**Course: CSGY-6083-Principles of Database Systems**

**Section: B**

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CONTENTS

[a) Logical E-R Model 3](#_Toc150710358)

[b) Relational Model 3](#_Toc150710359)

[c) Assumptions 4](#_Toc150710360)

[d) DDL Code 4](#_Toc150710361)

[e) Trigger Code 22](#_Toc150710362)

[f) Check Constraints DDL Code 22](#_Toc150710363)

[g) DML Code 23](#_Toc150710364)

[h) COUNT(\*) Query and Result 34](#_Toc150710365)

[i) Data Dictionary Queries 37](#_Toc150710366)

# Logical E-R Model

图示

描述已自动生成

# Relational Model

图示

描述已自动生成

# Assumptions

1. The Employee ID of the customer and the registration number of the corporation are both unique within a corporate account.
2. The driver license number of the customer is also unique within an individual account.
3. Discounts, whether individual or corporate, are applied manually by the staff at the time of renting a vehicle. Because the business case doesn't specify an automated system for applying discounts; hence, it's assumed that staff handles this process.
4. All individual customers are required to provide their own insurance information since the business case mentions that WOW does not provide vehicle insurance to individual customers, implying that customers need to have their own insurance.

# DDL Code

-- Generated by Oracle SQL Developer Data Modeler 23.1.0.087.0806

--   at:        2023-11-12 16:52:21 EST

--   site:      Oracle Database 11g

--   type:      Oracle Database 11g

-- predefined type, no DDL - MDSYS.SDO\_GEOMETRY

-- predefined type, no DDL - XMLTYPE

CREATE TABLE corporate (

--  customer id

    cust\_id   NUMBER(5) NOT NULL,

--  Employee ID of the customer who rents the car on a corporate account

    emp\_id    NUMBER(5) NOT NULL,

--  details of corporation name

    corp\_name VARCHAR2(30) NOT NULL,

--  registration number of the corporation

    reg\_no    VARCHAR2(9) NOT NULL

);

COMMENT ON COLUMN corporate.cust\_id IS

    'customer id';

COMMENT ON COLUMN corporate.emp\_id IS

    'Employee ID of the customer who rents the car on a corporate account';

COMMENT ON COLUMN corporate.corp\_name IS

    'details of corporation name';

COMMENT ON COLUMN corporate.reg\_no IS

    'registration number of the corporation';

ALTER TABLE corporate ADD CONSTRAINT corporate\_pk PRIMARY KEY ( cust\_id );

ALTER TABLE corporate ADD CONSTRAINT corporate\_pkv1 UNIQUE ( emp\_id );

CREATE TABLE discount\_corp (

--  discount id

    discount\_id NUMBER(5) NOT NULL,

--  percentage of discount offered for corporation

    disc\_perc   NUMBER(5, 2) NOT NULL,

--  corporation name

    corp\_name   VARCHAR2(30) NOT NULL

);

COMMENT ON COLUMN discount\_corp.discount\_id IS

    'discount id';

COMMENT ON COLUMN discount\_corp.disc\_perc IS

    'percentage of discount offered for corporation';

COMMENT ON COLUMN discount\_corp.corp\_name IS

    'corporation name';

ALTER TABLE discount\_corp ADD CONSTRAINT discount\_corp\_pk PRIMARY KEY ( discount\_id );

CREATE TABLE discount\_indi (

--  discount id

    discount\_id NUMBER(5) NOT NULL,

--  percentage of discount offered for individual

    disc\_perc   NUMBER(5, 2) NOT NULL,

--  discount coupon start date

    start\_date  DATE NOT NULL,

--  discount coupon end date

    end\_date    DATE NOT NULL

);

COMMENT ON COLUMN discount\_indi.discount\_id IS

    'discount id';

COMMENT ON COLUMN discount\_indi.disc\_perc IS

    'percentage of discount offered for individual';

COMMENT ON COLUMN discount\_indi.start\_date IS

    'discount coupon start date';

COMMENT ON COLUMN discount\_indi.end\_date IS

    'discount coupon end date';

ALTER TABLE discount\_indi ADD CONSTRAINT discount\_indi\_pk PRIMARY KEY ( discount\_id );

CREATE TABLE individual (

--  customer id

    cust\_id        NUMBER(5) NOT NULL,

--   Driver License Number

    drv\_license\_no VARCHAR2(12) NOT NULL,

--  Insurance Company Name

    ins\_cmp\_name   VARCHAR2(30) NOT NULL,

--  Insurance Policy Number

    ins\_pol\_no     VARCHAR2(13) NOT NULL

);

COMMENT ON COLUMN individual.cust\_id IS

    'customer id';

COMMENT ON COLUMN individual.drv\_license\_no IS

    ' Driver License Number';

COMMENT ON COLUMN individual.ins\_cmp\_name IS

    'Insurance Company Name';

COMMENT ON COLUMN individual.ins\_pol\_no IS

    'Insurance Policy Number';

ALTER TABLE individual ADD CONSTRAINT individual\_pk PRIMARY KEY ( cust\_id );

ALTER TABLE individual ADD CONSTRAINT individual\_pkv1 UNIQUE ( drv\_license\_no );

CREATE TABLE jc\_card\_type (

--  CARD TYPE ID

    card\_type\_id NUMBER(5) NOT NULL,

--  card type name

    type\_name    VARCHAR2(30) NOT NULL

);

COMMENT ON COLUMN jc\_card\_type.card\_type\_id IS

    'CARD TYPE ID';

COMMENT ON COLUMN jc\_card\_type.type\_name IS

    'card type name';

