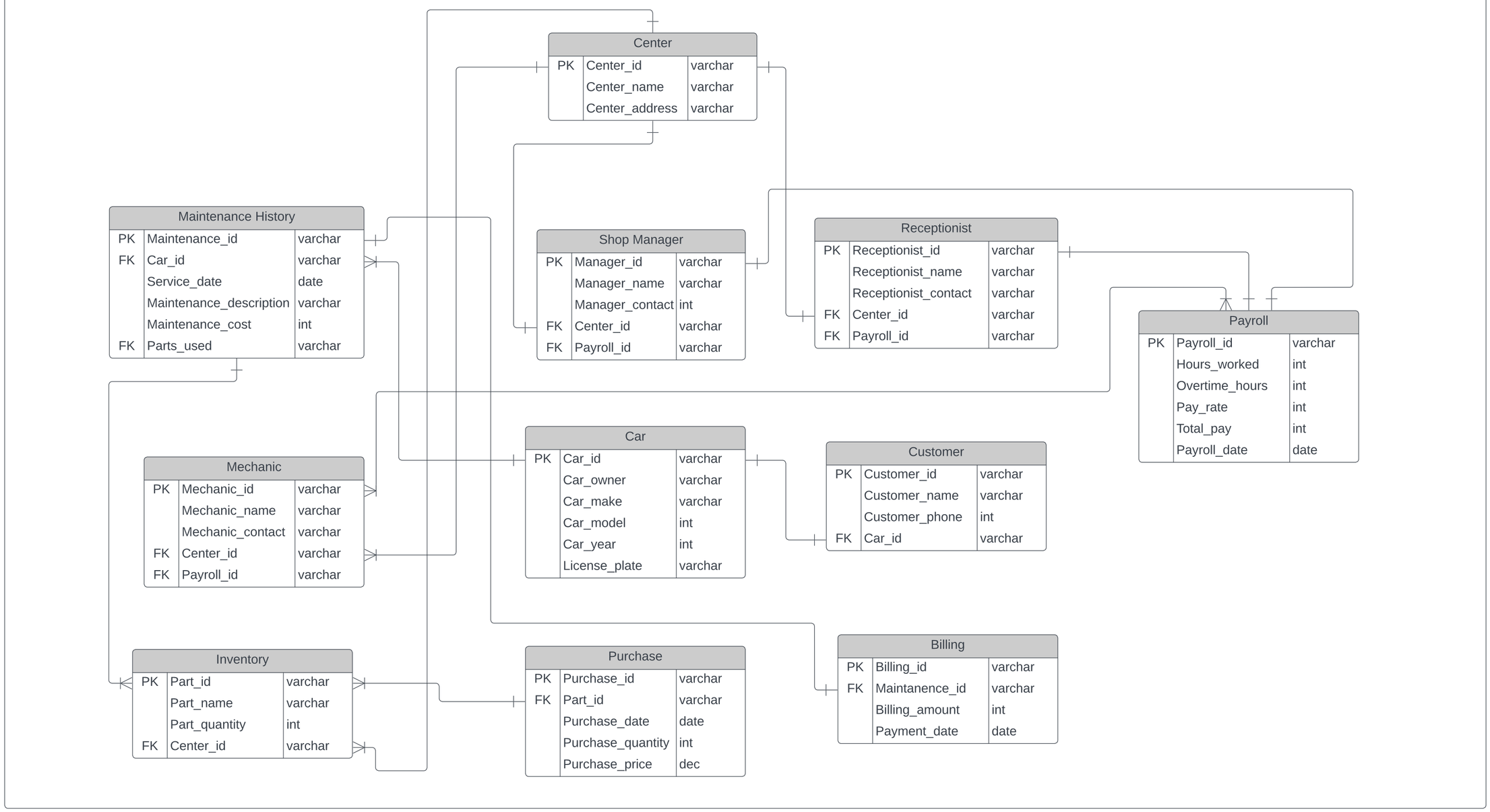
ABC Car Service Co.



