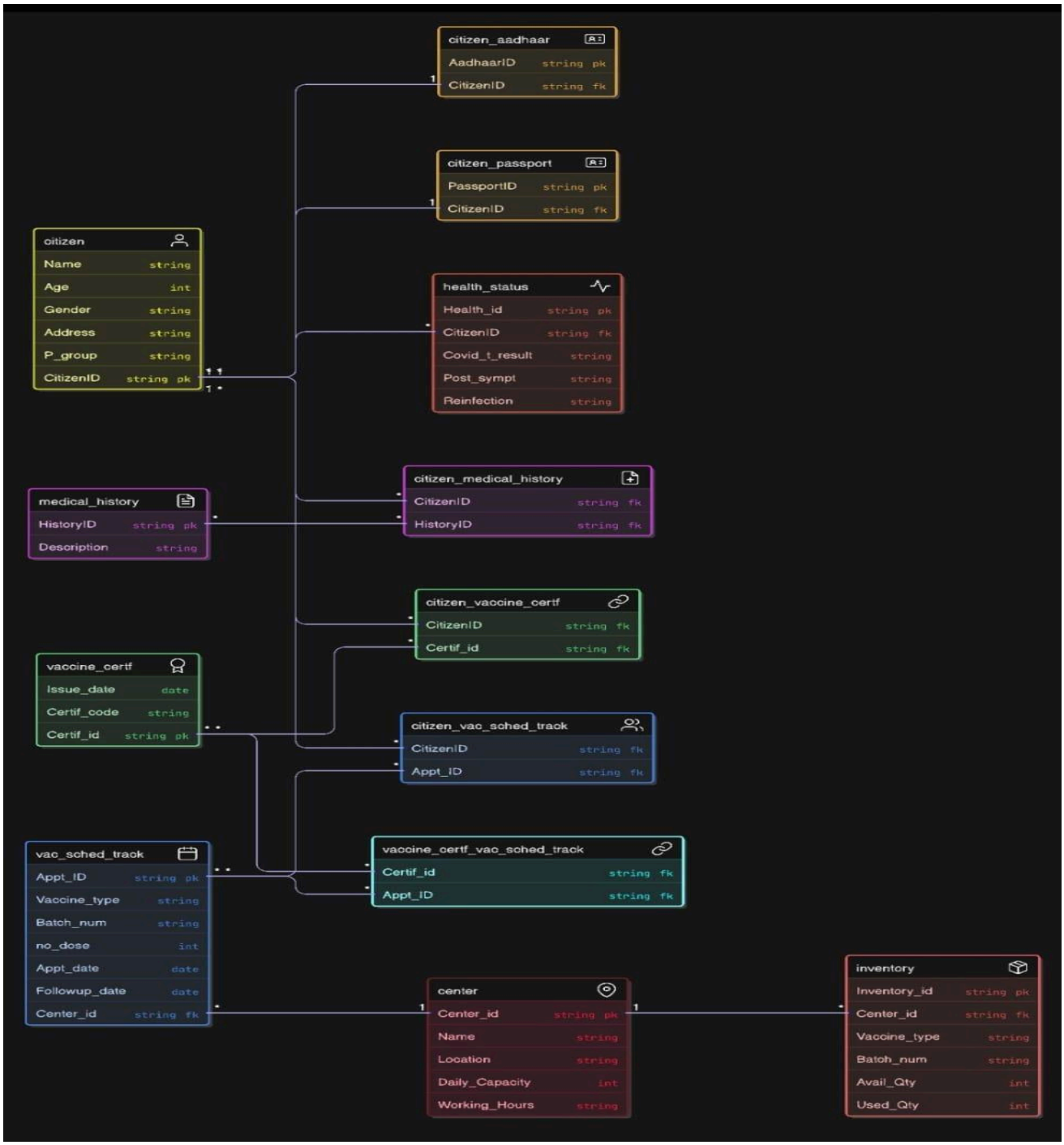
Future Scope

1. **Web & Mobile App Integration** – Expand accessibility for citizens and admins.
2. **Automated Government Data Sync** – Reduce manual entry via API integrations.
3. **Real-Time Alerts** – SMS/email notifications for appointments and dose reminders.
4. **AI-Powered Risk Prediction** – Analyze health data to flag high-risk individuals.
5. **Blockchain for Certificate Security** – Prevent forgery of vaccination records.