ALTER TABLE jc\_card\_type ADD CONSTRAINT jc\_card\_type\_pk PRIMARY KEY ( card\_type\_id );

CREATE TABLE jc\_customer (

--  customer id

    cust\_id    NUMBER(5) NOT NULL,

--  customer first name

    fname      VARCHAR2(30) NOT NULL,

--  customer last name

    lname      VARCHAR2(30) NOT NULL,

--  customer street

    street     VARCHAR2(30) NOT NULL,

--  customer city

    city       VARCHAR2(20) NOT NULL,

--  customer state

    state      VARCHAR2(30) NOT NULL,

--  customer zipcode

    zipcode    VARCHAR2(10) NOT NULL,

--  customer phone number

    phone\_no   VARCHAR2(12) NOT NULL,

--  customer email

    email      VARCHAR2(50) NOT NULL,

--  customer type

    cust\_type  VARCHAR2(1) NOT NULL,

--  service\_id

    service\_id NUMBER(5) NOT NULL

);

ALTER TABLE jc\_customer

    ADD CONSTRAINT ch\_inh\_jc\_customer CHECK ( cust\_type IN ( 'C', 'I' ) );

COMMENT ON COLUMN jc\_customer.cust\_id IS

    'customer id';

COMMENT ON COLUMN jc\_customer.fname IS

    'customer first name';

COMMENT ON COLUMN jc\_customer.lname IS

    'customer last name';

COMMENT ON COLUMN jc\_customer.street IS

    'customer street';

COMMENT ON COLUMN jc\_customer.city IS

    'customer city';

COMMENT ON COLUMN jc\_customer.state IS

    'customer state';

COMMENT ON COLUMN jc\_customer.zipcode IS

    'customer zipcode';

COMMENT ON COLUMN jc\_customer.phone\_no IS

    'customer phone number';

COMMENT ON COLUMN jc\_customer.email IS

    'customer email';

COMMENT ON COLUMN jc\_customer.cust\_type IS

    'customer type';

COMMENT ON COLUMN jc\_customer.service\_id IS

    'service\_id';

ALTER TABLE jc\_customer ADD CONSTRAINT jc\_customer\_pk PRIMARY KEY ( cust\_id );

CREATE TABLE jc\_discount (

--  discount id

    discount\_id   NUMBER(5) NOT NULL,

--  discount type

    discount\_type VARCHAR2(1) NOT NULL

);

ALTER TABLE jc\_discount

    ADD CONSTRAINT ch\_inh\_jc\_discount CHECK ( discount\_type IN ( 'C', 'I' ) );

COMMENT ON COLUMN jc\_discount.discount\_id IS

    'discount id';

COMMENT ON COLUMN jc\_discount.discount\_type IS

    'discount type';

ALTER TABLE jc\_discount ADD CONSTRAINT jc\_discount\_pk PRIMARY KEY ( discount\_id );

CREATE TABLE jc\_invoice (

--  Invoice id

    invoice\_id     NUMBER(5) NOT NULL,

--  INVOICE DATE

    invoice\_date   DATE NOT NULL,

--  INVOICE AMOUNT

    invoice\_amount NUMBER(7, 2) NOT NULL,

--  service id

    service\_id     NUMBER(5) NOT NULL

);

COMMENT ON COLUMN jc\_invoice.invoice\_id IS

    'Invoice id';

COMMENT ON COLUMN jc\_invoice.invoice\_date IS

    'INVOICE DATE';

COMMENT ON COLUMN jc\_invoice.invoice\_amount IS

    'INVOICE AMOUNT';

COMMENT ON COLUMN jc\_invoice.service\_id IS

    'service id';

ALTER TABLE jc\_invoice ADD CONSTRAINT jc\_invoice\_pk PRIMARY KEY ( invoice\_id );

CREATE TABLE jc\_loc (

--  office location

    loc\_id   NUMBER(4) NOT NULL,

--  office location street

    street   VARCHAR2(30) NOT NULL,

--  office location city

    city     VARCHAR2(30) NOT NULL,

--  location state

    state    VARCHAR2(30) NOT NULL,

--  office location zipcode

    zipcode  VARCHAR2(10) NOT NULL,

--  office phone number

    phone\_no VARCHAR2(12) NOT NULL

);

COMMENT ON COLUMN jc\_loc.loc\_id IS

    'office location';

COMMENT ON COLUMN jc\_loc.street IS

    'office location street';

COMMENT ON COLUMN jc\_loc.city IS

    'office location city';

COMMENT ON COLUMN jc\_loc.state IS

    'office location state';

COMMENT ON COLUMN jc\_loc.zipcode IS

    'office location zipcode';

COMMENT ON COLUMN jc\_loc.phone\_no IS

    'office phone number';

ALTER TABLE jc\_loc ADD CONSTRAINT jc\_loc\_pk PRIMARY KEY ( loc\_id );

CREATE TABLE jc\_payment (

--  PAYMENT ID

    payment\_id   NUMBER(5) NOT NULL,

--  PAYMENT DATE

    payment\_date DATE NOT NULL,

--  card number

    card\_no      NUMBER(16) NOT NULL,

--  invoice id

    invoice\_id   NUMBER(5) NOT NULL,

--  card type id

    card\_type\_id NUMBER(5) NOT NULL

);

COMMENT ON COLUMN jc\_payment.payment\_id IS

    'PAYMENT ID';

COMMENT ON COLUMN jc\_payment.payment\_date IS

    'PAYMENT DATE';

COMMENT ON COLUMN jc\_payment.card\_no IS

    'card number';

COMMENT ON COLUMN jc\_payment.invoice\_id IS

    'invoice id';

COMMENT ON COLUMN jc\_payment.card\_type\_id IS

    'card type id';