Entity	Relationship	Entity	Connectivity
Center	Has	Shop Manager	1:1
Center	Has	Receptionist	1:1
Center	Has	Mechanics	1:N
Inventory	Associated to	Center	N:1
Car	Owned by	Customer	1:1
Car	Needs	Maintenance	1:1
Inventory	Used in	Maintenance	M:1
Inventory	Is	Purchased	M:1
Maintenance	Has	Billing	1:1
Payroll	Associated with	Shop Manager	1:1
Payroll	Associated with	Receptionist	1:1
Payroll	Associated with	Mechanic	1:N

Creating Tables and Inserting Data

SQL Individual Assignment

Fahad Ahmad

```
-- Table: Center
CREATE TABLE Center (
    center_id VARCHAR(2) PRIMARY KEY,
    center_name VARCHAR(255),
    center_address VARCHAR(255)
);

INSERT INTO Center (center_id, center_name, center_address) VALUES
('C1', 'Center 1', '123 Main St, City A, 12345');
INSERT INTO Center (center_id, center_name, center_address) VALUES
('C2', 'Center 2', '456 Elm St, City B, 67890');
INSERT INTO Center (center_id, center_name, center_address) VALUES
('C3', 'Center 3', '789 Oak St, City C, 23456');
```

```
CREATE TABLE Payroll (
    payroll_id VARCHAR(5) PRIMARY KEY,
    hours_worked INT,
    overtime_hours INT,
    pay_rate INT,
    total_pay INT,
    payroll_date DATE
);

INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY1', 8, 2, 20, 200,
'2023-03-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY2', 10, 3, 22, 253,
'2023-04-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY3', 9, 1, 18, 171,
'2023-04-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY4', 9, 2, 20, 220,
'2023-06-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY5', 8, 1, 22, 184,
'2023-08-01');
```

```
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY6', 10, 3, 18, 204,
'2023-09-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY7', 7, 1, 20, 154,
'2023-05-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY8', 8, 2, 22, 198,
'2023-12-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY9', 9, 2, 20, 220,
'2023-06-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY10', 8, 1, 22, 184,
'2023-12-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY11', 10, 3, 18, 204,
'2023-11-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY12', 7, 1, 20, 154,
'2023-10-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY13', 8, 2, 22, 198,
'2023-05-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY14', 9, 2, 20, 220,
'2023-01-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY15', 8, 1, 22, 184,
'2023-03-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY16', 10, 3, 18, 204,
'2023-02-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY17', 7, 1, 20, 154,
'2023-09-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY18', 8, 2, 22, 198,
'2023-08-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY19', 9, 2, 20, 220,
'2023-04-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY20', 8, 1, 22, 184,
'2023-10-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY21', 10, 3, 18, 204,
'2023-11-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY22', 7, 1, 20, 154,
'2023-08-01');
```

```
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY23', 8, 2, 22, 198,
'2023-11-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY24', 9, 2, 20, 220,
'2023-05-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY25', 8, 1, 22, 184,
'2023-06-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY26', 10, 3, 18, 204,
'2023-09-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY27', 7, 1, 20, 154,
'2023-07-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY28', 8, 2, 22, 198,
'2023-04-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY29', 9, 2, 20, 220,
'2023-05-01');
INSERT INTO Payroll (payroll_id, hours_worked, overtime_hours,
pay_rate, total_pay, payroll_date) VALUES ('PAY30', 8, 1, 22, 184,
'2023-12-01');
```

```
-- Table: ShopManager
CREATE TABLE ShopManager (
    manager_id VARCHAR(2) PRIMARY KEY,
    manager_name VARCHAR(255),
    manager_contact VARCHAR(100),
    center_id VARCHAR(2),
    payroll_id VARCHAR(10), -- Increase the size to 10 to accommodate
longer values
    FOREIGN KEY (center_id) REFERENCES Center(center_id),
