Data Admin Concepts and Database Management

IST 659

Project Report

Smart Watch Based Hospital Management System

Submitted By

Abhishek Shinde

NETID: ashinde

Austin Rodrigues

NETID: arodr173

Neha Chandrakant Sharma

NETID: ncsharma

Prakruti Pruthvi Kumar

NETID: ppruthvi

Under the guidance of

Prof. Aaron Miller

Professor

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Introduction:

In the context of our rapidly evolving technological landscape, where innovation is poised to reshape various facets of healthcare and data management, the Smart Watch System project stands as a noteworthy exemplar. This report undertakes an in-depth exploration of the development and implementation of the Smart Watch System—an undertaking with the potential to profoundly influence the healthcare industry and diverse other domains.

The Smart Watch System project signifies a substantial stride in leveraging advanced technology to harness data and connectivity effectively. Through the seamless integration of MSSQL database technology and Mod Sim technology, this system affords real-time monitoring capabilities for crucial data points, affording immediate access to mission-critical information. Additionally, the creation of a user-friendly Power BI dashboard enhances user interaction by presenting data in a lucid and comprehensible visual format.

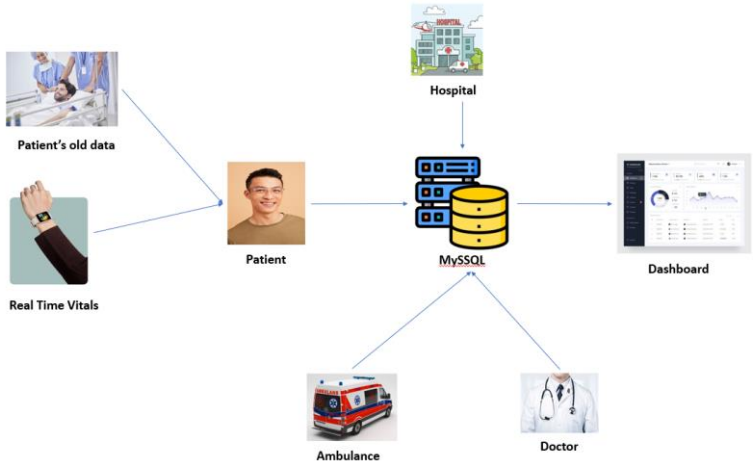
Problem Statement:

The traditional methods of patient monitoring in healthcare settings are often characterized by intermittent data collection, delayed response times, and a lack of real-time insights into patients' vital signs. This inadequacy poses significant challenges to healthcare professionals in making timely and informed decisions, particularly in critical situations. Furthermore, there is a growing need for more efficient data management systems across various industries, which can provide real-time access to critical information for improved decision-making.

To address these challenges and meet the evolving demands of healthcare and data management, our project aims to develop and implement a Smart Watch System. This system will leverage MSSQL database technology and Mod Sim technology to enable continuous, real-time monitoring of vital signs and other important metrics. The primary objective is to create a seamless and user-friendly platform that grants healthcare professionals and users immediate access to critical data, facilitating informed decision-making and enhancing patient care standards. Additionally, this system has the potential for broader applications in fields beyond healthcare, such as emergency response and data-driven decision-making across industries.

In summary, the problem statement revolves around the need for a technological solution that provides real-time monitoring, efficient data management, and immediate access to vital information. The Smart Watch System aims to bridge these gaps and revolutionize the way data is collected, analyzed, and utilized in various domains, ultimately improving the quality of care and decision-making processes.

Line of Action:



The line of action for the system depicted:

Patient Monitoring: It starts with the patient who is wearing a device that captures real-time vitals. This could be a smartwatch or any other wearable technology that monitors health metrics.

Data Aggregation: The real-time vitals are then sent to a central database system, which in this case is labeled as "MySQL." It's a popular open-source relational database management system.