ALTER TABLE jc\_payment ADD CONSTRAINT jc\_payment\_pk PRIMARY KEY ( payment\_id );

CREATE TABLE jc\_service (

--  rent service id

    service\_id  NUMBER(5) NOT NULL,

--  rent service days number

    days\_no     NUMBER(2) NOT NULL,

--  rent service start odometer

    start\_odo   NUMBER(6) NOT NULL,

--  rent service end odometer

    end\_odo     NUMBER(6) NOT NULL,

--  pickup location

    pickup\_loc  NUMBER(4) NOT NULL,

--  dropoff location

    dropoff\_loc NUMBER(4) NOT NULL,

--  discount id

    discount\_id NUMBER(5) NOT NULL

);

COMMENT ON COLUMN jc\_service.service\_id IS

    'rent service id';

COMMENT ON COLUMN jc\_service.days\_no IS

    'rent service days number';

COMMENT ON COLUMN jc\_service.start\_odo IS

    'rent service start odometer';

COMMENT ON COLUMN jc\_service.end\_odo IS

    'rent service end odometer';

COMMENT ON COLUMN jc\_service.pickup\_loc IS

    'pickup location';

COMMENT ON COLUMN jc\_service.dropoff\_loc IS

    'dropoff location';

COMMENT ON COLUMN jc\_service.discount\_id IS

    'discount id';

CREATE UNIQUE INDEX jc\_service\_\_idx ON

    jc\_service (

        discount\_id

    ASC );

ALTER TABLE jc\_service ADD CONSTRAINT jc\_service\_pk PRIMARY KEY ( service\_id );

CREATE TABLE jc\_vehicle (

--  Vehicle Identification Number

    vehicle\_vin      VARCHAR2(17) NOT NULL,

--  VEHICLE MAKE

    vehicle\_make     VARCHAR2(30) NOT NULL,

--  VEHICLE MODEL

    vehicle\_model    VARCHAR2(30) NOT NULL,

--  VEHICLE YEAR

    vehicle\_year     NUMBER(4) NOT NULL,

--  LICENSE PLATE NUMBER

    license\_plate\_no VARCHAR2(8) NOT NULL,

--  location id

    loc\_id           NUMBER(4) NOT NULL,

--  vehicle id

    vehicle\_id       NUMBER(5) NOT NULL

);

COMMENT ON COLUMN jc\_vehicle.vehicle\_vin IS

    'Vehicle Identification Number';

COMMENT ON COLUMN jc\_vehicle.vehicle\_make IS

    'VEHICLE MAKE';

COMMENT ON COLUMN jc\_vehicle.vehicle\_model IS

    'VEHICLE MODEL';

COMMENT ON COLUMN jc\_vehicle.vehicle\_year IS

    'VEHICLE YEAR';

COMMENT ON COLUMN jc\_vehicle.license\_plate\_no IS

    'LICENSE PLATE NUMBER';

COMMENT ON COLUMN jc\_vehicle.loc\_id IS

    'location id';

COMMENT ON COLUMN jc\_vehicle.vehicle\_id IS

    'vehicle id';

ALTER TABLE jc\_vehicle ADD CONSTRAINT jc\_vehicle\_pk PRIMARY KEY ( vehicle\_vin );

CREATE TABLE jc\_vehicle\_class (

--  vehicle class id

    vehicle\_id        NUMBER(5) NOT NULL,

--  vehicle type

    vehicle\_type      VARCHAR2(30) NOT NULL,

--  rental rate per day

    daily\_rate        NUMBER(5, 2) NOT NULL,

--  fees for over mileage per day

    over\_mileage\_rate NUMBER(4, 2) NOT NULL,

--  odometer limit

    odo\_limit         NUMBER(4) NOT NULL,

--  service id

    service\_id        NUMBER(5) NOT NULL

);

COMMENT ON COLUMN jc\_vehicle\_class.vehicle\_id IS

    'vehicle class id';

COMMENT ON COLUMN jc\_vehicle\_class.vehicle\_type IS

    'vehicle type';

COMMENT ON COLUMN jc\_vehicle\_class.daily\_rate IS

    'rental rate per day';

COMMENT ON COLUMN jc\_vehicle\_class.over\_mileage\_rate IS

    'fees for over mileage per day';

COMMENT ON COLUMN jc\_vehicle\_class.odo\_limit IS

    'odometer limit';

COMMENT ON COLUMN jc\_vehicle\_class.service\_id IS

    'service id';

ALTER TABLE jc\_vehicle\_class ADD CONSTRAINT jc\_vehicle\_class\_pk PRIMARY KEY ( vehicle\_id );

ALTER TABLE corporate

    ADD CONSTRAINT corporate\_jc\_customer\_fk FOREIGN KEY ( cust\_id )

        REFERENCES jc\_customer ( cust\_id );

ALTER TABLE discount\_corp

    ADD CONSTRAINT discount\_corp\_jc\_discount\_fk FOREIGN KEY ( discount\_id )

        REFERENCES jc\_discount ( discount\_id );

ALTER TABLE discount\_indi

    ADD CONSTRAINT discount\_indi\_jc\_discount\_fk FOREIGN KEY ( discount\_id )

        REFERENCES jc\_discount ( discount\_id );

ALTER TABLE individual

    ADD CONSTRAINT individual\_jc\_customer\_fk FOREIGN KEY ( cust\_id )

        REFERENCES jc\_customer ( cust\_id );

ALTER TABLE jc\_customer

    ADD CONSTRAINT jc\_customer\_jc\_service\_fk FOREIGN KEY ( service\_id )

        REFERENCES jc\_service ( service\_id );

