

Database Design Assignment

```
CREATE DATABASE IF NOT EXISTS BikeRental;
USE BikeRental;
```

```
CREATE TABLE Users (
  UserID INT AUTO_INCREMENT PRIMARY KEY,
  Name VARCHAR(100) NOT NULL,
  Email VARCHAR(100) NOT NULL UNIQUE,
  Phone VARCHAR(20) NOT NULL,
  Address VARCHAR(255),
  RegistrationDate DATE,
  Password VARCHAR(255) NOT NULL,
  CONSTRAINT chk_email CHECK (Email LIKE '%@%.%')
);
```

```
SELECT * FROM Users;
```

Result Grid		Filter Rows	Edit	Export/Import	Wrap Cell Content	
UserID	Name	Email	Phone	Address	RegistrationDate	Password
1	John Smith	john.smith@email.com	123-456-7890	123 Main St, City, Country	2025-03-14	password123
2	Emma Johnson	emma.johnson@email.com	234-567-8901	456 Elm St, City, Country	2025-03-14	securepass456
3	Michael Brown	michael.brown@email.com	345-678-9012	789 Oak St, City, Country	2025-03-14	brownie789
4	Sophia Davis	sophia.davis@email.com	456-789-0123	101 Pine St, City, Country	2025-03-14	sophia2023
5	William Wilson	william.wilson@email.com	567-890-1234	202 Maple St, City, Country	2025-03-14	willpower555
6	Olivia Taylor	olivia.taylor@email.com	678-901-2345	303 Cedar St, City, Country	2025-03-14	oliveoil777
7	James Anderson	james.anderson@email.com	789-012-3456	404 Birch St, City, Country	2025-03-14	jamesrules888
8	Ava Martinez	ava.martinez@email.com	890-123-4567	505 Walnut St, City, Country	2025-03-14	avamartinez999
9	Benjamin Lee	benjamin.lee@email.com	901-234-5678	606 Spruce St, City, Country	2025-03-14	benjilee101
10	Mia Rodriguez	mia.rodriguez@email.com	012-345-6789	707 Fir St, City, Country	2025-03-14	miaRodriguez202

```
DELIMITER //
CREATE TRIGGER before_insert_users
BEFORE INSERT ON Users
FOR EACH ROW
BEGIN
  IF NEW.RegistrationDate IS NULL THEN
    SET NEW.RegistrationDate = CURDATE();
  END IF;
END//
DELIMITER ;
```

```
-- Create Bikes Table
CREATE TABLE Bikes (
  BikeID INT AUTO_INCREMENT PRIMARY KEY,
  Model VARCHAR(100) NOT NULL,
  Type VARCHAR(50) NOT NULL,
  HourlyRate DECIMAL(10, 2) NOT NULL,
  Status ENUM('Available', 'Rented', 'Maintenance') DEFAULT 'Available',
  Location VARCHAR(100) NOT NULL,
  YearManufactured INT NOT NULL,
  CONSTRAINT chk_year CHECK (YearManufactured >= 2000)
);
```

```
select * from Bikes;
```

```
-- Create Bookings Table
CREATE TABLE Bookings (
  BookingID INT AUTO_INCREMENT PRIMARY KEY,
  UserID INT NOT NULL,
  BikeID INT NOT NULL,
  StartTime DATETIME NOT NULL,
  EndTime DATETIME NOT NULL,
  Status ENUM('Pending', 'Active', 'Completed', 'Cancelled') DEFAULT 'Pending',
  TotalAmount DECIMAL(10, 2) NOT NULL,
  Notes TEXT,
  FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE,
  FOREIGN KEY (BikeID) REFERENCES Bikes(BikeID) ON DELETE CASCADE,
  CONSTRAINT chk_time CHECK (EndTime > StartTime)
);
```

```
-- Create Payments Table
CREATE TABLE Payments (
  PaymentID INT AUTO_INCREMENT PRIMARY KEY,
  BookingID INT NOT NULL,
  PaymentDate DATETIME DEFAULT CURRENT_TIMESTAMP,
  Amount DECIMAL(10, 2) NOT NULL,
  PaymentMethod ENUM('Credit Card', 'Debit Card', 'PayPal', 'Cash') NOT NULL,
  TransactionID VARCHAR(100) UNIQUE,
  Status ENUM('Pending', 'Completed', 'Failed', 'Refunded') DEFAULT 'Pending',
  FOREIGN KEY (BookingID) REFERENCES Bookings(BookingID) ON DELETE CASCADE
);
```

```
-- Insert Data into Users Table
```

```

INSERT INTO Users (Name, Email, Phone, Address, RegistrationDate, Password) VALUES
('John Smith', 'john.smith@email.com', '123-456-7890', '123 Main St, City, Country', CURDATE(),
'password123'),
('Emma Johnson', 'emma.johnson@email.com', '234-567-8901', '456 Elm St, City, Country',
CURDATE(), 'securepass456'),
('Michael Brown', 'michael.brown@email.com', '345-678-9012', '789 Oak St, City, Country',
CURDATE(), 'brownie789'),
('Sophia Davis', 'sophia.davis@email.com', '456-789-0123', '101 Pine St, City, Country', CURDATE(),
'sophia2023'),
('William Wilson', 'william.wilson@email.com', '567-890-1234', '202 Maple St, City, Country',
CURDATE(), 'willpower555'),
('Olivia Taylor', 'olivia.taylor@email.com', '678-901-2345', '303 Cedar St, City, Country', CURDATE(),
'oliveoil777'),
('James Anderson', 'james.anderson@email.com', '789-012-3456', '404 Birch St, City, Country',
CURDATE(), 'jamesrules888'),
('Ava Martinez', 'ava.martinez@email.com', '890-123-4567', '505 Walnut St, City, Country',
CURDATE(), 'avamartinez999'),
('Benjamin Lee', 'benjamin.lee@email.com', '901-234-5678', '606 Spruce St, City, Country',
CURDATE(), 'benjilee101'),
('Mia Rodriguez', 'mia.rodriguez@email.com', '012-345-6789', '707 Fir St, City, Country', CURDATE(),
'miarodriguez202');