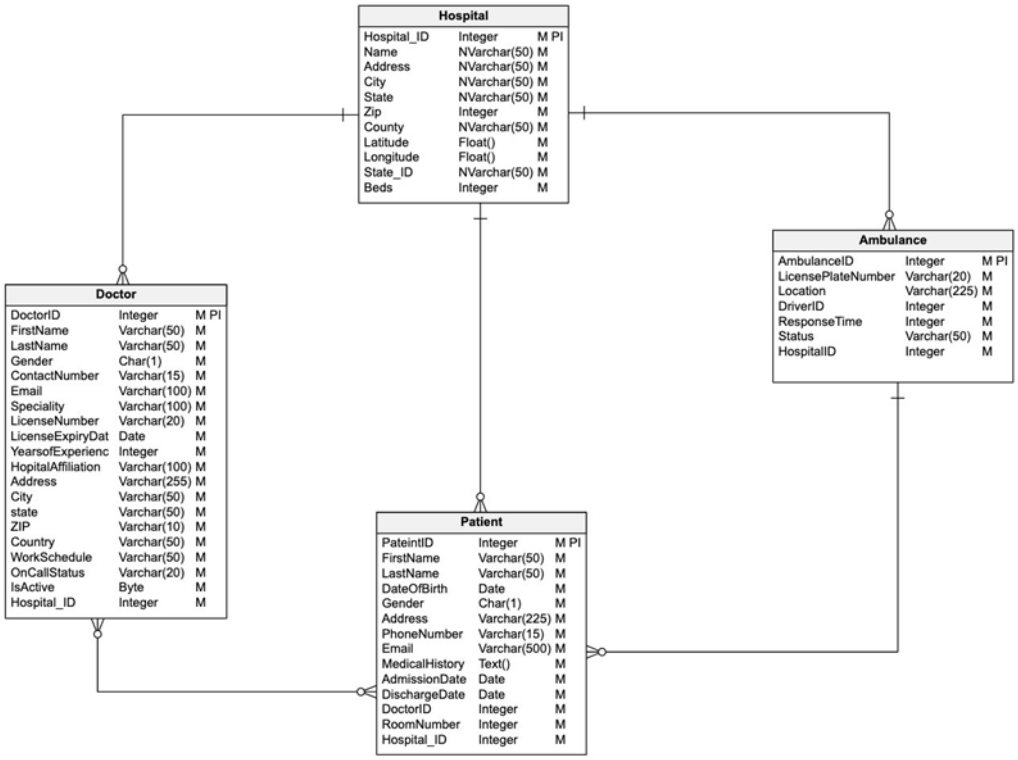
Historical Data Integration: Simultaneously, the patient's old data, which could be stored in hospital records or a previous database, is also sent to the MySQL database. This suggests that both current and historical data are being consolidated into a single system.

Data Access and Utilization:
Hospital: The consolidated data in the MySQL database is accessible by the hospital, which might use it for various purposes such as treatment planning, medical research, and administrative tasks.
Dashboard: A dashboard is shown as one of the end-points of the data flow, indicating that the data is used to create visual analytics, reports, or real-time monitoring screens for medical staff to review and make decisions.
Doctor: A doctor is also a direct recipient of the data, suggesting that the system is designed to keep healthcare providers informed about their patients' conditions.
Emergency Response: An ambulance is shown as part of the system, implying that in case of an emergency or a critical change in the patient's vitals, the system could trigger an alert to dispatch medical services.

In action, this system is designed to:

- Continuously monitor the patient's health.
- Aggregate real-time and historical health data for comprehensive analysis.
- Provide various stakeholders, such as medical staff and emergency services, with the information they need to make informed decisions.
- Enhance the overall efficiency and responsiveness of healthcare services.
- This system likely involves a range of technologies including IoT (Internet of Things) for real-time data capture, database management for storing and retrieving data, data visualization tools for the dashboard, and possibly machine learning algorithms for predictive analytics and alerts.

Conceptual Model:



1. Hospital
Attributes such as `Hospital_ID`, `Name`, `Address`, `City`, `State`, `Zip`, `County`, `Latitude`, `Longitude`, `State_ID`, and `Beds` indicate that this entity stores comprehensive information about each hospital, including its geographical location and capacity.

2. Doctor
Contains personal and professional details of doctors, including `DoctorID`, `FirstName`, `LastName`, `Gender`, `ContactNumber`, `Email`, `Specialty`, `LicenseNumber`, `LicenseExpiryDate`, `YearsOfExperience`, `HospitalAffiliation`, `Address`, `City`, `State`, `ZIP`, `Country`, `WorkSchedule`, `OnCallStatus`, and whether they are active (`IsActive`). The `Hospital_ID` serves as a foreign key linking to the `Hospital` entity, indicating which hospital the doctor is affiliated with.