ALTER TABLE jc\_invoice

    ADD CONSTRAINT jc\_invoice\_jc\_service\_fk FOREIGN KEY ( service\_id )

        REFERENCES jc\_service ( service\_id );

ALTER TABLE jc\_payment

    ADD CONSTRAINT jc\_payment\_jc\_card\_type\_fk FOREIGN KEY ( card\_type\_id )

        REFERENCES jc\_card\_type ( card\_type\_id );

ALTER TABLE jc\_payment

    ADD CONSTRAINT jc\_payment\_jc\_invoice\_fk FOREIGN KEY ( invoice\_id )

        REFERENCES jc\_invoice ( invoice\_id );

ALTER TABLE jc\_service

    ADD CONSTRAINT jc\_service\_jc\_discount\_fk FOREIGN KEY ( discount\_id )

        REFERENCES jc\_discount ( discount\_id );

ALTER TABLE jc\_service

    ADD CONSTRAINT jc\_service\_jc\_loc\_fk FOREIGN KEY ( pickup\_loc )

        REFERENCES jc\_loc ( loc\_id );

ALTER TABLE jc\_service

    ADD CONSTRAINT jc\_service\_jc\_loc\_fkv2 FOREIGN KEY ( dropoff\_loc )

        REFERENCES jc\_loc ( loc\_id );

ALTER TABLE jc\_vehicle\_class

    ADD CONSTRAINT jc\_vehicle\_class\_jc\_service\_fk FOREIGN KEY ( service\_id )

        REFERENCES jc\_service ( service\_id );

ALTER TABLE jc\_vehicle

    ADD CONSTRAINT jc\_vehicle\_jc\_loc\_fk FOREIGN KEY ( loc\_id )

        REFERENCES jc\_loc ( loc\_id );

ALTER TABLE jc\_vehicle

    ADD CONSTRAINT jc\_vehicle\_jc\_vehicle\_class\_fk FOREIGN KEY ( vehicle\_id )

        REFERENCES jc\_vehicle\_class ( vehicle\_id );

CREATE OR REPLACE TRIGGER arc\_fkarc\_4\_corporate BEFORE

    INSERT OR UPDATE OF cust\_id ON corporate

    FOR EACH ROW

DECLARE

    d VARCHAR2(1);

BEGIN

    SELECT

        a.cust\_type

    INTO d

    FROM

        jc\_customer a

    WHERE

        a.cust\_id = :new.cust\_id;

    IF ( d IS NULL OR d <> 'C' ) THEN

        raise\_application\_error(-20223, 'FK CORPORATE\_JC\_CUSTOMER\_FK in Table CORPORATE violates Arc constraint on Table JC\_CUSTOMER - discriminator column CUST\_TYPE doesn''t have value ''C'''

        );

    END IF;

EXCEPTION

    WHEN no\_data\_found THEN

        NULL;

    WHEN OTHERS THEN

        RAISE;

END;

/

CREATE OR REPLACE TRIGGER arc\_fkarc\_4\_individual BEFORE

    INSERT OR UPDATE OF cust\_id ON individual

    FOR EACH ROW

DECLARE

    d VARCHAR2(1);

BEGIN

    SELECT

        a.cust\_type

    INTO d

    FROM

        jc\_customer a

    WHERE

        a.cust\_id = :new.cust\_id;

    IF ( d IS NULL OR d <> 'I' ) THEN

        raise\_application\_error(-20223, 'FK INDIVIDUAL\_JC\_CUSTOMER\_FK in Table INDIVIDUAL violates Arc constraint on Table JC\_CUSTOMER - discriminator column CUST\_TYPE doesn''t have value ''I'''

        );

    END IF;

EXCEPTION

    WHEN no\_data\_found THEN

        NULL;

    WHEN OTHERS THEN

        RAISE;

END;

/

CREATE OR REPLACE TRIGGER arc\_fkarc\_5\_discount\_indi BEFORE

    INSERT OR UPDATE OF discount\_id ON discount\_indi

    FOR EACH ROW

DECLARE

    d VARCHAR2(1);

BEGIN

    SELECT

        a.discount\_type

    INTO d

    FROM

        jc\_discount a

    WHERE

        a.discount\_id = :new.discount\_id;

    IF ( d IS NULL OR d <> 'I' ) THEN

        raise\_application\_error(-20223, 'FK DISCOUNT\_INDI\_JC\_DISCOUNT\_FK in Table DISCOUNT\_INDI violates Arc constraint on Table JC\_DISCOUNT - discriminator column DISCOUNT\_TYPE doesn''t have value ''I'''

        );

    END IF;

EXCEPTION

    WHEN no\_data\_found THEN

        NULL;

    WHEN OTHERS THEN

        RAISE;

END;

/

CREATE OR REPLACE TRIGGER arc\_fkarc\_5\_discount\_corp BEFORE

    INSERT OR UPDATE OF discount\_id ON discount\_corp

    FOR EACH ROW

DECLARE

    d VARCHAR2(1);

BEGIN

    SELECT

        a.discount\_type

    INTO d

    FROM

        jc\_discount a

    WHERE

        a.discount\_id = :new.discount\_id;

    IF ( d IS NULL OR d <> 'C' ) THEN

        raise\_application\_error(-20223, 'FK DISCOUNT\_CORP\_JC\_DISCOUNT\_FK in Table DISCOUNT\_CORP violates Arc constraint on Table JC\_DISCOUNT - discriminator column DISCOUNT\_TYPE doesn''t have value ''C'''

        );

    END IF;

EXCEPTION

    WHEN no\_data\_found THEN

        NULL;

    WHEN OTHERS THEN

        RAISE;

