

MINECRAFT HOSPITAL

SQL

OBJECTIVE:



**Row-Level
Security
(RLS)**



**Mandatory
Access
Control
(MAC)**



**Role-
Based
Access
Control
(MAC)**



Auditing



**Backup
and
Recovery**

CONTENT INDEX

1

PostgreSQL vs SQLite
Comparison, challenges, middleware

2

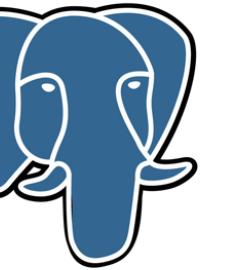
Database Schema
Tables, relationships, and attribute details

3

Security Summary
Roles, permissions, policies, cypher

5

Demo

		
INSERT / UPDATE / DELETE	✓	✓
Read / SELECT	✓	✓
Foreign Keys	✓	✓
Views	✓	✓
Triggers	✓	✓
Row-Level Security (RLS)	✓	✗
Users & Roles	✓	✗
Access Control (GRANT/REVOKE)	✓	✗
Encryption at Rest (Native)	✓	✗
Encryption in Transit (TLS)	✓	✗
Backup (Native)	✓	✓
Replication	✓	✗
High Concurrency Writes	✓	✗
JSON Support	✓	✗
Auditing (Native)	✓	✗
MAC (Mandatory Access Control)	✗	✗
Background Jobs	✓	✗
Scheduling (cron-like)	✓	✗
HTTP / API Exposure	✗	✗



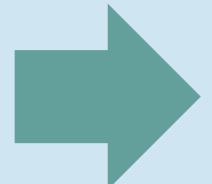
MIDDLEWARE



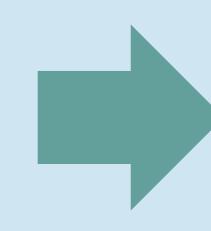
python



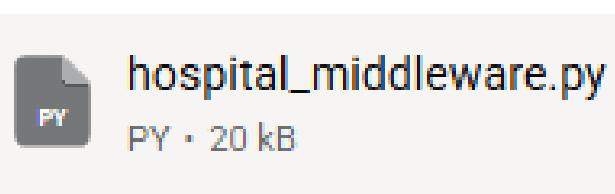
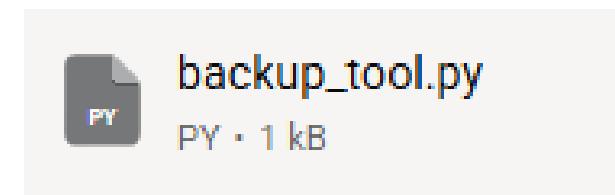
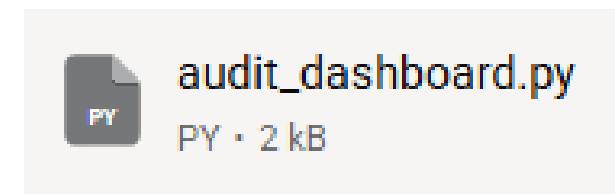
SQLite