    FOREIGN KEY (payroll_id) REFERENCES Payroll(payroll_id)
);

INSERT INTO ShopManager (manager_id, manager_name, manager_contact,
center_id, payroll_id) VALUES ('M1', 'John Smith',
'john@c1center.com', 'C1', 'PAY5');
INSERT INTO ShopManager (manager_id, manager_name, manager_contact,
center_id, payroll_id) VALUES ('M2', 'Jane Doe', 'jane@c2center.com',
'C2', 'PAY9');
INSERT INTO ShopManager (manager_id, manager_name, manager_contact,
center_id, payroll_id) VALUES ('M3', 'Mike Brown',
'mike@c3center.com', 'C3', 'PAY15');
```

```
-- Table: Receptionist
CREATE TABLE Receptionist (
    receptionist_id VARCHAR(2) PRIMARY KEY,
    receptionist_name VARCHAR(255),
    receptionist_contact VARCHAR(100), -- Change the data type to
VARCHAR for contact
    center_id VARCHAR(2),
    payroll_id VARCHAR(10), -- Increase the size to 10 to accommodate
longer values
    FOREIGN KEY (center_id) REFERENCES Center(center_id),
    FOREIGN KEY (payroll_id) REFERENCES Payroll(payroll_id)
);

INSERT INTO Receptionist (receptionist_id, receptionist_name,
receptionist_contact, center_id, payroll_id) VALUES ('R1', 'Mary
Johnson', 'mary@c1center.com', 'C1', 'PAY11');
INSERT INTO Receptionist (receptionist_id, receptionist_name,
receptionist_contact, center_id, payroll_id) VALUES ('R2', 'Sarah
White', 'sarah@c2center.com', 'C2', 'PAY26');
INSERT INTO Receptionist (receptionist_id, receptionist_name,
receptionist_contact, center_id, payroll_id) VALUES ('R3', 'Chris
Black', 'chris@c3center.com', 'C3', 'PAY17');
```

```
-- Table: Mechanic
CREATE TABLE Mechanic (
    mechanic_id VARCHAR(5) PRIMARY KEY,
    mechanic_name VARCHAR(255),
    mechanic_contact VARCHAR(255),
    center_id VARCHAR(5),
    payroll_id VARCHAR(5),
    FOREIGN KEY (center_id) REFERENCES Center(center_id),
    FOREIGN KEY (payroll_id) REFERENCES Payroll(payroll_id)
);

INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME1', 'Mark Davis',
'mark@c1center.com', 'C1', 'PAY1');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME2', 'Laura Wilson',
'laura@c2center.com', 'C2', 'PAY2');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME3', 'Paul Lee', 'paul@c3center.com',
'C3', 'PAY3');
```

```
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME4', 'Sarah Turner',
'sarah@c1center.com', 'C1', 'PAY4');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME5', 'David Clark',
'david@c2center.com', 'C2', 'PAY28');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME6', 'Jennifer White',
'jennifer@c3center.com', 'C3', 'PAY6');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME7', 'James Miller',
'james@c1center.com', 'C1', 'PAY7');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME8', 'Linda Johnson',
'linda@c3center.com', 'C3', 'PAY8');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME9', 'Michael Harris',
'michael@c1center.com', 'C1', 'PAY30');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME10', 'Jessica Turner',
'jessica@c2center.com', 'C2', 'PAY10');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME11', 'Richard Brown',
'richard@c3center.com', 'C3', 'PAY25');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME12', 'Emily Wilson',
'emily@c1center.com', 'C1', 'PAY12');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME13', 'Daniel Anderson',
'daniel@c2center.com', 'C2', 'PAY13');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME14', 'Maria Lee',
'maria@c3center.com', 'C3', 'PAY14');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME15', 'Jason Smith',
'jason@c1center.com', 'C1', 'PAY27');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME16', 'Laura Davis',
'laura@c3center.com', 'C3', 'PAY16');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME17', 'William Jones',
'william@c2center.com', 'C2', 'PAY29');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME18', 'Megan Martinez',
'megan@c1center.com', 'C1', 'PAY18');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME19', 'Robert Hall',
'robert@c3center.com', 'C3', 'PAY19');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME20', 'Sophia Green',