```

-- Insert Data into Bikes Table

```

INSERT INTO Bikes (Model, Type, HourlyRate, Status, Location, YearManufactured) VALUES
('Trek FX 2', 'City Bike', 12.50, 'Available', 'North Station', 2021),
('Specialized Rockhopper', 'Mountain Bike', 15.00, 'Available', 'East Station', 2020),
('Cannondale Synapse', 'Road Bike', 18.00, 'Available', 'South Station', 2022),
('Giant Talon', 'Mountain Bike', 14.50, 'Available', 'West Station', 2021),
('Schwinn Cruiser', 'Cruiser Bike', 10.00, 'Available', 'Central Park', 2019),
('Rad Power RadRunner', 'Electric Bike', 25.00, 'Available', 'Downtown Hub', 2023),
('Brompton M6L', 'Folding Bike', 20.00, 'Available', 'Train Station', 2022),
('Surly Long Haul Trucker', 'Touring Bike', 16.00, 'Available', 'Bike Shop', 2020),
('Kona Dew', 'Hybrid Bike', 13.00, 'Available', 'University', 2021),
('Norco Bigfoot', 'Fat Bike', 22.00, 'Maintenance', 'Mountain Resort', 2022);

```

-- Insert Data into Bookings Table

```

INSERT INTO Bookings (UserID, BikeID, StartTime, EndTime, Status, TotalAmount, Notes) VALUES
(1, 3, '2025-03-10 10:00:00', '2025-03-10 14:00:00', 'Completed', 72.00, 'Weekend ride'),
(2, 1, '2025-03-11 09:00:00', '2025-03-11 12:00:00', 'Completed', 37.50, 'City tour'),
(3, 6, '2025-03-12 14:00:00', '2025-03-12 17:00:00', 'Completed', 75.00, 'Electric bike trial'),
(4, 2, '2025-03-13 08:00:00', '2025-03-13 12:00:00', 'Completed', 60.00, 'Mountain trail ride'),
(5, 4, '2025-03-14 11:00:00', '2025-03-14 15:00:00', 'Active', 58.00, 'Group ride'),
(6, 7, '2025-03-15 13:00:00', '2025-03-15 16:00:00', 'Pending', 60.00, 'Try folding bike'),
(7, 8, '2025-03-16 07:00:00', '2025-03-16 19:00:00', 'Pending', 192.00, 'Full day tour'),
(8, 5, '2025-03-17 10:00:00', '2025-03-17 12:00:00', 'Pending', 20.00, 'Short ride'),
(9, 9, '2025-03-18 15:00:00', '2025-03-18 18:00:00', 'Cancelled', 39.00, 'Changed plans'),
(10, 1, '2025-03-19 09:00:00', '2025-03-19 13:00:00', 'Pending', 50.00, 'Business commute');