END;

/

-- Oracle SQL Developer Data Modeler Summary Report:

--

-- CREATE TABLE                            13

-- CREATE INDEX                             1

-- ALTER TABLE                             31

-- CREATE VIEW                              0

-- ALTER VIEW                               0

-- CREATE PACKAGE                           0

-- CREATE PACKAGE BODY                      0

-- CREATE PROCEDURE                         0

-- CREATE FUNCTION                          0

-- CREATE TRIGGER                           4

-- ALTER TRIGGER                            0

-- CREATE COLLECTION TYPE                   0

-- CREATE STRUCTURED TYPE                   0

-- CREATE STRUCTURED TYPE BODY              0

-- CREATE CLUSTER                           0

-- CREATE CONTEXT                           0

-- CREATE DATABASE                          0

-- CREATE DIMENSION                         0

-- CREATE DIRECTORY                         0

-- CREATE DISK GROUP                        0

-- CREATE ROLE                              0

-- CREATE ROLLBACK SEGMENT                  0

-- CREATE SEQUENCE                          0

-- CREATE MATERIALIZED VIEW                 0

-- CREATE MATERIALIZED VIEW LOG             0

-- CREATE SYNONYM                           0

-- CREATE TABLESPACE                        0

-- CREATE USER                              0

--

-- DROP TABLESPACE                          0

-- DROP DATABASE                            0

--

-- REDACTION POLICY                         0

--

-- ORDS DROP SCHEMA                         0

-- ORDS ENABLE SCHEMA                       0

-- ORDS ENABLE OBJECT                       0

--

-- ERRORS                                   0

-- WARNINGS                                 0

# Trigger Code

CREATE OR REPLACE TRIGGER calculate\_invoice

BEFORE INSERT ON jc\_invoice

FOR EACH ROW

DECLARE

    v\_daily\_rate        NUMBER(5, 2);

    v\_over\_mileage\_rate NUMBER(4, 2);

    v\_extra\_miles       NUMBER(6);

BEGIN

    -- Get the daily rate and over mileage rate for the associated vehicle class

    SELECT vc.daily\_rate, vc.over\_mileage\_rate

    INTO v\_daily\_rate, v\_over\_mileage\_rate

    FROM jc\_vehicle\_class vc

    WHERE vc.service\_id = (SELECT service\_id FROM jc\_service WHERE service\_id = :NEW.service\_id);

    -- Calculate the number of extra miles

    SELECT GREATEST(end\_odo - start\_odo - (days\_no \* vc.odo\_limit), 0)

    INTO v\_extra\_miles

    FROM jc\_service

    WHERE service\_id = :NEW.service\_id;

    -- Calculate the invoice amount

    :NEW.invoice\_amount := (:NEW.days\_no \* v\_daily\_rate) + (v\_extra\_miles \* v\_over\_mileage\_rate);

END;

/

# Check Constraints DDL Code

ALTER TABLE discount\_indi

ADD CONSTRAINT DiscountDate CHECK (start\_date <= end\_date);

ALTER TABLE jc\_vehicle\_class

ADD CONSTRAINT Rate CHECK (daily\_rate > 0 AND over\_mileage\_rate > 0 AND odo\_limit > 0);

ALTER TABLE jc\_invoice

ADD CONSTRAINT InvoiceAmount CHECK (invoice\_amount >= 0);

ALTER TABLE jc\_payment

ADD CONSTRAINT PaymentDate CHECK (payment\_date <= SYSDATE);

ALTER TABLE Invoice

ADD CONSTRAINT InvoiceDate CHECK (invoice\_date <= SYSDATE);

ALTER TABLE corporate

ADD CONSTRAINT UniqueRegNo UNIQUE (reg\_no);

ALTER TABLE corporate

ADD CONSTRAINT UniqueEMPID UNIQUE (emp\_id);

ALTER TABLE jc\_payment

ADD CONSTRAINT InvoicePaymentDate CHECK (invoice\_date <= payment\_date);

# DML Code

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (1, 'Jersey City', '201 PROSPECT ST', 'NJ', '07306', '735-428-8435');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (2, 'Manhattan', '456 Elm Street', 'NY', '10013', '542-416-1864');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (3, 'San Diego', '3881 SEDGWICK AVE', 'CA', '92101', '743-410-3542');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (4, 'Modesto', '1 BARBARA RD', 'OH', '95354', '150-348-8020');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (5, 'Riverside', '107 CLARENDON RD', 'MN', '92501', '848-181-4610');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (6, 'Anaheim', '1 VERNON ST', 'GA', '92803', '105-543-3570');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (7, 'Irvine', '150 BRABANT ST', 'FL', '92612', '135-654-3418');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (8, 'Fresno', '6 W 107TH ST', 'CT', '93701', '843-420-2345');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (9, 'Long Beach', '35 TRENT CT', 'SD', '90801', '405-345-3458');

INSERT INTO jc\_loc (loc\_id, city, street, state, zipcode, phone\_no) VALUES (10, 'Los Angeles', '13 Main Street', 'LA', '90802', '435-802-1505')

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (1, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (2, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (3, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (4, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (5, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (6, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (7, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (8, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (9, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (10, 'C');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (11, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (12, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (13, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (14, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (15, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (16, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (17, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (18, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (19, 'I');

INSERT INTO jc\_discount (discount\_id, discount\_type) VALUES (20, 'I');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (1, 10, 'Acme Corporation');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (2, 15, 'Initech');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (3, 20, 'Wayne Enterprises');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (4, 25,  'LexCorp');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (5, 30, 'Stark Industries');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (6, 35, 'Umbrella Corporation');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (7, 40, 'Google');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (8, 45, 'Microsoft');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (9, 50, 'Apple');