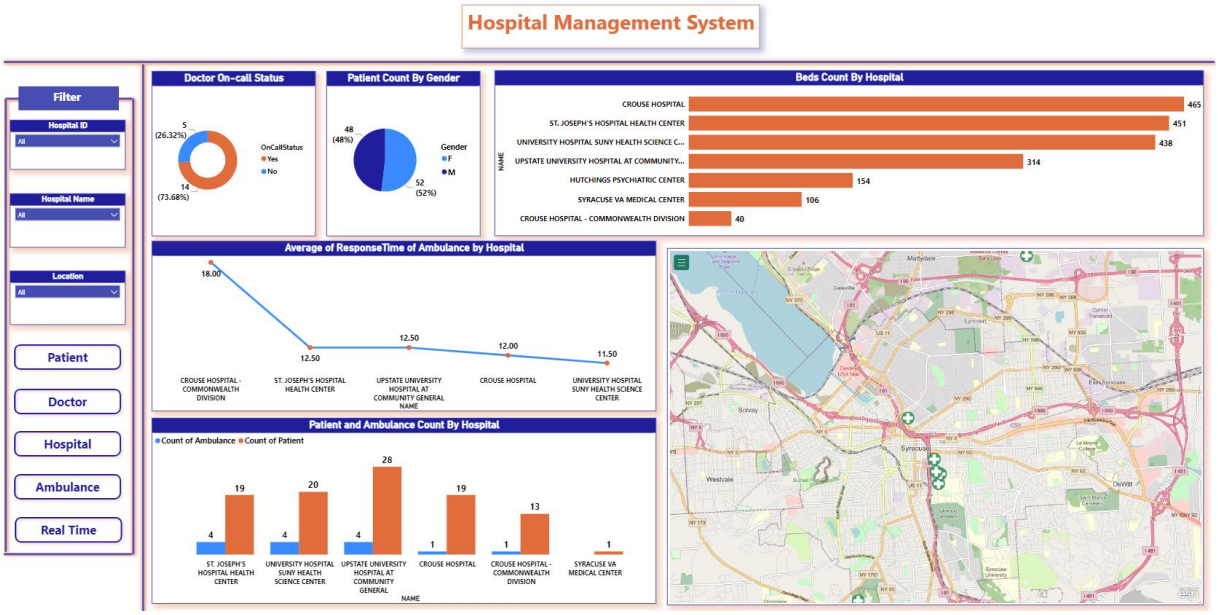
3. Patient
Holds patient-specific information like `PatientID`, `FirstName`, `LastName`, `DateOfBirth`, `Gender`, `Address`, `PhoneNumber`, `Email`, `MedicalHistory`, `AdmissionDate`, `DischargeDate`, `DoctorID`, `RoomNumber`, and `Hospital_ID`. The `DoctorID` and `Hospital_ID` are foreign keys that link to the `Doctor` and `Hospital` entities, respectively, showing the patient's assigned doctor and hospital location.

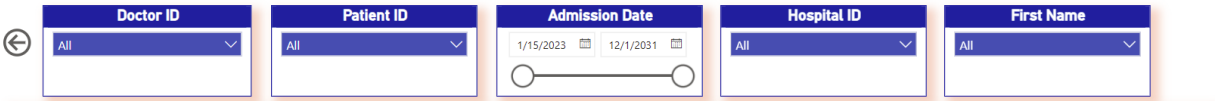
4. Ambulance
This entity captures details about ambulance services, including `AmbulanceID`, `LicensePlateNumber`, `Location`, `DriverID`, `ResponseTime`, `Status`, and `HospitalID`. The `HospitalID` is a foreign key that associates the ambulance with a specific hospital.

The relationships between these entities suggest that:
- A hospital can have multiple doctors and patients associated with it.
- A doctor can be affiliated with a hospital and can have multiple patients.
- Patients are linked to a doctor and a hospital, indicating who is responsible for their care and where they are being treated.
- Ambulances are linked to hospitals, possibly indicating which hospital they serve or to where they transport patients.

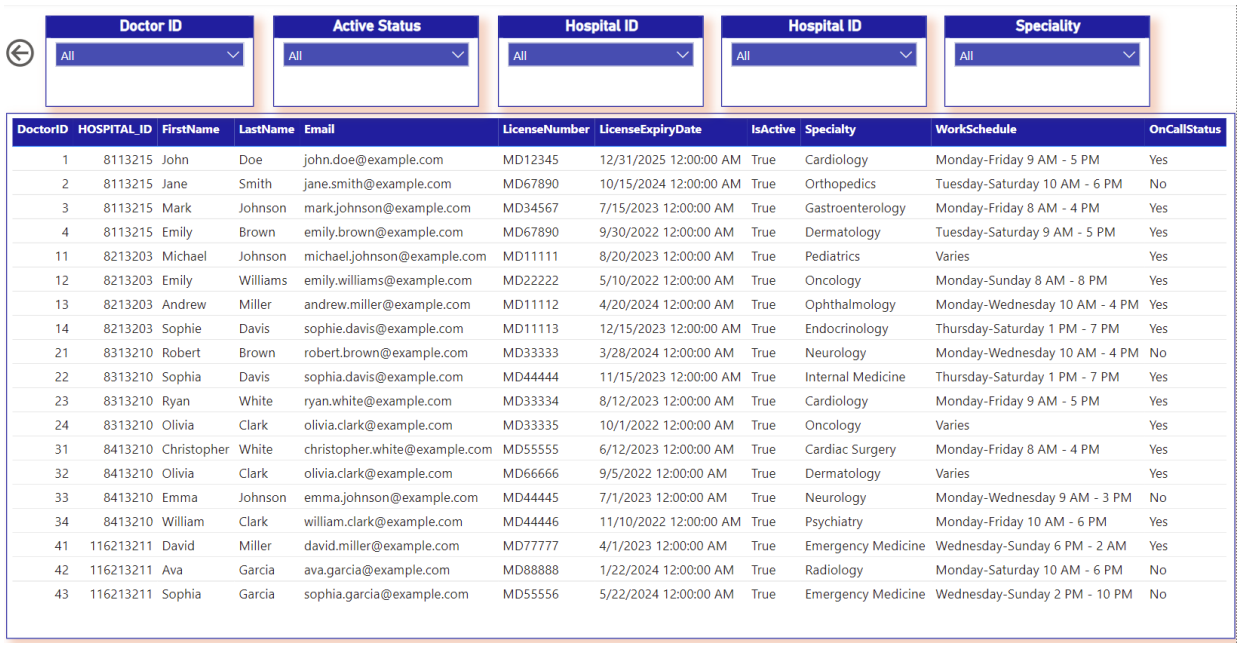
This ERD is used to design a relational database that facilitates the management of healthcare information, ensuring that all relevant data is interconnected and can be accessed efficiently by healthcare providers and administrative staff. The `M` and `PI` notations next to the attributes indicates whether the field is mandatory (`M`) and which fields are primary identifiers (`PI`) for the entity.