```

-- Insert Data into Payments Table

```

INSERT INTO Payments (BookingID, PaymentDate, Amount, PaymentMethod, TransactionID, Status)
VALUES
(1, '2025-03-10 09:30:00', 72.00, 'Credit Card', 'TXN123456789', 'Completed'),
(2, '2025-03-11 08:45:00', 37.50, 'PayPal', 'PP987654321', 'Completed'),
(3, '2025-03-12 13:50:00', 75.00, 'Debit Card', 'DC456789123', 'Completed'),
(4, '2025-03-13 07:55:00', 60.00, 'Credit Card', 'TXN789123456', 'Completed'),
(5, '2025-03-14 10:45:00', 58.00, 'PayPal', 'PP456123789', 'Completed'),
(6, '2025-03-15 12:30:00', 60.00, 'Credit Card', 'TXN321654987', 'Pending'),
(7, '2025-03-16 06:45:00', 192.00, 'Debit Card', 'DC159753468', 'Pending'),
(8, '2025-03-17 09:50:00', 20.00, 'Cash', 'CASH001002', 'Pending'),
(9, '2025-03-18 14:55:00', 39.00, 'Credit Card', 'TXN753159852', 'Refunded'),
(10, '2025-03-19 08:40:00', 50.00, 'PayPal', 'PP258369147', 'Pending');

```

-- 1. Select all available bikes

```
SELECT * FROM Bikes WHERE Status = 'Available';
```

Result Grid		Filter Rows:		Edit:		Export/Import:		Wrap Cell Content:	
	BikeID	Model	Type	HourlyRate	Status	Location	YearManufactured		
1		Trek FX 2	City Bike	12.50	Available	North Station	2021		
2		Specialized Rockhopper	Mountain Bike	15.00	Available	East Station	2020		
3		Cannondale Synapse	Road Bike	18.00	Available	South Station	2022		
4		Giant Talon	Mountain Bike	14.50	Available	West Station	2021		
5		Schwinn Cruiser	Cruiser Bike	10.00	Available	Central Park	2019		
6		Rad Power RadRunner	Electric Bike	25.00	Available	Downtown Hub	2023		
7		Brompton M6L	Folding Bike	20.00	Available	Train Station	2022		
8		Surly Long Haul Trucker	Touring Bike	16.00	Available	Bike Shop	2020		
9		Kona Dew	Hybrid Bike	13.00	Available	University	2021		
*	ROLL	ROLL	ROLL	ROLL	ROLL	ROLL	ROLL		

-- 2. Select all active bookings

```
SELECT * FROM Bookings WHERE Status = 'Active';
```

Result Grid								
Filter Rows:								
	BookingID	UserID	BikeID	StartTime	EndTime	Status	TotalAmount	Notes
▶	5	5	4	2025-03-14 11:00:00	2025-03-14 15:00:00	Active	58.00	Group ride
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

-- 3. Select all users who registered in 2025
SELECT * FROM Users WHERE YEAR(RegistrationDate) = 2025;

Result Grid								
Filter Rows:								
	UserID	Name	Email	Phone	Address	RegistrationDate	Password	
▶	1	John Smith	john.smith@email.com	123-456-7890	123 Main St, City, Country	2025-03-14	password123	
	2	Emma Johnson	emma.johnson@email.com	234-567-8901	456 Elm St, City, Country	2025-03-14	securepass456	
	3	Michael Brown	michael.brown@email.com	345-678-9012	789 Oak St, City, Country	2025-03-14	brownie789	
	4	Sophia Davis	sophia.davis@email.com	456-789-0123	101 Pine St, City, Country	2025-03-14	sophia2023	
	5	William Wilson	william.wilson@email.com	567-890-1234	202 Maple St, City, Country	2025-03-14	willpower555	
	6	Olivia Taylor	olivia.taylor@email.com	678-901-2345	303 Cedar St, City, Country	2025-03-14	oliveoil777	
	7	James Anderson	james.anderson@email.com	789-012-3456	404 Birch St, City, Country	2025-03-14	jamesrules888	
	8	Ava Martinez	ava.martinez@email.com	890-123-4567	505 Walnut St, City, Country	2025-03-14	avamartinez999	
	9	Benjamin Lee	benjamin.lee@email.com	901-234-5678	606 Spruce St, City, Country	2025-03-14	benjilee101	
	10	Mia Rodriguez	mia.rodriguez@email.com	012-345-6789	707 Fir St, City, Country	2025-03-14	miarodriguez202	
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

-- 4. Select all payments made via Credit Card
SELECT * FROM Payments WHERE PaymentMethod = 'Credit Card';

Result Grid								
Filter Rows:								
	PaymentID	BookingID	PaymentDate	Amount	PaymentMethod	TransactionID	Status	
▶	1	1	2025-03-10 09:30:00	72.00	Credit Card	TXN123456789	Completed	
	4	4	2025-03-13 07:55:00	60.00	Credit Card	TXN789123456	Completed	
	6	6	2025-03-15 12:30:00	60.00	Credit Card	TXN321654987	Pending	
	9	9	2025-03-18 14:55:00	39.00	Credit Card	TXN753159852	Refunded	
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