INSERT INTO discount\_corp (discount\_id, disc\_perc, corp\_name) VALUES (10, 55, 'Amazon');

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (11, 60, TO\_DATE('08/01/2023', 'MM/DD/YYYY'), TO\_DATE('11/21/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (12, 65, TO\_DATE('09/10/2023', 'MM/DD/YYYY'), TO\_DATE('12/25/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (13, 15, TO\_DATE('10/01/2023', 'MM/DD/YYYY'), TO\_DATE('11/18/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (14, 25, TO\_DATE('10/08/2023', 'MM/DD/YYYY'), TO\_DATE('11/24/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (15, 12, TO\_DATE('10/15/2023', 'MM/DD/YYYY'), TO\_DATE('11/25/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (16, 35, TO\_DATE('10/23/2023', 'MM/DD/YYYY'), TO\_DATE('11/29/2023', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (17, 11, TO\_DATE('11/01/2023', 'MM/DD/YYYY'), TO\_DATE('01/21/2024', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (18, 18, TO\_DATE('11/01/2023', 'MM/DD/YYYY'), TO\_DATE('01/27/2024', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (19, 22, TO\_DATE('11/01/2023', 'MM/DD/YYYY'), TO\_DATE('01/25/2024', 'MM/DD/YYYY'));

INSERT INTO discount\_indi (discount\_id, disc\_perc, start\_date, end\_date) VALUES (20, 16, TO\_DATE('11/01/2023', 'MM/DD/YYYY'), TO\_DATE('02/12/2024', 'MM/DD/YYYY'));

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (1, 2, 10000, 10500, 1, 2, 1);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (2, 1, 12000, 12700, 3, 4, 2);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (3, 2, 14000, 14500, 5, 6, 3);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (4, 6, 16000, 16700, 7, 8, 4);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (5, 2, 18000, 18500, 9, 10, 5);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (6, 3, 20000, 20700, 1, 3, 6);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (7, 5, 22000, 22700, 3, 5, 7);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (8, 3, 24000, 24700, 5, 10, 8);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (9, 2, 26000, 26700, 7, 9, 9);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (10, 7, 28000, 29000, 4, 1, 10);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (11, 2, 30000, 30800, 5, 7, 11);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (12, 5, 50000, 52000, 2, 8, 12);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (13, 2, 58000, 58500, 9, 1, 13);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (14, 4, 84000, 86000, 8, 1, 14);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (15, 2, 95000, 96500, 4, 7, 15);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (16, 7, 18000, 19000, 10, 1, 16);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (17, 2, 10000, 10800, 5, 7, 17);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (18, 5, 20000, 22000, 2, 8, 18);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (19, 2, 78000, 78500, 9, 1, 19);

INSERT INTO jc\_service (service\_id, days\_no, start\_odo, end\_odo, pickup\_loc, dropoff\_loc, discount\_id) VALUES (20, 4, 64000, 66000, 8, 1, 20);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (1, 'David', 'Doe', '123 Main Street', 'Los Angeles', 'CA', 14886, '123-456-7890', 'David.Doe@example.com', 'C', 1);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (2, 'Jane', 'Brown', '456 Elm Street', 'Jersey City', 'NJ', 59641, '987-654-3210', 'Jane.Brown@example.com', 'C', 6);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (3, 'Mary', 'Williams', '789 Oak Street', 'San Diego', 'CA', 23233, '987-453-3210', 'Mary.Williams@example.com', 'C', 10);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (4, 'Linda', 'Smith', '1 SAGE PL', 'Manhanttan', 'NY', 16642, '456-789-0183', 'Linda.Smith@example.com', 'C', 3);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (5, 'Patricia', 'Brown', '900 AVENUE C', 'Fresno', 'CA', 69840, '456-754-0123', 'Patricia.Brown@example.com', 'C', 7);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (6, 'Jane', 'Garcia', '301 HULSE LANDING RD', 'Modesto', 'CA', 54530, '987-654-8643', 'Jane.Garcia@example.com', 'C', 4);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (7, 'William', 'Williams', '1125 ROUTE 112', 'Riverside', 'CA', 84818, '789-012-3456', 'William.Williams@example.com', 'C', 8);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (8, 'David', 'Brown', '700 GARNSEY RD', 'Long Beach', 'CA', 90106, '789-012-8466', 'David.Brown@example.com', 'C', 5);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (9, 'Susan', 'Williams', '8 TWISTING DR', 'Anaheim', 'CA', 41109, '184-456-7890', 'Susan.Williams@example.com', 'C', 9);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (10, 'William', 'Jones', '9162 HIGH BRIDGE RD', 'Irvine', 'CA', 68815, '789-012-4256', 'William.Jones@example.com', 'C', 2);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (11, 'Emily', 'Davis', '2436 Naples Avenue', 'Panama City', 'FL', 32405, '133-456-7890', 'Emily.Davis@example.com', 'I', 11);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (12, 'Ryan', 'Mitchell', '1030 E Main St', 'Benton Harbor', 'MI', 49022, '438-654-3210', 'Ryan.Mitchell@example.com', 'I', 16);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (13, 'Olivia', 'Garcia', '244 W 109TH ST', 'Brooklyn', 'NY', 10025, '450-654-3210', 'Olivia.Garcia@example.com', 'I', 20);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (14, 'Ethan', 'Anderson', '1561 SHERIDAN AVE', 'Manhanttan', 'NY', 16642, '843-789-0123', 'Ethan.Anderson@example.com', 'I', 13);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (15, 'Ava', 'Taylor', '301 CAROLINE ST', 'Fresno', 'CA', 69840, '456-108-0123', 'Ava.Taylor@example.com', 'I', 17);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (16, 'Benjamin', 'Martinez', '5400 DUNNING AVE', 'Modesto', 'CA', 54530, '987-435-3210', 'Benjamin.Martinez@example.com', 'I', 14);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (17, 'Sophia', 'Brown', '73 LINDEN ST', 'Riverside', 'CA', 84818, '789-012-4851', 'Sophia.Brown@example.com', 'I', 18);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (18, 'Jackson', 'Wright', '30 SAINT JOHN ST', 'Long Beach', 'CA', 90106, '789-012-4350', 'Jackson.Wright@example.com', 'I', 15);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (19, 'Mia', 'Robinson', '482 VAN DUZER ST', 'Anaheim', 'CA', 41109, '123-456-1571', 'Mia.Robinson@example.com', 'I', 19);