Power BI Report and Data Table:

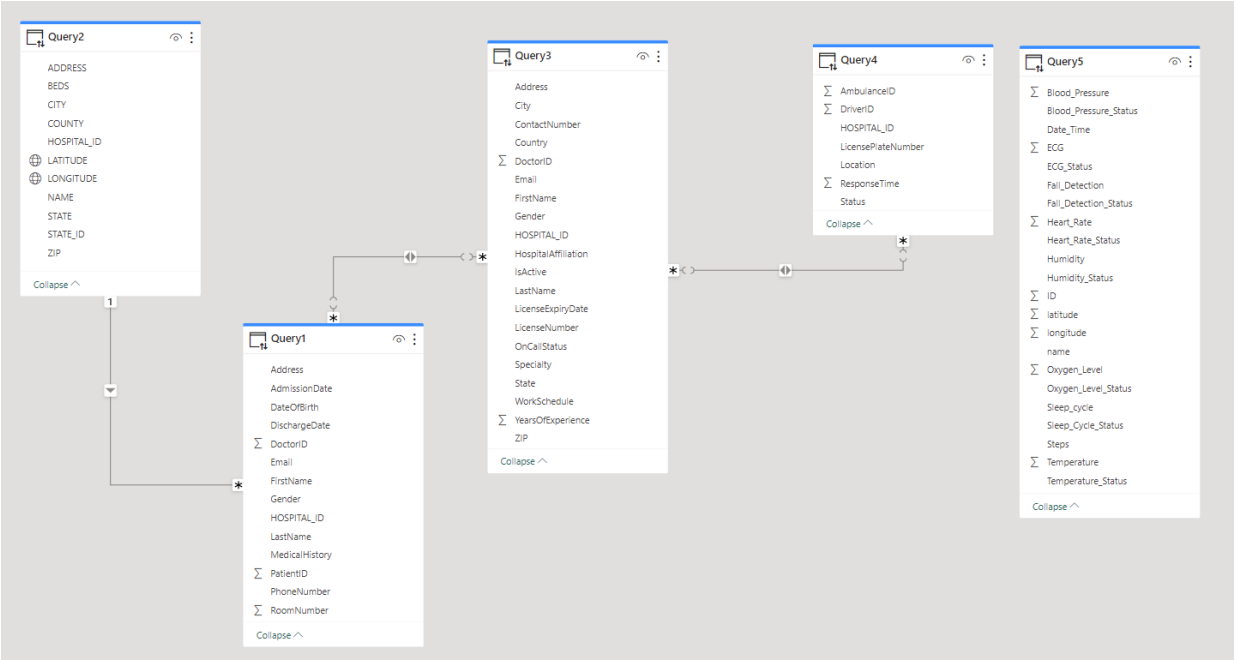




DoctorID	PatientID	HOSPITAL_ID	FirstName	LastName	Email	Gender	PhoneNumber	Sum of RoomNumber	MedicalHistory	AdmissionDate	Address
41	151	8413210	Zoe	Anderson	zoe.anderson@example.com	F	555-8888	141	Respiratory issues	1/15/2025 12:00:00 AM	123 Maple St
33	141	8313210	Sophie	Miller	sophie.miller@example.com	F	555-6666	133	High blood pressure	7/15/2024 12:00:00 AM	123 Oak St
12	120	8413210	Sophia	White	sophia.white@example.com	F	555-7777	112	Migraines	12/1/2023 12:00:00 AM	789 Elm St
104	214	8413210	Sophia	Taylor	sophia.taylor@example.com	M	555-1111	204	High blood pressure	9/15/2028 12:00:00 AM	789 Pine St
124	234	8413210	Sophia	Taylor	sophia.taylor@example.com	M	555-1111	224	High blood pressure	5/15/2030 12:00:00 AM	789 Pine St
89	199	8113215	Sophia	Miller	sophia.miller@example.com	F	555-2222	189	Asthma	6/30/2027 12:00:00 AM	789 Pine St
66	176	8213203	Sophia	Johnson	sophia.johnson@example.com	F	555-8888	166	Respiratory issues	4/1/2026 12:00:00 AM	123 Maple St
95	205	116213211	Sophia	Clark	sophia.clark@example.com	F	555-2222	195	Allergies	12/1/2027 12:00:00 AM	567 Oak St
115	225	116213211	Sophia	Clark	sophia.clark@example.com	F	555-2222	215	Allergies	8/1/2029 12:00:00 AM	567 Oak St
135	245	116213211	Sophia	Clark	sophia.clark@example.com	F	555-2222	245	Allergies	4/1/2031 12:00:00 AM	567 Oak St
7	71	8113215	Sarah	Anderson	sarah.anderson@example.com	F	555-4444	107	Respiratory issues	8/10/2023 12:00:00 AM	789 Oak St
99	209	8113215	Olivia	Taylor	olivia.taylor@example.com	F	555-2222	199	Asthma	4/1/2028 12:00:00 AM	789 Pine St
119	229	8113215	Olivia	Taylor	olivia.taylor@example.com	F	555-2222	219	Asthma	12/1/2029 12:00:00 AM	789 Pine St
139	249	8113215	Olivia	Taylor	olivia.taylor@example.com	F	555-2222	249	Asthma	8/1/2031 12:00:00 AM	789 Pine St
23	131	8213203	Olivia	Smith	olivia.smith@example.com	F	555-3333	123	Allergies	4/1/2024 12:00:00 AM	789 Pine St
81	191	8213203	Olivia	Johnson	olivia.johnson@example.com	F	555-8888	181	Respiratory issues	10/1/2026 12:00:00 AM	123 Maple St
106	216	8113215	Olivia	Clark	olivia.clark@example.com	M	555-3333	206	Back pain	11/15/2028 12:00:00 AM	789 Elm St
126	236	8113215	Olivia	Clark	olivia.clark@example.com	M	555-3333	226	Back pain	7/15/2030 12:00:00 AM	789 Elm St
90	200	8413210	Oliver	Taylor	oliver.taylor@example.com	M	555-1111	190	High blood pressure	7/15/2027 12:00:00 AM	789 Pine St
94	204	8413210	Oliver	Taylor	oliver.taylor@example.com	M	555-1111	194	High blood pressure	11/15/2027 12:00:00 AM	789 Pine St



DoctorID	HOSPITAL_ID	FirstName	LastName	Email	LicenseNumber	LicenseExpiryDate	IsActive	Specialty	WorkSchedule	OnCallStatus