-- 1. Update bike status when rented
UPDATE Bikes SET Status = 'Rented' WHERE BikeID = 3;

-- DELETE Operations
-- 1. Delete a cancelled booking
DELETE FROM Bookings WHERE Status = 'Cancelled' AND BookingID = 9;

-- 2. Delete a user account
DELETE FROM Users WHERE UserID = 10;

-- 1. INNER JOIN: Get all bookings with user details
SELECT b.BookingID, u.Name, u.Email, b.StartTime, b.EndTime, b.TotalAmount
FROM Bookings b
INNER JOIN Users u ON b.UserID = u.UserID;

Result Grid						
Filter Rows:						
	BookingID	Name	Email	StartTime	EndTime	TotalAmount
▶	1	John Smith	john.smith@email.com	2025-03-10 10:00:00	2025-03-10 14:00:00	72.00
	2	Emma Johnson	emma.johnson@email.com	2025-03-11 09:00:00	2025-03-11 12:00:00	37.50
	3	Michael Brown	michael.brown@email.com	2025-03-12 14:00:00	2025-03-12 17:00:00	75.00
	4	Sophia Davis	sophia.davis@email.com	2025-03-13 08:00:00	2025-03-13 12:00:00	60.00
	5	William Wilson	william.wilson@email.com	2025-03-14 11:00:00	2025-03-14 15:00:00	58.00
	6	Olivia Taylor	olivia.taylor@email.com	2025-03-15 13:00:00	2025-03-15 16:00:00	60.00
	7	James Anderson	james.anderson@email.com	2025-03-16 07:00:00	2025-03-16 19:00:00	192.00
	8	Ava Martinez	ava.martinez@email.com	2025-03-17 10:00:00	2025-03-17 12:00:00	20.00
	10	Mia Rodriguez	mia.rodriguez@email.com	2025-03-19 09:00:00	2025-03-19 13:00:00	50.00

-- 2. LEFT JOIN: Get all bikes and their booking details (including bikes with no bookings)
SELECT bk.BikeID, bk.Model, bk.Type, b.BookingID, b.StartTime, b.EndTime
FROM Bikes bk
LEFT JOIN Bookings b ON bk.BikeID = b.BikeID;

Result Grid					
Filter Rows:					
	BikeID	Model	Type	BookingID	StartTime
▶	1	Trek FX 2	City Bike	2	2025-03-11 09:00:00
	1	Trek FX 2	City Bike	10	2025-03-19 09:00:00
	2	Specialized Rockhopper	Mountain Bike	4	2025-03-13 08:00:00
	3	Cannondale Synapse	Road Bike	1	2025-03-10 10:00:00
	4	Giant Talon	Mountain Bike	5	2025-03-14 11:00:00
	5	Schwinn Cruiser	Cruiser Bike	8	2025-03-17 10:00:00
	6	Rad Power RadRunner	Electric Bike	3	2025-03-12 14:00:00
	7	Brompton M6L	Folding Bike	6	2025-03-15 13:00:00
	8	Surly Long Haul Truckster	Touring Bike	7	2025-03-16 07:00:00
	9	Kona Dew	Hybrid Bike	NULL	NULL
	10	Norco Bigfoot	Fat Bike	NULL	NULL


```
-- 3. RIGHT JOIN: Get all payments and their corresponding bookings
SELECT p.PaymentID, p.Amount, p.PaymentMethod, p.Status, b.BookingID, b.StartTime, b.EndTime
FROM Bookings b
RIGHT JOIN Payments p ON b.BookingID = p.BookingID;
```