INSERT INTO jc\_customer (cust\_id, fname, lname, street, city, state, zipcode, phone\_no, email, cust\_type, service\_id) VALUES (20, 'Noah', 'Adams', '723 BROWN ST', 'Irvine', 'CA', 68815, '789-012-4287', 'Noah.Adams@example.com', 'I', 12);

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (1, 101, 'Acme Corporation', '123456789');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (2, 102, 'Initech', '987654321');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (3, 103, 'Wayne Enterprises', '098765432');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (4, 104, 'LexCorp', '321654987');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (5, 105, 'Stark Industries', '765432198');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (6, 106, 'Umbrella Corporation', '321456789');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (7, 107, 'Google', '987321654');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (8, 108, 'Microsoft', '098216543');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (9, 109, 'Apple', '216549873');

INSERT INTO corporate (cust\_id, emp\_id, corp\_name, reg\_no) VALUES (10, 110, 'Amazon', '654321987');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (11, '67890', 'American Family Insurance', '0165000498730');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (12, '01234', 'Mercury Insurance', '0543000219870');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (13, '56789', 'Nationwide General Insurance', '0894500061230');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (14, '90123', 'Erie Insurance Exchange', '9076594643210');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (15, '23456', 'SFMA Insurance Company', '1234567000890');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (16, '78901', 'PM Insurance Company', '9076500043210');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (17, '12340', 'GG Insurance Company', '0980650004320');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (18, '67895', 'APC Insurance Company', '2105490008730');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (19, '85231', 'USAAC Insurance Company', '6543219000870');

INSERT INTO individual (cust\_id, drv\_license\_no, ins\_cmp\_name, ins\_pol\_no) VALUES (20, '23450', 'NM Insurance Company', '8894561200030');

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (1, 'Economy', 50.00, 1.00, 100, 1);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (2, 'Compact', 40.00, 1.00, 150, 2);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (3, 'Midsize', 55.00, 2.00, 200, 3);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (4, 'Fullsize', 65.00, 2.00, 250, 4);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (5, 'SUV', 70.00, 2.00, 300, 5);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (6, 'Van', 50.00, 2.00, 350, 6);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (7, 'Luxury', 75.00, 3.00, 400, 7);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (8, 'Sports', 60.00, 1.00, 200, 8);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (9, 'Exotic', 70.00, 4.00, 500, 9);

INSERT INTO jc\_vehicle\_class (vehicle\_id, vehicle\_type, daily\_rate, over\_mileage\_rate, odo\_limit, service\_id) VALUES (10, 'Unlimited', 50.00, 2.00, 200, 10);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('34645433723964390', 'Toyota', 'Elantra', 2023, 'JKL04420', 2, 9);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('64548180238807220', 'Toyota', 'Camry', 2020, 'DEF45600', 1, 1);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('25242520074326360', 'Honda', 'Elantra', 2023, 'JKL01200', 3, 3);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('20635667483605990', 'Toyota', 'Camry', 2023, 'GHI78900', 4, 6);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('77807017992587660', 'Honda', 'Accord', 2022, 'ABC12300', 1, 2);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('93972144626475160', 'Honda', 'Accord', 2021, 'GHI74055', 1, 4);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('93630501216869070', 'Hyundai', 'Altima', 2020, 'JKL00570', 3, 5);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('38068192468764550', 'Honda', 'Elantra', 2022, 'GHI74020', 2, 4);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('96000604123026110', 'Toyota', 'Altima', 2021, 'JKL04050', 1, 6);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('88558226746779550', 'Honda', 'Elantra', 2021, 'JKL05000', 4, 5);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('84759324439018280', 'Honda', 'Camry', 2022, 'ABC17600', 4, 1);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('18802705293939440', 'Nissan', 'Altima', 2023, 'JKL04100', 2, 10);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('70108202227182780', 'Nissan', 'Camry', 2022, 'DEF50542', 1, 5);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('56473604679613320', 'Honda', 'Accord', 2022, 'DEF18105', 3, 7);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('91044619254230110', 'Hyundai', 'Camry', 2021, 'DEF40273', 5, 6);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('96476313716194310', 'Honda', 'Altima', 2023, 'ABC10573', 3, 1);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('56710278506513240', 'Hyundai', 'Accord', 2023, 'GHI46020', 4, 2);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('36417030095670650', 'Toyota', 'Elantra', 2020, 'GHI71010', 2, 2);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('40061061306428900', 'Toyota', 'Elantra', 2021, 'ABC18800', 2, 8);