1	8113215	John	Doe	john.doe@example.com	MD12345	12/31/2025 12:00:00 AM	True	Cardiology	Monday-Friday 9 AM - 5 PM	Yes
2	8113215	Jane	Smith	jane.smith@example.com	MD67890	10/15/2024 12:00:00 AM	True	Orthopedics	Tuesday-Saturday 10 AM - 6 PM	No
3	8113215	Mark	Johnson	mark.johnson@example.com	MD34567	7/15/2023 12:00:00 AM	True	Gastroenterology	Monday-Friday 8 AM - 4 PM	Yes
4	8113215	Emily	Brown	emily.brown@example.com	MD67890	9/30/2022 12:00:00 AM	True	Dermatology	Tuesday-Saturday 9 AM - 5 PM	Yes
11	8213203	Michael	Johnson	michael.johnson@example.com	MD11111	8/20/2023 12:00:00 AM	True	Pediatrics	Varies	Yes
12	8213203	Emily	Williams	emily.williams@example.com	MD22222	5/10/2022 12:00:00 AM	True	Oncology	Monday-Sunday 8 AM - 8 PM	Yes
13	8213203	Andrew	Miller	andrew.miller@example.com	MD11112	4/20/2024 12:00:00 AM	True	Ophthalmology	Monday-Wednesday 10 AM - 4 PM	Yes
14	8213203	Sophie	Davis	sophie.davis@example.com	MD11113	12/15/2023 12:00:00 AM	True	Endocrinology	Thursday-Saturday 1 PM - 7 PM	Yes
21	8313210	Robert	Brown	robert.brown@example.com	MD33333	3/28/2024 12:00:00 AM	True	Neurology	Monday-Wednesday 10 AM - 4 PM	No
22	8313210	Sophia	Davis	sophia.davis@example.com	MD44444	11/15/2023 12:00:00 AM	True	Internal Medicine	Thursday-Saturday 1 PM - 7 PM	Yes
23	8313210	Ryan	White	ryan.white@example.com	MD33334	8/12/2023 12:00:00 AM	True	Cardiology	Monday-Friday 9 AM - 5 PM	Yes
24	8313210	Olivia	Clark	olivia.clark@example.com	MD33335	10/1/2022 12:00:00 AM	True	Oncology	Varies	Yes
31	8413210	Christopher	White	christopher.white@example.com	MD55555	6/12/2023 12:00:00 AM	True	Cardiac Surgery	Monday-Friday 8 AM - 4 PM	Yes
32	8413210	Olivia	Clark	olivia.clark@example.com	MD66666	9/5/2022 12:00:00 AM	True	Dermatology	Varies	Yes
33	8413210	Emma	Johnson	emma.johnson@example.com	MD44445	7/1/2023 12:00:00 AM	True	Neurology	Monday-Wednesday 9 AM - 3 PM	No
34	8413210	William	Clark	william.clark@example.com	MD44446	11/10/2022 12:00:00 AM	True	Psychiatry	Monday-Friday 10 AM - 6 PM	Yes
41	116213211	David	Miller	david.miller@example.com	MD77777	4/1/2023 12:00:00 AM	True	Emergency Medicine	Wednesday-Sunday 6 PM - 2 AM	Yes
42	116213211	Ava	Garcia	ava.garcia@example.com	MD88888	1/22/2024 12:00:00 AM	True	Radiology	Monday-Saturday 10 AM - 6 PM	No
43	116213211	Sophia	Garcia	sophia.garcia@example.com	MD55556	5/22/2024 12:00:00 AM	True	Emergency Medicine	Wednesday-Sunday 2 PM - 10 PM	No



```sql
SELECT [HOSPITAL_ID]
      ,[NAME]
      ,[ADDRESS]
      ,[CITY]
      ,[STATE]
      ,[ZIP]
      ,[COUNTY]
      ,[LATITUDE]
      ,[LONGITUDE]
      ,[STATE_ID]
      ,[BEDS]
  FROM [Test].[dbo].[Hospitals_Syracuse]
```

