



Sillah Phase 4

CS340: Introduction to Databases Systems

Section: 1629

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1. Database Implementation

1.1 Database Creation and Tables

The database cs340_project was successfully created and initialized.

To verify the schema structure, the SHOW TABLES; command was executed.

Presenting All Tables

The screenshot shows a MySQL Workbench interface with a dark theme. At the top, there is a code editor window containing the SQL command 'SHOW TABLES;'. Below the code editor is a result grid titled 'Result Grid' with a search bar labeled 'Filter Rows:'. The results show a table named 'Tables_in_cs340_project' containing a list of nine tables: Appointment, AwarenessContent, Clinic, FamilyMember, HealthCondition, HealthEvent, MedicalHistory, RiskAlert, and User. The 'Result Grid' has a header row with columns for table names and other metadata.

Tables_in_cs340_project
Appointment
AwarenessContent
Clinic
FamilyMember
HealthCondition
HealthEvent
MedicalHistory
RiskAlert
User

The following tables were created:

- Appointment
- AwarenessContent
- Clinic

- FamilyMember
- HealthEvent
- RiskAlert
- HealthCondition
- MedicalHistory
- User

This confirms that all required entities were implemented in the relational schema.

1.2 Table Structure Verification

The structure of core tables was verified using the DESCRIBE command to confirm:

- Primary keys
- Null constraints
- Auto-increment
- Data types
- Default values
- properties

User Table						
1 * DESCRIBE User;						
Result Grid Filter Rows: Search Export:						
Field	Type	Null	Key	Default	Extra	
user_id	int	NO	PRI	NULL		auto_increment
first_name	varchar(50)	YES		NULL		
last_name	varchar(50)	YES		NULL		
email	varchar(100)	YES	UNI	NULL		
password_hash	varchar(255)	YES		NULL		
phone_number	varchar(20)	YES		NULL		
created_at	datetime	YES		CURRENT_TIMESTAMP	DEFAULT_GENERATED	

The User table includes:

- Primary Key: user_id

- Unique constraint on email
- Automatic timestamp generation for created_at

FamilyMember Table						
	DESCRIBE FamilyMember;					
	Field	Type	Null	Key	Default	Extra
	member_id	int	NO	PRI	NULL	auto_increment
	user_id	int	NO	MUL	NULL	
	first_name	varchar(50)	NO		NULL	
	last_name	varchar(50)	NO		NULL	
	date_of_birth	date	NO		NULL	
	relationship	varchar(50)	YES		NULL	
	contact_phone	varchar(20)	YES		NULL	
	medical_history	text	YES		NULL	
	blood_type	enum('A+','A-','B+','B-','AB+','AB-','O+','O-')	YES		NULL	
	gender	enum('Male','Female')	YES		NULL	
	status	varchar(30)	YES		NULL	

The FamilyMember table includes:

- Primary Key: member_id
- Foreign key reference to User
- Enum constraints for blood_type and gender
- Proper nullability rules for optional attributes

MedicalHistory Table

```
1 • DESCRIBE MedicalHistory;
```

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Result Grid Filter Rows: Search Export:

Field	Type	Null	Key	Default	Extra
event_id	int	NO	PRI	NULL	auto_increment
member_id	int	NO	MUL	NULL	
condition_id	int	NO	MUL	NULL	
event_date	date	NO		NULL	
event_type	varchar(50)	YES		NULL	
diagnosis	text	YES		NULL	
severity	enum('Low','Medium','High')	YES		NULL	
symptoms	text	YES		NULL	
treatment	text	YES		NULL	
outcome	text	YES		NULL	

The MedicalHistory table includes:

- Primary Key: event_id
- Foreign key references to:
 - FamilyMember
 - HealthCondition
- Enum constraint for severity
- Proper indexing on foreign keys

1.3 Foreign Key Constraints and Referential Integrity

Foreign key relationships were verified using the SHOW CREATE TABLE command.

This ensures referential integrity is enforced at the database level.