Result Grid						
Filter Rows:		Export:		Wrap Cell Contents:		
	BikeID	Model	Type	BookingID	StartTime	EndTime
▶	1	Trek FX 2	City Bike	2	2025-03-11 09:00:00	2025-03-11 12:00:00
	1	Trek FX 2	City Bike	10	2025-03-19 09:00:00	2025-03-19 13:00:00
	2	Specialized Rockhopper	Mountain Bike	4	2025-03-13 08:00:00	2025-03-13 12:00:00
	3	Cannondale Synapse	Road Bike	1	2025-03-10 10:00:00	2025-03-10 14:00:00
	4	Giant Talon	Mountain Bike	5	2025-03-14 11:00:00	2025-03-14 15:00:00
	5	Schwinn Cruiser	Cruiser Bike	8	2025-03-17 10:00:00	2025-03-17 12:00:00
	6	Rad Power RadRunner	Electric Bike	3	2025-03-12 14:00:00	2025-03-12 17:00:00
	7	Brompton M6L	Folding Bike	6	2025-03-15 13:00:00	2025-03-15 16:00:00
	8	Surly Long Haul Trucker	Touring Bike	7	2025-03-16 07:00:00	2025-03-16 19:00:00
	9	Kona Dew	Hybrid Bike	NULL	NULL	NULL
	10	Norco Bigfoot	Fat Bike	NULL	NULL	NULL

```
-- 4. Multiple JOINS: Get complete booking information with user, bike, and payment details
SELECT b.BookingID, u.Name AS UserName, u.Email, bk.Model AS BikeModel, bk.Type AS BikeType,
       b.StartTime, b.EndTime, b.TotalAmount, p.PaymentMethod, p.Status AS PaymentStatus
FROM Bookings b
JOIN Users u ON b.UserID = u.UserID
JOIN Bikes bk ON b.BikeID = bk.BikeID
JOIN Payments p ON b.BookingID = p.BookingID;
```

Result Grid										
Filter Rows:		Export:		Wrap Cell Contents:						
	BookingID	UserName	Email	BikeModel	BikeType	StartTime	EndTime	TotalAmount	PaymentMethod	PaymentStatus
▶	1	John Smith	john.smith@email.com	Cannondale Synapse	Road Bike	2025-03-10 10:00:00	2025-03-10 14:00:00	72.00	Credit Card	Completed
	2	Emma Johnson	emma.johnson@email.com	Trek FX 2	City Bike	2025-03-11 09:00:00	2025-03-11 12:00:00	37.50	PayPal	Completed
	3	Michael Brown	michael.brown@email.com	Rad Power RadRunner	Electric Bike	2025-03-12 14:00:00	2025-03-12 17:00:00	75.00	Debit Card	Completed
	4	Sophia Davis	sophia.davis@email.com	Specialized Rockhopper	Mountain Bike	2025-03-13 08:00:00	2025-03-13 12:00:00	60.00	Credit Card	Completed
	5	William Wilson	william.wilson@email.com	Giant Talon	Mountain Bike	2025-03-14 11:00:00	2025-03-14 15:00:00	58.00	PayPal	Completed
	6	Olivia Taylor	olivia.taylor@email.com	Brompton M6L	Folding Bike	2025-03-15 13:00:00	2025-03-15 16:00:00	60.00	Credit Card	Pending
	7	James Anderson	james.anderson@email.com	Surly Long Haul Trucker	Touring Bike	2025-03-16 07:00:00	2025-03-16 19:00:00	192.00	Debit Card	Pending
	8	Ava Martinez	ava.martinez@email.com	Schwinn Cruiser	Cruiser Bike	2025-03-17 10:00:00	2025-03-17 12:00:00	20.00	Cash	Pending
	10	Mia Rodriguez	mia.rodriguez@email.com	Trek FX 2	City Bike	2025-03-19 09:00:00	2025-03-19 13:00:00	50.00	PayPal	Pending

```
-- 1. Find users who have spent more than the average amount on bookings
SELECT u.UserID, u.Name, u.Email
FROM Users u
WHERE u.UserID IN (
    SELECT b.UserID
    FROM Bookings b
    GROUP BY b.UserID
    HAVING SUM(b.TotalAmount) > (
        SELECT AVG(TotalAmount) FROM Bookings
    )
);
```

Result Grid			
Filter Rows:		Edit:	
	UserID	Name	Email
▶	1	John Smith	john.smith@email.com
	3	Michael Brown	michael.brown@email.com
	7	James Anderson	james.anderson@email.com
•	NULL	NULL	NULL

```
-- 2. Find the most expensive bike type based on average hourly rate
SELECT Type, AVG(HourlyRate) as AvgRate
FROM Bikes
GROUP BY Type
HAVING AvgRate >= ALL (
    SELECT AVG(HourlyRate)
    FROM Bikes
    GROUP BY Type
);
```

Result Grid		
Filter Rows:		Export:
	Type	AvgRate
▶	Electric Bike	25.000000

```
-- 3. Find bikes that have never been booked
SELECT BikeID, Model, Type
FROM Bikes
WHERE BikeID NOT IN (
    SELECT DISTINCT BikeID FROM Bookings
);
```

Result Grid	Filter Rows:	Edit:	Export/Import:	Wrap Cell Content:
	BikeID	Model	Type	
	9	Kona Dew	Hybrid Bike	
	10	Norco Bigfoot	Fat Bike	
	NULL	NULL	NULL	

ER Diagram