ER DIAGRAM


Vaccine_certf
checks
gets
Certf_id
Issue-date
Certf-code
Health-status
Generates
Health-id
Covid_t_result
Post_sympt
Reinfection
has
Citizen
Medical-History
Vac_sched_track
Citizen-ID
Name
Age
Gender
Is at
Appt_ID
Vaccine_type
Batch_num
no_dose
Appt_date
Followup_date
ID-proof
P-group
Address
Center
has
Inventory
Avail_Qty
Aadhaar
Passport
Center-id
Name
Location
Daily Capacity
Working-Hours
Inventory_id
Vaccine_type
Batch_num
Rcvd_Qty
Used_Qty

Relational Model Diagram



Final Tables after Normalization

1. Citizens Table

```
mysql> desc citizen;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| Name       | varchar(50)  | YES  |     | NULL    |       |
| Age        | int          | YES  |     | NULL    |       |
| Gender     | varchar(10)  | YES  |     | NULL    |       |
| Address    | text         | YES  |     | NULL    |       |
| P_group    | varchar(50)  | YES  |     | NULL    |       |
| CitizenID  | varchar(100) | NO   | PRI | NULL    |       |
| ID_proof   | varchar(10)  | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

2. Vaccination_Sched_and_Track Table

```
mysql> desc vac_sched_track;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| Appt_ID       | varchar(50) | NO   | PRI | NULL    |       |
| Vaccine_type  | varchar(30) | YES  |     | NULL    |       |
| Batch_num     | varchar(30) | YES  |     | NULL    |       |
| no_dose       | int         | YES  |     | NULL    |       |
| Appt_date     | date        | YES  |     | NULL    |       |
| Followup_date | date        | YES  |     | NULL    |       |
| Center_ID     | varchar(50) | YES  | MUL | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

3. Vaccination Centers Table

```
mysql> desc center;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| Center_id     | varchar(50) | NO   | PRI | NULL    |       |
| Name          | varchar(60) | YES  |     | NULL    |       |
| Location      | varchar(50) | YES  |     | NULL    |       |
| Daily_Capacity | int        | YES  |     | NULL    |       |
| Working_Hours | varchar(40) | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

4. Inventory

```
mysql> desc inventory;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Inventory_id | varchar(50) | NO   | PRI | NULL    |       |
| Vaccine_type | varchar(50) | YES  |     | NULL    |       |
| Batch_num   | varchar(50) | YES  |     | NULL    |       |
| Avail_Qty   | int         | YES  |     | NULL    |       |
| Used_Qty    | int         | YES  |     | NULL    |       |
| Center_id   | varchar(50) | YES  | MUL | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

5. Medical_History

```
mysql> desc medical_history;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| HistoryID   | varchar(60)  | NO   | PRI | NULL    |       |
| Description | varchar(100) | YES  |     | NULL    |       |
| CitizenID   | varchar(100) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

6. Health Status

```
mysql> desc health_status;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| Health_id      | varchar(60) | NO   | PRI | NULL    |       |
| Covid_t_result | varchar(50) | YES  |     | NULL    |       |
| Post_Sympt     | text        | YES  |     | NULL    |       |
| Reinfection    | varchar(70) | YES  |     | NULL    |       |
| CitizenID      | varchar(100)| YES  | MUL | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