'sophia@c2center.com', 'C2', 'PAY20');
```

```
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME21', 'Christopher Kim',
'chris@c1center.com', 'C1', 'PAY21');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME22', 'Olivia Johnson',
'olivia@c3center.com', 'C3', 'PAY22');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME23', 'Benjamin Wright',
'benjamin@c2center.com', 'C2', 'PAY23');
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME24', 'Amelia Adams',
'amelia@c1center.com', 'C1', 'PAY24');
```

```
-- Table: Maintenance_History
CREATE TABLE Maintenance_History (
    maintenance_id VARCHAR(5) PRIMARY KEY,
    car_id VARCHAR(5),
    service_date DATE,
    maintenance_description VARCHAR(255),
    maintenance_cost INT(10),
    parts_used VARCHAR(255),
    FOREIGN KEY (car_id) REFERENCES Car(car_id)
);

INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M1',
'CAR1', '2023-01-05', 'Oil Change', 50, 'PART1, PART2');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M2',
'CAR1', '2023-02-10', 'Brake Repair', 200, 'PART3');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M3',
'CAR2', '2023-04-20', 'Tire Replacement', 300, 'PART4');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M4',
'CAR2', '2023-08-05', 'Oil Change', 60, 'PART1, PART3');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M5',
'CAR3', '2023-07-12', 'Brake Repair', 180, 'PART2');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M6',
'CAR1', '2023-08-20', 'Wheel Alignment', 75, 'PART4');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M7',
'CAR4', '2023-06-25', 'Transmission Overhaul', 400, 'PART5, PART6');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M8',
'CAR5', '2023-09-10', 'Tire Rotation', 30, 'PART7');
```

```
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M9',
'CAR2', '2023-07-01', 'AC Repair', 90, 'PART8');
INSERT INTO Maintenance_History (maintenance_id, car_id, service_date,
maintenance_description, maintenance_cost, parts_used) VALUES ('M10',
'CAR6', '2023-08-15', 'Engine Tune-up', 120, 'PART9, PART10');
```

```
CREATE TABLE Inventory (
    part_id VARCHAR(10) PRIMARY KEY,
    part_name VARCHAR(255),
    part_quantity INT(10),
    center_id VARCHAR(2),
    FOREIGN KEY (center_id) REFERENCES Center(center_id)
);


INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART1', 'Oil Filter', '100', 'C1');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART2', 'Air Filter', '150', 'C1');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART3', 'Brake Pads', '50', 'C1');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART4', 'Tires', '200', 'C2');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART5', 'Spark Plugs', '200', 'C2');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART6', 'Brake Fluid', '100', 'C2');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART7', 'Transmission Fluid', '50', 'C2');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART8', 'Serpentine Belts', '150', 'C3');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART9', 'Wiper Blades', '75', 'C3');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART10', 'Radiator Hoses', '60', 'C3');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART11', 'Oxygen Sensors', '30', 'C3');
INSERT INTO Inventory (part_id, part_name, part_quantity, center_id)
VALUES ('PART12', 'Engine Oil', '500', 'C3');
```

```
CREATE TABLE Car (
    car_id VARCHAR(10) PRIMARY KEY,
    car_owner VARCHAR(255),
    car_make VARCHAR(255),
    car_model VARCHAR(255),
    car_year INT(10),
```

```
    license_plate VARCHAR(20)
);

INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR1', 'Alice S.', 'Toyota', 'Camry', '2017',
'ABC123');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR2', 'Bob J.', 'Honda', 'Accord', '2018',
'XYZ456');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR3', 'Carol M.', 'Ford', 'Mustang', '2020',
'DEF789');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR4', 'Patricia R.', 'Chevrolet',
'Silverado', '2019', 'GHI789');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR5', 'William B.', 'Toyota', 'Corolla',