100 %

Results Messages

	HOSPITAL_ID	NAME	ADDRESS	CITY	STATE	ZIP	COUNTY	LATITUDE	LONGITUDE	STATE_ID	BEDS
1	8113215	UPSTATE UNIVERSITY HOSPITAL AT COMMUNITY GENERAL	4900 BROAD ROAD	SYRACUSE	NY	13215	ONONDAGA	43.0080375671387	-76.1679000854492	3301007H	314
2	8213203	ST. JOSEPH'S HOSPITAL HEALTH CENTER	301 PROSPECT AVENUE	SYRACUSE	NY	13203	ONONDAGA	43.0559349060059	-76.1500625610352	3301003H	451
3	8313210	UNIVERSITY HOSPITAL SUNY HEALTH SCIENCE CENTER	750 EAST ADAMS STREET	SYRACUSE	NY	13210	ONONDAGA	43.0418968200684	-76.1398315429688	3301007H	438
4	8413210	CROUSE HOSPITAL	736 IRVING AVENUE	SYRACUSE	NY	13210	ONONDAGA	43.0412979125977	-76.1383972167969	3301008H	465
5	116213211	CROUSE HOSPITAL - COMMONWEALTH DIVISION	6010 EAST MALLOY ROAD	SYRACUSE	NY	13211	ONONDAGA	43.0984382629395	-76.1073913574219	3301008H	40
6	10913210	SYRACUSE VA MEDICAL CENTER	800 IRVING AVENUE	SYRACUSE	NY	13210	ONONDAGA	43.0388298034668	-76.1389541625977	VHA_528A7	106
7	171613210	HUTCHINGS PSYCHIATRIC CENTER	620 MADISON STREET	SYRACUSE	NY	13210	ONONDAGA	43.0451927185059	-76.1405410766602	NOT AVAILABLE	154

```sql
SELECT [PatientID]
      ,[FirstName]
      ,[LastName]
      ,[DateOfBirth]
      ,[Gender]
      ,[Address]
      ,[PhoneNumber]
      ,[Email]
      ,[MedicalHistory]
      ,[AdmissionDate]
      ,[DischargeDate]
      ,[DoctorID]
      ,[RoomNumber]
      ,[HOSPITAL_ID]
  FROM [Test].[dbo].[Patient_data]
```