7. Vaccine Certificate

```
mysql> desc vaccine_certif
    -> ;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| issue_date  | date        | YES  |     | NULL    |       |
| Certif_code | varchar(60) | YES  |     | NULL    |       |
| Certif_id   | varchar(50) | NO   | PRI | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
3 rows in set (0.01 sec)

mysql> desc citizen_vaccine_certif;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| CitizenID | varchar(100)| YES  | MUL | NULL    |       |
| Certif_id | varchar(50) | YES  | MUL | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
2 rows in set (0.01 sec)
```

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```
mysql> select * from center;
+-----------+-----------------+------------+---------------+--------------+
| Center_id | Name            | Location   | Daily_Capacity | Working_Hours |
+-----------+-----------------+------------+---------------+--------------+
| CTR001    | AIIMS Delhi     | Delhi      |           500 | 08:00-20:00  |
| CTR002    | KEM Hospital    | Mumbai     |           400 | 09:00-17:00  |
| CTR003    | Apollo Chennai  | Chennai    |           350 | 09:00-18:00  |
| CTR004    | NIMS Hyderabad  | Hyderabad  |           300 | 08:30-17:30  |
| CTR005    | CMC Vellore     | Vellore    |           320 | 09:00-19:00  |
| CTR006    | PGI Chandigarh  | Chandigarh |           450 | 08:00-20:00  |
| CTR007    | RML Delhi       | Delhi      |           500 | 08:00-20:00  |
| CTR008    | Fortis Noida    | Noida      |           400 | 09:00-17:00  |
| CTR009    | Medanta Gurgaon | Gurgaon    |           450 | 08:30-19:00  |
| CTR010    | Max Patna       | Patna      |           300 | 09:00-17:00  |
| CTR011    | Sunrise Hospital| Bangalore  |           350 | 08:30-17:30  |
| CTR012    | Care Hospitals  | Nagpur     |           300 | 09:00-18:00  |
| CTR013    | Seven Hills     | Mumbai     |           500 | 08:00-20:00  |
| CTR014    | Apex Hospital   | Jaipur     |           250 | 08:00-17:00  |
| CTR015    | Park Hospital   | Rohtak     |           200 | 09:00-17:00  |
| CTR016    | Ranchi Medical  | Ranchi     |           220 | 09:00-18:00  |
| CTR017    | JIPMER Pondy    | Pondicherry|           280 | 08:30-17:30  |
| CTR018    | ESIC Kolkata    | Kolkata    |           300 | 09:00-19:00  |
| CTR019    | Lohia Lucknow   | Lucknow    |           260 | 09:00-17:00  |
| CTR020    | RIMS Imphal     | Imphal     |           270 | 08:00-18:00  |
| CTR021    | GMCH Guwahati   | Guwahati   |           230 | 08:30-17:00  |
| CTR022    | AIIMS Bhopal    | Bhopal     |           320 | 09:00-17:00  |
| CTR023    | AIIMS Rishikesh | Rishikesh  |           300 | 09:00-19:00  |
| CTR024    | SMS Hospital    | Jaipur     |           400 | 08:00-20:00  |
| CTR025    | Medical College | Amritsar   |           280 | 09:00-17:00  |
| CTR026    | SCT Trivandrum  | Trivandrum |           250 | 09:00-17:30  |
| CTR027    | KGMU            | Lucknow    |           300 | 09:00-18:00  |
| CTR028    | DY Patil Pune   | Pune       |           350 | 08:30-19:00  |
| CTR029    | IGMC Shimla     | Shimla     |           200 | 09:00-17:00  |
| CTR030    | Nehru Hospital  | Pune       |           240 | 08:30-17:30  |
+-----------+-----------------+------------+---------------+--------------+
30 rows in set (0.01 sec)
```

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```
mysql> select * from citizen;
+---------------+------+--------+-------------------+-----------------+-----------+------------+
| Name          | Age  | Gender | Address           | P_group         | CitizenID | ID_proof   |
+---------------+------+--------+-------------------+-----------------+-----------+------------+
| Anjali Sharma |   65 | Female | Delhi             | Senior Citizen  | CIT001    | ADH96209HR |
| Raj Verma     |   42 | Male   | Mumbai            | Frontline Worker| CIT002    | PAS46408GJ |
| Sita Reddy    |   29 | Female | Hyderabad         | General         | CIT003    | ADH15865WB |
| Mohit Jain    |   33 | Male   | Bangalore         | General         | CIT004    | PAS83773KA |
| Farhan Khan   |   72 | Male   | Lucknow           | Senior Citizen  | CIT005    | ADH48914HR |