python



SQLite



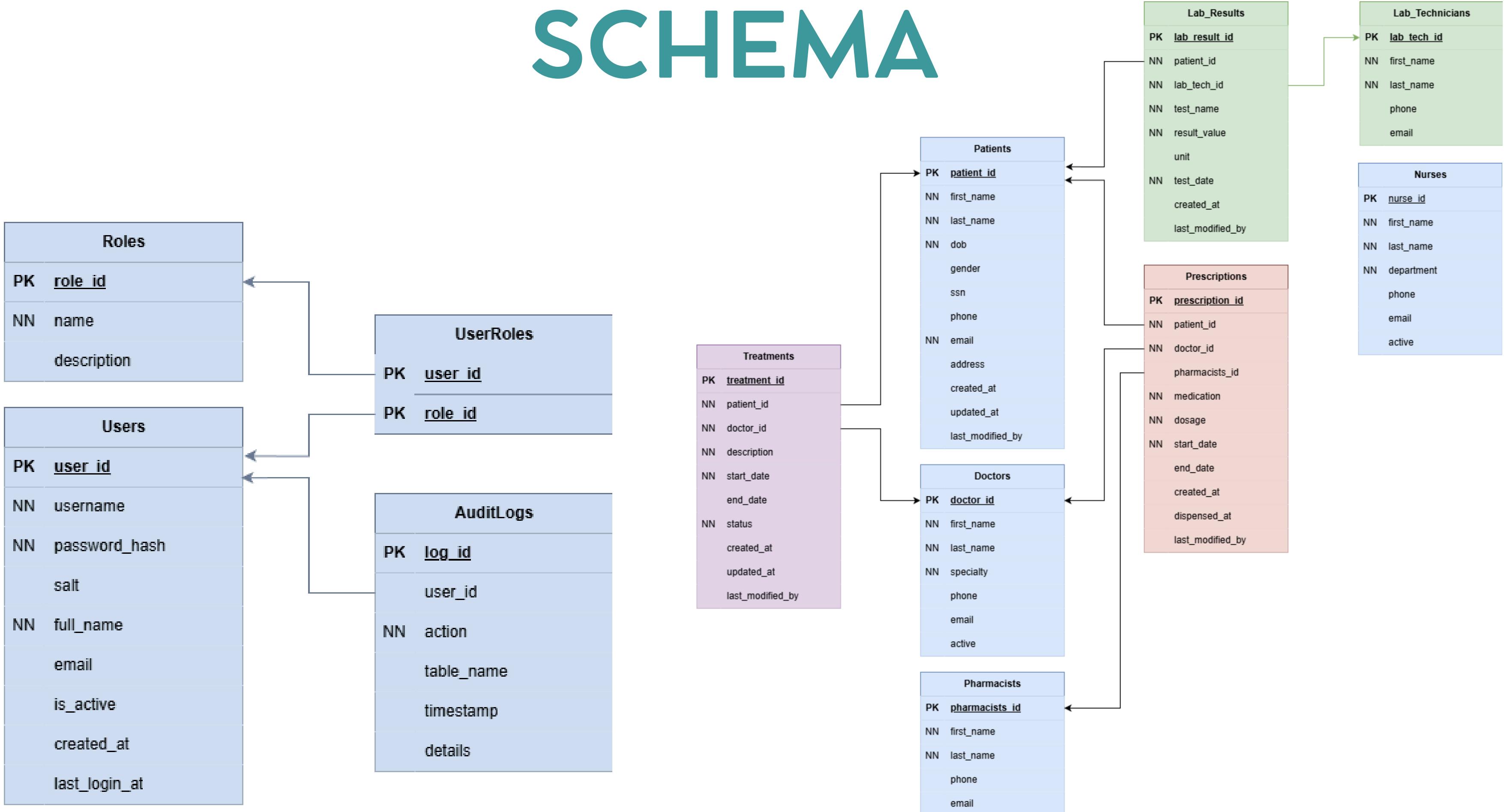
Encrypt/Decrypt
Check for permissions
Backup

...



INSERT INTO...
SELECT * FROM...

SCHEMA



SECURITY POLICIES

RBAC, RLS, Column-level

RBAC	Users / Roles / UserRoles
"MAC" (infrastructure design)	Hard-coded reference monitor
RLS	Patient self-only
Column security	SSN masking
Separation of duties	Admin ≠ Auditor ≠ Clinician
Immutable auditing and backup	auditor, etl_service respectively
Least privilege	Default deny

ROLES



Can Read	Patients, Treatments, Prescriptions, LabResults	Patients (masked), Prescriptions	Prescriptions	LabResults
Can Write	Treatments, Prescriptions	No	No	LabResults
Can Create/Delete Users	No	No	No	No
Special MAC / RLS Behavior	Full SSN, full medical history	SSN masked, no diagnosis	Drug-only access	Lab-only access

ROLES



Can Read	Users, Roles, UserRoles	AuditLogs	Own Patients row only	AuditLogs
Can Write	Users, Roles, UserRoles	No	No	No
Create/Delete Users	Yes	No	No	No
Special MAC / RLS Behavior	Cannot see ANY patient or audit data	Cannot see ANY other data	RLS: self-only	Backup / Restore authority. Cannot see ANY clinical data

BACKUP / AUDITING



etl_service



backup_tool.py
PY • 1 kB



auditor



audit_dashboard.py
PY • 2 kB

Executes SQLite online hot backups
Creates timestamped immutable backup copies
Does NOT stop the hospital system
Ensures consistent backups even during active writes

Backup policy:

Automated daily backups (e.g., 02:00 AM)

30-day rolling retention

Backups stored in isolated directory

Only etl_service may execute restore/export

Aggregates security logs from AuditLogs

Detects:

Unauthorized access attempts

Login failures

Clinical data reads

Displays:

Access count per role

Recent security violations

Last clinical accesses (who / what / when)



DEATH

THE X FILES

THE X FILES