100 %

Results Messages

	PatientID	FirstName	LastName	DateOfBirth	Gender	Address	PhoneNumber	Email	MedicalHistory	AdmissionDate	DischargeDate	DoctorID	RoomNumber	HOSPITAL_ID
1	1	John	Doe	1990-01-01	M	123 Main St	555-1234	john.doe@example.com	Heart condition	2023-01-15	NULL	1	101	8113215
2	2	Jane	Smith	1985-05-15	F	456 Oak St	555-5678	jane.smith@example.com	Fractured leg	2023-02-20	NULL	2	102	8213203
3	50	Alice	Johnson	1995-08-10	F	789 Pine St	555-9999	alice.johnson@example.com	Allergies	2023-03-10	NULL	3	103	8313210
4	51	Bob	Johnson	1982-03-25	M	456 Oak St	555-1111	bob.johnson@example.com	High blood pressure	2023-04-01	NULL	4	104	8413210
5	52	Emily	Smith	1998-09-12	F	789 Pine St	555-2222	emily.smith@example.com	Asthma	2023-05-15	NULL	5	105	116213211
6	53	David	Williams	1995-06-18	M	321 Maple St	555-3333	david.williams@example.com	Allergies	2023-07-20	NULL	6	106	8413210
7	70	Daniel	Miller	1975-12-08	M	111 Elm St	555-3333	daniel.miller@example.com	Diabetes	2023-06-30	NULL	6	106	10913210
8	71	Sarah	Anderson	1991-02-28	F	789 Oak St	555-4444	sarah.anderson@example.com	Respiratory issues	2023-08-10	NULL	7	107	8113215
9	72	Michael	Taylor	1987-07-15	M	567 Pine St	555-5555	michael.taylor@example.com	Back pain	2023-09-05	NULL	8	108	8213203
10	120	Sophia	White	1993-11-20	F	789 Elm St	555-7777	sophia.white@example.com	Migraines	2023-12-01	NULL	12	112	8413210
11	121	Daniel	Brown	1980-04-10	M	123 Maple St	555-8888	daniel.brown@example.com	High cholesterol	2024-01-15	NULL	13	113	8313210
12	122	Emma	Davis	1990-09-22	F	456 Elm St	555-9999	emma.davis@example.com	Arthritis	2024-02-20	NULL	14	114	116213211
13	130	Matthew	Johnson	1985-07-05	M	789 Oak St	555-2222	matthew.johnson@example.com	Sleep apnea	2024-03-10	NULL	22	122	8113215
14	131	Olivia	Smith	1994-05-18	F	789 Pine St	555-3333	olivia.smith@example.com	Allergies	2024-04-01	NULL	23	123	8213203
15	132	Henry	Taylor	1988-11-10	M	567 Elm St	555-4444	henry.taylor@example.com	Diabetes	2024-05-15	NULL	24	124	8413210
16	140	Ava	Johnson	1992-08-22	F	789 Oak St	555-5555	ava.johnson@example.com	Asthma	2024-06-30	NULL	32	132	116213211
17	141	Sophie	Miller	1990-03-15	F	123 Oak St	555-6666	sophie.miller@example.com	High blood pressure	2024-07-15	NULL	33	133	8313210
18	142	Jackson	Brown	1985-06-28	M	456 Maple St	555-7777	jackson.brown@example.com	Back pain	2024-08-10	NULL	34	134	8113215
19	145	Ella	Clark	1993-09-20	F	789 Elm St	555-9999	ella.clark@example.com	Migraines	2024-09-05	NULL	21	121	116213211
20	146	Lucas	Johnson	1989-12-10	M	789 Pine St	555-1111	lucas.johnson@example.com	Asthma	2024-10-01	NULL	35	135	8413210
21	147	Aria	Taylor	1998-02-25	F	567 Oak St	555-2222	aria.taylor@example.com	Allergies	2024-11-15	NULL	36	136	8313210
22	150	Liam	Miller	1995-04-05	M	789 Elm St	555-5555	liam.miller@example.com	High cholesterol	2024-12-01	NULL	40	140	8113215

```
SELECT [DoctorID]
      ,[FirstName]
      ,[LastName]
      ,[Gender]
      ,[ContactNumber]
      ,[Email]
      ,[Specialty]
      ,[LicenseNumber]
      ,[LicenseExpiryDate]
      ,[YearsOfExperience]
      ,[HospitalAffiliation]
      ,[Address]
      ,[City]
      ,[State]
      ,[ZIP]
      ,[Country]
      ,[WorkSchedule]
      ,[OnCallStatus]
      ,[IsActive]
      ,[HOSPITAL_ID]
  FROM [Test].[dbo].[DoctorData]
```