| Divya Mehta   |   58 | Female | Chennai           | General         | CIT006    | PAS75403KA |
| Pooja Iyer    |   24 | Female | Kolkata           | General         | CIT007    | ADH92434PB |
| Arun Sinha    |   49 | Male   | Patna             | Frontline Worker| CIT008    | PAS77624DL |
| Meera Nair    |   60 | Female | Kochi             | Senior Citizen  | CIT009    | ADH42949WB |
| Nikhil Bansal |   34 | Male   | Noida             | General         | CIT010    | PAS17421GJ |
| Amit Rao      |   45 | Male   | Bhopal            | Frontline Worker| CIT011    | ADH44456HR |
| Priya Das     |   38 | Female | Guwahati          | General         | CIT012    | PAS87879HR |
| Tanya Aggarwal|   52 | Female | Jaipur            | General         | CIT013    | ADH69597HR |
| Zoya Malik    |   63 | Female | Srinagar          | Senior Citizen  | CIT014    | PAS31431PB |
| Rakesh Singh  |   27 | Male   | Amritsar          | General         | CIT015    | ADH70822GJ |
| Simran Kapoor |   30 | Female | Chandigarh        | General         | CIT016    | PAS62744HR |
| Saurabh Mishra|   40 | Male   | Indore            | General         | CIT017    | ADH54743MH |
| Ritu Joshi    |   36 | Female | Surat             | General         | CIT018    | PAS75429UP |
| Imran Khan    |   70 | Male   | Nagpur            | Senior Citizen  | CIT019    | ADH40472RJ |
| Anita George  |   59 | Female | Thiruvananthapuram| General         | CIT020    | PAS90108KA |
| Karan Arora   |   41 | Male   | Pune              | Frontline Worker| CIT021    | ADH47815WB |
| Madhuri Rao   |   66 | Female | Vijayawada        | Senior Citizen  | CIT022    | PAS97519HR |
| Ravi Sekhar   |   55 | Male   | Visakhapatnam     | General         | CIT023    | ADH22535WB |
| Neha Kulkarni |   26 | Female | Nashik            | General         | CIT024    | PAS50495WB |
| Alok Singh    |   47 | Male   | Gaya              | Frontline Worker| CIT025    | ADH56601PB |
| Kritika Dey   |   43 | Female | Agartala          | General         | CIT026    | PAS20963DL |
| Arvind Patil  |   60 | Male   | Kolhapur          | Senior Citizen  | CIT027    | ADH88889DL |
| Sunita Kumari |   64 | Female | Ranchi            | Senior Citizen  | CIT028    | PAS00229WB |
| Yusuf Ali     |   32 | Male   | Jammu             | General         | CIT029    | ADH04353TN |
| Nidhi Saxena  |   29 | Female | Ghaziabad         | General         | CIT030    | PAS80659HR |
+---------------+------+--------+-------------------+-----------------+-----------+------------+
30 rows in set (0.01 sec)
```

```
mysql> select * from citizen_vaccine_certif;
+-----------+-----------+
| CitizenID | Certif_id |
+-----------+-----------+
| CIT001    | CERT001   |
| CIT002    | CERT002   |
| CIT003    | CERT003   |
| CIT004    | CERT004   |
| CIT005    | CERT005   |
| CIT006    | CERT006   |
| CIT007    | CERT007   |
| CIT008    | CERT008   |
| CIT009    | CERT009   |
| CIT010    | CERT010   |
+-----------+-----------+
10 rows in set (0.00 sec)
```

```
mysql> select * from health_status;
+-----------+----------------+-----------------+-------------+-----------+
| Health_id | Covid_t_result | Post_Sympt      | Reinfection | CitizenID |
+-----------+----------------+-----------------+-------------+-----------+
| HS001     | Negative       | None            | No          | CIT001    |
| HS002     | Negative       | Fever           | No          | CIT002    |
| HS003     | Positive       | Cough           | Yes         | CIT003    |
| HS004     | Negative       | None            | No          | CIT004    |
| HS005     | Positive       | Breathlessness  | Yes         | CIT005    |
| HS006     | Negative       | Headache        | No          | CIT006    |
| HS007     | Negative       | Fatigue         | No          | CIT007    |
| HS008     | Negative       | None            | No          | CIT008    |
| HS009     | Positive       | Fever and Cough | Yes         | CIT009    |
| HS010     | Negative       | None            | No          | CIT010    |
| HS011     | Negative       | Mild fever      | No          | CIT011    |
| HS012     | Negative       | Cold            | No          | CIT012    |