'2022', 'JKL012');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR6', 'Emma T.', 'Ford', 'Escape', '2018',
'MNO345');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR7', 'Liam H.', 'Honda', 'Civic', '2020',
'PQR678');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR8', 'Olivia K.', 'BMW', 'X5', '2021',
'STU901');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR9', 'Noah M.', 'Subaru', 'Outback', '2017',
'VWX234');
INSERT INTO Car (car_id, car_owner, car_make, car_model, car_year,
license_plate) VALUES ('CAR10', 'Ava L.', 'Hyundai', 'Elantra',
'2016', 'YZA567');
```

```
CREATE TABLE Purchase (
    purchase_id VARCHAR(5) PRIMARY KEY,
    part_id VARCHAR(10),
    purchase_date DATE,
    purchase_quantity INT,
    purchase_price DECIMAL(10, 2),
    FOREIGN KEY (part_id) REFERENCES Inventory(part_id)
);

INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P1', 'PART1', '2023-01-
05', 10, 5.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P2', 'PART2', '2023-02-
10', 20, 3.00);
```

```
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P3', 'PART3', '2023-04-
20', 5, 25.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P4', 'PART4', '2023-08-
05', 15, 10.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P5', 'PART5', '2023-07-
12', 30, 5.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P6', 'PART6', '2023-08-
20', 10, 7.50);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P7', 'PART7', '2023-06-
25', 20, 8.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P8', 'PART8', '2023-09-
10', 25, 12.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P9', 'PART9', '2023-07-
01', 40, 4.00);
INSERT INTO Purchase (purchase_id, part_id, purchase_date,
purchase_quantity, purchase_price) VALUES ('P10', 'PART10', '2023-08-
15', 15, 6.50);
```

```
CREATE TABLE Customer (
    customer_id VARCHAR(10) PRIMARY KEY,
    customer_name VARCHAR(255),
    customer_phone INT,
    car_id VARCHAR(5),
    FOREIGN KEY (car_id) REFERENCES Car(car_id)
);

INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST1', 'John Smith', 456789, 'CAR1');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST2', 'Mary Johnson', 987654, 'CAR2');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST3', 'David Williams', 321456, 'CAR3');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST4', 'Sarah Davis', 789123, 'CAR4');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST5', 'Robert Brown', 654321, 'CAR5');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST6', 'Jennifer Wilson', 234567, 'CAR6');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST7', 'William Lee', 876543, 'CAR7');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST8', 'Susan Miller', 543210, 'CAR8');
```

```
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST9', 'James Anderson', 345678, 'CAR9');
INSERT INTO Customer (customer_id, customer_name, customer_phone,
car_id) VALUES ('CUST10', 'Linda White', 678901, 'CAR10');
```

```
-- Table: Billing
CREATE TABLE Billing (
    billing_id VARCHAR(5) PRIMARY KEY,
    maintenance_id VARCHAR(5),
    billing_amount INT,
    payment_date DATE,
    FOREIGN KEY (maintenance_id) REFERENCES
Maintenance_History(maintenance_id)
);

INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B1', 'M1', 50, '2023-03-01');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B2', 'M2', 200, '2023-06-15');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B3', 'M3', 300, '2023-02-10');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B4', 'M4', 75, '2023-05-21');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B5', 'M5', 180, '2023-03-11');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B6', 'M6', 85, '2023-07-17');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B7', 'M7', 400, '2023-04-10');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B8', 'M8', 35, '2023-06-30');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B9', 'M9', 90, '2023-08-15');
INSERT INTO Billing (billing_id, maintenance_id, billing_amount,
payment_date) VALUES ('B10', 'M10', 120, '2023-06-30');
```