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Results Messages

	DoctorID	FirstName	LastName	Gender	ContactNumber	Email	Specialty	LicenseNumber	LicenseExpiryDate	YearsOfExperience	HospitalAffiliation	Address
1	1	John	Doe	M	123-456-7890	john.doe@example.com	Cardiology	MD12345	2025-12-31	10	Upstate University Hospital at Community General	4900 Broad Road
2	2	Jane	Smith	F	987-654-3210	jane.smith@example.com	Orthopedics	MD67890	2024-10-15	8	Upstate University Hospital at Community General	4900 Broad Road
3	3	Mark	Johnson	M	555-123-4567	mark.johnson@example.com	Gastroenterology	MD34567	2023-07-15	12	Upstate University Hospital at Community General	4900 Broad Road
4	4	Emily	Brown	F	555-987-6543	emily.brown@example.com	Dermatology	MD67890	2022-09-30	10	Upstate University Hospital at Community General	4900 Broad Road
5	11	Michael	Johnson	M	555-123-4567	michael.johnson@example.com	Pediatrics	MD11111	2023-08-20	15	St. Joseph's Hospital Health Center	301 Prospect Avenue
6	12	Emily	Williams	F	555-987-6543	emily.williams@example.com	Oncology	MD22222	2022-05-10	12	St. Joseph's Hospital Health Center	301 Prospect Avenue
7	13	Andrew	Miller	M	111-222-3333	andrew.miller@example.com	Ophthalmology	MD11112	2024-04-20	18	St. Joseph's Hospital Health Center	301 Prospect Avenue
8	14	Sophie	Davis	F	111-444-5555	sophie.davis@example.com	Endocrinology	MD11113	2023-12-15	15	St. Joseph's Hospital Health Center	301 Prospect Avenue
9	21	Robert	Brown	M	111-222-3333	robert.brown@example.com	Neurology	MD33333	2024-03-28	20	University Hospital SUNY Health Science Center	750 East Adams Street
10	22	Sophia	Davis	F	111-444-5555	sophia.davis@example.com	Internal Medicine	MD44444	2023-11-15	18	University Hospital SUNY Health Science Center	750 East Adams Street
11	23	Ryan	White	M	333-555-7777	ryan.white@example.com	Cardiology	MD33334	2023-08-12	22	University Hospital SUNY Health Science Center	750 East Adams Street
12	24	Olivia	Clark	F	333-777-9999	olivia.clark@example.com	Oncology	MD33335	2022-10-01	20	University Hospital SUNY Health Science Center	750 East Adams Street
13	31	Christopher	White	M	333-555-7777	christopher.white@example.com	Cardiac Surgery	MD55555	2023-06-12	25	Crouse Hospital	736 Irving Avenue
14	32	Olivia	Clark	F	333-777-9999	olivia.clark@example.com	Dermatology	MD66666	2022-09-05	10	Crouse Hospital	736 Irving Avenue
15	33	Emma	Johnson	F	444-666-8888	emma.johnson@example.com	Neurology	MD44445	2023-07-01	18	Crouse Hospital	736 Irving Avenue
16	34	William	Clark	M	444-888-0000	william.clark@example.com	Psychiatry	MD44446	2022-11-10	15	Crouse Hospital	736 Irving Avenue
17	41	David	Miller	M	444-666-8888	david.miller@example.com	Emergency Medicine	MD77777	2023-04-01	15	Crouse Hospital - Commonwealth Division	6010 East Malloy Road
18	42	Ava	Garcia	F	444-888-0000	ava.garcia@example.com	Radiology	MD88888	2024-01-22	12	Crouse Hospital - Commonwealth Division	6010 East Malloy Road
19	43	Sophia	Garcia	F	555-999-1111	sophia.garcia@example.com	Emergency Medicine	MD55556	2024-05-22	12	Crouse Hospital - Commonwealth Division	6010 East Malloy Road

```
SELECT [AmbulanceID]
      ,[LicensePlateNumber]
      ,[Location]
      ,[DriverID]
      ,[ResponseTime]
      ,[Status]
      ,[HOSPITAL_ID]
  FROM [Test].[dbo].[AmbulanceData]
```

100 %

Results | Messages

	AmbulanceID	LicensePlateNumber	Location	DriverID	ResponseTime	Status	HOSPITAL_ID
1	1	ABC123	City Center	101	10	Available	8113215
2	2	XYZ789	Suburb Area	102	15	Busy	8213203
3	3	MNO456	Hospital A	103	8	Available	8313210
4	4	PQR789	Residential Area	104	12	Out of Service	8413210
5	5	JKL321	Industrial Zone	105	18	Available	116213211
6	6	DEF456	Shopping Mall	106	14	Busy	10913210
7	7	GHI789	School Area	107	9	Available	171613210
8	8	ABC456	Downtown Area	108	11	Available	8113215
9	9	XYZ789	Suburb Area	109	13	Busy	8113215
10	10	MNO123	City Center	110	16	Available	8113215
11	11	PQR456	Residential Area	111	9	Busy	8213203
12	12	JKL789	Industrial Zone	112	14	Available	8213203
13	13	DEF123	Shopping Mall	113	12	Available	8213203
14	14	GHI456	School Area	114	10	Busy	8313210
15	15	UVW789	Park District	115	17	Available	8313210
16	16	LMN123	Hospital B	116	11	Available	8313210

Contributions:

Abhishek: Frontend Code, Power BI Analytics Dashboard

Austin: Database Creation, Presentations, Report

Neha: Frontend Code

Prakruti: Database Modelling

Conclusion:

We express our sincere appreciation to Professor Aaron Miller, whose mentorship throughout this course was invaluable. The project we undertook presented an intricate tapestry of challenges and triumphs that deepened our understanding of web development intricacies. It was an enlightening journey, from conceptualizing the framework to executing a fully-fledged web application, which not only honed our technical skills but also broadened our perspective on the multifaceted role of a software developer. The project's varied demands fostered a culture of perpetual learning and intellectual curiosity, with each phase presenting unique problems that required innovative solutions. In essence, this venture was a harmonious fusion of persistent education, problem-solving, and professional growth.