| HS013     | Negative       | None            | No          | CIT013    |
| HS014     | Negative       | Body pain       | No          | CIT014    |
| HS015     | Negative       | None            | No          | CIT015    |
| HS016     | Positive       | Cough           | Yes         | CIT016    |
| HS017     | Negative       | Headache        | No          | CIT017    |
| HS018     | Negative       | Sore throat     | No          | CIT018    |
| HS019     | Negative       | Fatigue         | No          | CIT019    |
| HS020     | Negative       | None            | No          | CIT020    |
| HS021     | Negative       | Cold            | No          | CIT021    |
| HS022     | Positive       | Fever           | Yes         | CIT022    |
| HS023     | Negative       | None            | No          | CIT023    |
| HS024     | Negative       | Headache        | No          | CIT024    |
| HS025     | Negative       | None            | No          | CIT025    |
| HS026     | Negative       | None            | No          | CIT026    |
| HS027     | Positive       | Fever           | Yes         | CIT027    |
| HS028     | Negative       | None            | No          | CIT028    |
| HS029     | Negative       | Cold            | No          | CIT029    |
| HS030     | Negative       | None            | No          | CIT030    |
+-----------+----------------+-----------------+-------------+-----------+
30 rows in set (0.00 sec)
```

```
mysql> select * from inventory;
+--------------+--------------+-----------+-----------+----------+-----------+
| Inventory_id | Vaccine_type | Batch_num | Avail_Qty | Used_Qty | Center_id |
+--------------+--------------+-----------+-----------+----------+-----------+
| INV001       | Covishield   | B01       |      1000 |      600 | CTR001    |
| INV002       | Covaxin      | B02       |       800 |      500 | CTR002    |
| INV003       | Covishield   | B03       |      1200 |      700 | CTR003    |
| INV004       | Covaxin      | B04       |       900 |      450 | CTR004    |
| INV005       | Covishield   | B05       |       850 |      400 | CTR005    |
| INV006       | Covaxin      | B06       |       750 |      350 | CTR006    |
| INV007       | Covishield   | B07       |      1000 |      600 | CTR007    |
| INV008       | Covaxin      | B08       |      1100 |      800 | CTR008    |
| INV009       | Covishield   | B09       |       950 |      550 | CTR009    |
| INV010       | Covaxin      | B10       |      1050 |      700 | CTR010    |
| INV011       | Covishield   | B11       |       990 |      490 | CTR011    |
| INV012       | Covaxin      | B12       |       890 |      480 | CTR012    |
| INV013       | Covishield   | B13       |      1020 |      620 | CTR013    |
| INV014       | Covaxin      | B14       |       870 |      470 | CTR014    |
| INV015       | Covishield   | B15       |       920 |      510 | CTR015    |
| INV016       | Covaxin      | B16       |       800 |      440 | CTR016    |
| INV017       | Covishield   | B17       |       960 |      560 | CTR017    |
| INV018       | Covaxin      | B18       |      1040 |      660 | CTR018    |
| INV019       | Covishield   | B19       |       980 |      590 | CTR019    |
| INV020       | Covaxin      | B20       |       940 |      620 | CTR020    |
| INV021       | Covishield   | B21       |       950 |      640 | CTR021    |
| INV022       | Covaxin      | B22       |       880 |      460 | CTR022    |
| INV023       | Covishield   | B23       |       910 |      570 | CTR023    |
| INV024       | Covaxin      | B24       |       870 |      480 | CTR024    |
| INV025       | Covishield   | B25       |       940 |      510 | CTR025    |
| INV026       | Covaxin      | B26       |       920 |      495 | CTR026    |
| INV027       | Covishield   | B27       |       930 |      490 | CTR027    |
| INV028       | Covaxin      | B28       |       880 |      475 | CTR028    |
| INV029       | Covishield   | B29       |       910 |      520 | CTR029    |
| INV030       | Covaxin      | B30       |       925 |      505 | CTR030    |
+--------------+--------------+-----------+-----------+----------+-----------+