Queries

SQL Individual Assignment

Fahad Ahmad

Question 3

Query 1: Retrieve the names of all the shop managers

```
SELECT manager_name FROM ShopManager;
```

manager_name
John Smith
Jane Doe
Mike Brown

Record Count: 3; Execution Time: 9ms View Execution Plan link

Query 2: Find the center name and address for the receptionist with the ID 'R1'

```
1 SELECT Center.center_name, Center.center_address
2 FROM Receptionist
3 JOIN Center ON Receptionist.center_id = Center.center_id
4 WHERE Receptionist.receptionist_id = 'R1';
```

center_name	center_address
Center 1	123 Main St, City A, 12345

Record Count: 1; Execution Time: 16ms View Execution Plan link

Query 3: List the car owners who have cars with the word 'Ford' on the make

```
1 SELECT car_owner
2 FROM Car
3 WHERE car_make LIKE '%Ford%';
4
```

car_owner
Carol M.
Emma T.

Record Count: 2; Execution Time: 5ms View Execution Plan link

Query 4: Retrieve the maintenance descriptions and their costs for the car with license plate 'XYZ456'

```
1 SELECT maintenance_description, maintenance_cost
2 FROM Maintenance_History
3 WHERE car_id = 'CAR2';
4
5
```

maintenance_description	maintenance_cost
Tire Replacement	300
Oil Change	60
AC Repair	90

Record Count: 3; Execution Time: 9ms View Execution Plan link

Query 5: Find the part names and their quantities for the center with ID 'C2'

```sql
SELECT part_name, part_quantity
FROM Inventory
WHERE center_id = 'C2';
```

part_name	part_quantity
Tires	200
Spark Plugs	200
Brake Fluid	100
Transmission Fluid	50

Record Count: 4; Execution Time: 3ms View Execution Plan link

Query 6: Find the car owners and their phone numbers for cars that have 'Brake Repair' in their maintenance description

```sql
SELECT car_owner, customer_phone
FROM Car
JOIN Customer ON Car.car_id = Customer.car_id
WHERE Car.car_id IN (
    SELECT car_id
    FROM Maintenance_History
    WHERE maintenance_description LIKE '%Brake Repair%'
);
```

car_owner	customer_phone
Alice S.	456789
Carol M.	321456

Record Count: 2; Execution Time: 4ms View Execution Plan link

Query 7: To assign a mechanic to perform maintenance on a specific car

```
UPDATE Maintenance_History
SET mechanic_id = 'MECHANIC_ID'
WHERE maintenance_id = 'MAINTENANCE_ID';
```

We will replace mechanic id with a specific mechanic that we want to assign to a specific maintenance indicating that a specific mechanic is responsible for the maintenance of a particular car.

Query 8: Replace a receptionist

```
UPDATE Receptionist SET receptionist_name = 'New Receptionist',
receptionist_contact = 'new@c1center.com', payroll_id = 'PAY32' WHERE
receptionist_id = 'R1';
```

Query 9: Hire a New Mechanic

```
INSERT INTO Mechanic (mechanic_id, mechanic_name, mechanic_contact,
center_id, payroll_id) VALUES ('ME21', 'New Mechanic',
'new@c1center.com', 'C1', 'PAY31');
```

Query 10: Generate a Quote for Maintenance

```
SELECT
    MH.car_id,
    MH.maintenance_description,
    MH.maintenance_cost,
    IH.part_name,
    IH.part_quantity
FROM Maintenance_History MH
JOIN Inventory IH ON MH.parts_used = IH.part_id
WHERE MH.car_id = 'CAR3' AND MH.maintenance_description = 'Brake Repair';
```

car_id	maintenance_description	maintenance_cost	part_name	part_quantity
CAR3	Brake Repair	180	Air Filter	150