The screenshot shows two panes from MySQL Workbench. The left pane is titled 'FamilyMember Foreign Key' and contains the results of the command:

```
1 SHOW CREATE TABLE FamilyMember;
2
```

The right pane is also titled 'FamilyMember Foreign Key' and shows the full CREATE TABLE statement for 'FamilyMember':

```
1 • SHOW CREATE TABLE FamilyMember;
```

```
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Form Editor Navigate: |<< < 1/1 > >>|
```

Table:	FamilyMember
Create Table:	CREATE TABLE `FamilyMember` (`member_id` int NOT NULL AUTO_INCREMENT, `user_id` int NOT NULL, `first_name` varchar(50) NOT NULL, `last_name` varchar(50) NOT NULL, `date_of_birth` date NOT NULL, `relationship` varchar(50) DEFAULT NULL, `contact_phone` varchar(20) DEFAULT NULL, `medical_history` text, `blood_type` enum('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-') DEFAULT NULL, `gender` enum('Male', 'Female') DEFAULT NULL, `status` varchar(30) DEFAULT NULL, PRIMARY KEY (`member_id`), KEY `fk_family_user` (`user_id`),)

This confirms:

- FamilyMember.user_id references User.user_id
- Cascade rules are correctly applied

MedicalHistory Foreign Keys

```

1 • SHOW CREATE TABLE MedicalHistory;

```

Result Grid Filter Rows: Search Export:

Table	Create Table
MedicalHistory	CREATE TABLE `MedicalHistory` (`event_id` i...


```

1 • SHOW CREATE TABLE MedicalHistory;

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Table: MedicalHistory

```

Create Table:

```

CREATE TABLE `MedicalHistory` (
  `event_id` int NOT NULL AUTO_INCREMENT,
  `member_id` int NOT NULL,
  `condition_id` int NOT NULL,
  `event_date` date NOT NULL,
  `event_type` varchar(50) DEFAULT NULL,
  `diagnosis` text,
  `severity` enum('Low','Medium','High') DEFAULT NULL,
  `symptoms` text,
  `treatment` text,
  `outcome` text,
  PRIMARY KEY (`event_id`),
  KEY `fk_history_member` (`member_id`),
  KEY `fk_history_condition` (`condition_id`)
)

```

This confirms:

- MedicalHistory.member_id references FamilyMember.member_id
- MedicalHistory.condition_id references HealthCondition.condition_id
- Referential integrity is enforced through foreign key constraints

1.4 Data Population Verification

After table creation, sample data was inserted into all tables.

To verify successful data insertion, row counts were retrieved using aggregate queries.

Row Count

```

1 •   SELECT
2      (SELECT COUNT(*) FROM User) AS Users,
3      (SELECT COUNT(*) FROM FamilyMember) AS FamilyMembers,
4      (SELECT COUNT(*) FROM HealthCondition) AS HealthConditions,
5      (SELECT COUNT(*) FROM MedicalHistory) AS MedicalHistory,
6      (SELECT COUNT(*) FROM RiskAlert) AS RiskAlerts,
7      (SELECT COUNT(*) FROM Clinic) AS Clinics,
8      (SELECT COUNT(*) FROM Appointment) AS Appointments,
9      (SELECT COUNT(*) FROM AwarenessContent) AS AwarenessContent,
10     (SELECT COUNT(*) FROM HealthEvent) AS HealthEvents;
11

```

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Result Grid Filter Rows: Search Export:

Users	FamilyMembers	HealthConditi...	MedicalHisto...	RiskAlerts	Clinics	Appointmen...	AwarenessContent	HealthEvents
10	20	10	10	10	20	10	10	10

Row count summary:

- Users: 10
- FamilyMembers: 20
- HealthConditions: 10
- MedicalHistory: 10
- RiskAlerts: 10
- Clinics: 20
- Appointments: 10
- AwarenessContent: 10
- HealthEvents: 10

This confirms that all tables are populated and operational.

Conclusion

The database implementation satisfies the project requirements:

- All required entities were created.

- Primary and foreign key constraints were correctly implemented.
- Referential integrity is enforced.
- Appropriate data types and constraints are applied.
- The database is populated with consistent sample data.

The system is fully functional at the relational database level.