30 rows in set (0.00 sec)
```

```
mysql> select * from medical_history;
+-----------+------------------+-----------+
| HistoryID | Description      | CitizenID |
+-----------+------------------+-----------+
| MH001     | Diabetes         | CIT001    |
| MH002     | Hypertension     | CIT002    |
| MH003     | Heart Disease    | CIT003    |
| MH004     | Asthma           | CIT004    |
| MH005     | Obesity          | CIT005    |
| MH006     | Cancer           | CIT006    |
| MH007     | Thyroid          | CIT007    |
| MH008     | Arthritis        | CIT008    |
| MH009     | Liver Disease    | CIT009    |
| MH010     | Kidney Disease   | CIT010    |
| MH011     | Anemia           | CIT011    |
| MH012     | Allergies        | CIT012    |
| MH013     | Tuberculosis     | CIT013    |
| MH014     | Lung Infection   | CIT014    |
| MH015     | Migraines        | CIT015    |
| MH016     | Depression       | CIT016    |
| MH017     | Seizure          | CIT017    |
| MH018     | Hepatitis        | CIT018    |
| MH019     | Chronic Fatigue  | CIT019    |
| MH020     | Skin Disorders   | CIT020    |
| MH021     | Mental Health    | CIT021    |
| MH022     | Parkinson's      | CIT022    |
| MH023     | Stroke           | CIT023    |
| MH024     | Ulcers           | CIT024    |
| MH025     | Epilepsy         | CIT025    |
| MH026     | High Cholesterol | CIT026    |
| MH027     | HIV/AIDS         | CIT027    |
| MH028     | Autoimmune       | CIT028    |
| MH029     | Blood Pressure   | CIT029    |
| MH030     | Sleep Apnea      | CIT030    |
+-----------+------------------+-----------+
30 rows in set (0.00 sec)
```

```
30 rows in set (0.00 sec)

mysql> select * from vac_sched_track;
+---------+--------------+-----------+---------+------------+--------------+-----------+
| Appt_ID | Vaccine_type | Batch_num | no_dose | Appt_date  | Followup_date | Center_ID |
+---------+--------------+-----------+---------+------------+--------------+-----------+
| APT001  | Covishield   | B01       |       1 | 2025-07-01 | 2025-08-01    | CTR001    |
| APT002  | Covaxin      | B02       |       1 | 2025-07-02 | 2025-08-02    | CTR002    |
| APT003  | Covishield   | B03       |       1 | 2025-07-03 | 2025-08-03    | CTR003    |
| APT004  | Covaxin      | B04       |       1 | 2025-07-04 | 2025-08-04    | CTR004    |
| APT005  | Covishield   | B05       |       1 | 2025-07-05 | 2025-08-05    | CTR005    |
| APT006  | Covaxin      | B06       |       1 | 2025-07-06 | 2025-08-06    | CTR006    |
| APT007  | Covishield   | B07       |       1 | 2025-07-07 | 2025-08-07    | CTR007    |
| APT008  | Covaxin      | B08       |       1 | 2025-07-08 | 2025-08-08    | CTR008    |
| APT009  | Covishield   | B09       |       1 | 2025-07-09 | 2025-08-09    | CTR009    |
| APT010  | Covaxin      | B10       |       1 | 2025-07-10 | 2025-08-10    | CTR010    |
+---------+--------------+-----------+---------+------------+--------------+-----------+
10 rows in set (0.00 sec)

mysql> select * from vaccine_certif;
+------------+-------------+-----------+
| issue_date | Certif_code | Certif_id |
+------------+-------------+-----------+
| 2025-08-01 | QR001       | CERT001   |
| 2025-08-02 | QR002       | CERT002   |
| 2025-08-03 | QR003       | CERT003   |
| 2025-08-04 | QR004       | CERT004   |
| 2025-08-05 | QR005       | CERT005   |
| 2025-08-06 | QR006       | CERT006   |
| 2025-08-07 | QR007       | CERT007   |
| 2025-08-08 | QR008       | CERT008   |
| 2025-08-09 | QR009       | CERT009   |
| 2025-08-10 | QR010       | CERT010   |
+------------+-------------+-----------+
10 rows in set (0.00 sec)
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MySQL Table Queries :

create table citizen(Name VARCHAR(50),Age INT, Gender VARCHAR(10),Address TEXT,P_group VARCHAR(50),CitizenID VARCHAR(100) PRIMARY KEY);

create table health_status(Health_id VARCHAR(60) PRIMARY KEY,Covid_t_result VARCHAR(50),Post_Sympt TEXT,Reinfection VARCHAR(70),CitizenID VARCHAR(100), FOREIGN KEY(CitizenID) REFERENCES citizen(CitizenID));

create table medical_history(HistoryID VARCHAR(60) PRIMARY KEY,Description VARCHAR(100));