Record Count: 1; Execution Time: 10ms View Execution Plan link

Query 11: Generate a Final Bill for Maintenance

```
SELECT
    car_id,
    maintenance_description,
    SUM(part_quantity * maintenance_cost) AS total_cost
FROM (
    SELECT
        MH.car_id,
        MH.maintenance_description,
        MH.maintenance_cost,
        IH.part_quantity
    FROM Maintenance_History MH
    JOIN Inventory IH ON MH.parts_used = IH.part_id
    WHERE MH.car_id = 'CAR3' AND MH.maintenance_description = 'Brake Repair'
) AS subquery;
```

car_id	maintenance_description	total_cost
CAR3	Brake Repair	27000

Record Count: 1; Execution Time: 2ms View Execution Plan link

Query 12: Calculate how many hours was worked by a receptionist R2 and what is the payroll amount

```
1 SELECT
2     R.receptionist_id,
3     R.receptionist_name,
4     SUM(P.hours_worked) AS total_hours_worked,
5     SUM(P.total_pay) AS total_payroll_amount
6 FROM Receptionist R
7 JOIN Payroll P ON R.payroll_id = P.payroll_id
8 WHERE R.receptionist_id = 'R2'
9 GROUP BY R.receptionist_id, R.receptionist_name;
```

receptionist_id	receptionist_name	total_hours_worked	total_payroll_amount
R2	Sarah White	10	204

Record Count: 1; Execution Time: 10ms View Execution Plan link

Query 13: Retrieve Customer Information by Vehicle License Plate

```sql
SELECT c.customer_name, c.customer_phone, car.car_make, car.car_model
FROM Customer c
JOIN Car car ON c.car_id = car.car_id
WHERE car.license_plate = 'ABC123';
```

customer_name	customer_phone	car_make	car_model
John Smith	456789	Toyota	Camry

Record Count: 1; Execution Time: 8ms View Execution Plan link

Query 14: List the top 5 most frequently used car parts and their quantities

```sql
SELECT
    I.part_name,
    SUM(MH.maintenance_cost) AS total_cost
FROM Inventory AS I
JOIN Maintenance_History AS MH ON FIND_IN_SET(I.part_id, MH.parts_used)
GROUP BY I.part_name
ORDER BY total_cost DESC
LIMIT 5;
```

part_name	total_cost
Spark Plugs	400
Tires	375
Brake Pads	200
Air Filter	180
Wiper Blades	120

Record Count: 5; Execution Time: 14ms View Execution Plan link

Query 15: Calculate the average maintenance cost for each car make

```sql
SELECT
    C.car_make,
    AVG(MH.maintenance_cost) AS avg_maintenance_cost
FROM Car AS C
LEFT JOIN Maintenance_History AS MH ON C.car_id = MH.car_id
GROUP BY C.car_make
ORDER BY avg_maintenance_cost DESC;
```

car_make	avg_maintenance_cost
Chevrolet	400
Honda	150
Ford	150
Toyota	88.75
Hyundai	(null)
BMW	(null)
Subaru	(null)

Record Count: 7; Execution Time: 9ms View Execution Plan link

Some cars have not gone through maintenance which is why it is showing null.

Question 4

#Define Roles

CREATE ROLE mechanic_role;

CREATE ROLE receptionist_role;

CREATE ROLE manager_role;

#Grant Permissions to Roles

Mechanics

GRANT SELECT ON MaintenanceHistory, Car, Inventory TO mechanic_role;

Receptionists

GRANT SELECT, INSERT, UPDATE, DELETE ON Customer, Car TO receptionist_role;

GRANT SELECT ON MaintenanceHistory TO receptionist_role;

Managers

```
GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA public TO manager_role;


#Create Users

CREATE USER mechanic_user PASSWORD 'mechanic_password';

CREATE USER receptionist_user PASSWORD 'receptionist_password';

CREATE USER manager_user PASSWORD 'manager_password';


#Assign Roles to Users

GRANT mechanic_role TO mechanic_user;

GRANT receptionist_role TO receptionist_user;

GRANT manager_role TO manager_user;
```

Role Definition: Create roles (mechanic_role, receptionist_role, manager_role) to categorize users by their job roles.

Permission Assignment: Grant specific permissions to roles, such as SELECT, INSERT, UPDATE, DELETE, or ALL PRIVILEGES, to align with the responsibilities of Mechanics, Receptionists, and Shop Managers.

User Creation and Role Assignment: Create individual users and associate them with their respective roles to ensure they inherit the predefined permissions based on their roles.