```
create table vaccine_certif(issue_date DATE,Certif_code VARCHAR(60),Certif_id VARCHAR(50) PRIMARY KEY);

create table citizen_vaccine_certif(CitizenID VARCHAR(100),Certif_id VARCHAR(50),FOREIGN KEY(CitizenID) REFERENCES citizen(CitizenID),FOREIGN KEY(Certif_id) REFERENCES vaccine_certif(Certif_id));

create table center(Center_id VARCHAR(50) PRIMARY KEY,Name VARCHAR(60),Location VARCHAR(50),Daily_Capacity INT,Working_Hours VARCHAR(40));

create table vac_sched_track(Appt_ID VARCHAR(50) PRIMARY KEY,Vaccine_type VARCHAR(30),Batch_num VARCHAR(30),no_dose INT,Appt_date DATE,Followup_date DATE,Center_ID VARCHAR(50),FOREIGN KEY(Center_ID) REFERENCES center(Center_ID));

create table vaccine_certif_vac_sched_track(Certif_id VARCHAR(50),Appt_ID VARCHAR(50),FOREIGN KEY(Certif_id) REFERENCES citizen_vaccine_certif(Certif_id),FOREIGN KEY(Appt_ID) REFERENCES vac_sched_track(Appt_ID));

create table inventory(Inventory_id VARCHAR(50) PRIMARY KEY,Vaccine_type VARCHAR(50),Batch_num VARCHAR(50),Avail_Qty INT,Used_Qty INT,Center_id VARCHAR(50),FOREIGN KEY(Center_id) REFERENCES center(Center_id));
```