INSERT INTO jc\_vehicle (vehicle\_vin, vehicle\_make, vehicle\_model, vehicle\_year, license\_plate\_no, loc\_id, vehicle\_id) VALUES ('39787974838173440', 'Hyundai', 'Accord', 2020, 'JKL02400', 3, 7);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (1, TO\_DATE('11/1/2023', 'MM/DD/YYYY'), 286.05, 20);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (2, TO\_DATE('11/1/2023', 'MM/DD/YYYY'), 260.32, 18);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (3, TO\_DATE('11/2/2023', 'MM/DD/YYYY'), 458.65, 19);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (4, TO\_DATE('11/3/2023', 'MM/DD/YYYY'), 364.14, 1);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (5, TO\_DATE('11/5/2023', 'MM/DD/YYYY'), 176.61, 2);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (6, TO\_DATE('11/5/2023', 'MM/DD/YYYY'), 412.26, 17);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (7, TO\_DATE('11/7/2023', 'MM/DD/YYYY'), 424.74, 16);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (8, TO\_DATE('11/7/2023', 'MM/DD/YYYY'), 120.17, 3);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (9, TO\_DATE('11/7/2023', 'MM/DD/YYYY'), 365.60, 4);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (10, TO\_DATE('11/8/2023', 'MM/DD/YYYY'), 401.10, 15);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (11, TO\_DATE('11/9/2023', 'MM/DD/YYYY'), 491.33, 9);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (12, TO\_DATE('11/10/2023', 'MM/DD/YYYY'), 390.93, 5);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (13, TO\_DATE('11/10/2023', 'MM/DD/YYYY'), 486.97, 6);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (14, TO\_DATE('11/10/2023', 'MM/DD/YYYY'), 351.70, 13);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (15, TO\_DATE('11/11/2023', 'MM/DD/YYYY'), 251.70, 14);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (16, TO\_DATE('11/12/2023', 'MM/DD/YYYY'), 428.99, 7);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (17, TO\_DATE('11/13/2023', 'MM/DD/YYYY'), 183.92, 8);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (18, TO\_DATE('11/14/2023', 'MM/DD/YYYY'), 114.53, 12) ;

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (19, TO\_DATE('11/14/2023', 'MM/DD/YYYY'), 362.90, 11);

INSERT INTO jc\_invoice (invoice\_id, invoice\_date, invoice\_amount, service\_id) VALUES (20, TO\_DATE('11/15/2023', 'MM/DD/YYYY'), 172.14, 10);

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (1, 'Visa');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (2, 'Mastercard');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (3, 'American Express');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (4, 'Discover');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (5, 'JCB');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (6, 'Diners Club');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (7, 'Carte Blanche');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (8, 'China UnionPay');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (9, 'Maestro');

INSERT INTO jc\_card\_type (card\_type\_id, type\_name) VALUES (10, 'Electron');

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (1, TO\_DATE('11/1/2023', 'MM/DD/YYYY'), '5592056333172992', 1, 4);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (2, TO\_DATE('11/12/2023', 'MM/DD/YYYY'), '6544036909269729', 2, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (3, TO\_DATE('11/07/2023', 'MM/DD/YYYY'), '5901389979804023', 3, 3);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (4, TO\_DATE('11/12/2023', 'MM/DD/YYYY'), '7101689179311568', 4, 1);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (5, TO\_DATE('11/10/2023', 'MM/DD/YYYY'), '1765842134041871', 5, 2);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (6, TO\_DATE('11/08/2023', 'MM/DD/YYYY'), '6624503305630504', 6, 4);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (7, TO\_DATE('11/09/2023', 'MM/DD/YYYY'), '4722663911676210', 7, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (8, TO\_DATE('11/12/2023', 'MM/DD/YYYY'), '9279689068045021', 8, 3);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (9, TO\_DATE('11/11/2023', 'MM/DD/YYYY'), '4002158299984822', 9, 2);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (10, TO\_DATE('11/13/2023', 'MM/DD/YYYY'), '5769850775546851', 10, 2);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (11, TO\_DATE('11/16/2023', 'MM/DD/YYYY'), '1635375209274466', 11, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (12, TO\_DATE('11/19/2023', 'MM/DD/YYYY'), '7967389041059884', 12, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (13, TO\_DATE('11/20/2023', 'MM/DD/YYYY'), '3252814464085864', 13, 6);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (14, TO\_DATE('11/21/2023', 'MM/DD/YYYY'), '1575499649453264', 14, 4);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (15, TO\_DATE('11/16/2023', 'MM/DD/YYYY'), '8407612688356883', 15, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (16, TO\_DATE('11/18/2023', 'MM/DD/YYYY'), '7483665849065060', 16, 8);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (17, TO\_DATE('11/17/2023', 'MM/DD/YYYY'), '7728705484790868', 17, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (18, TO\_DATE('11/20/2023', 'MM/DD/YYYY'), '9414730357026336', 18, 3);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (19, TO\_DATE('11/16/2023', 'MM/DD/YYYY'), '2495898899739702', 19, 7);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (20, TO\_DATE('11/17/2023', 'MM/DD/YYYY'), '7173884435759535', 20, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (21, TO\_DATE('11/18/2023', 'MM/DD/YYYY'), '9816574641576445', 15, 7);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (22, TO\_DATE('11/19/2023', 'MM/DD/YYYY'), '5378327876357835', 18, 8);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (23, TO\_DATE('11/20/2023', 'MM/DD/YYYY'), '7837453787534873', 19, 5);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (24, TO\_DATE('11/21/2023', 'MM/DD/YYYY'), '7832453787537837', 20, 9);

INSERT INTO jc\_payment (payment\_id, payment\_date, card\_no, invoice\_id, card\_type\_id) VALUES (25, TO\_DATE('11/22/2023', 'MM/DD/YYYY'), '7854563783735743', 20, 5);

# COUNT(\*) Query and Result

SELECT COUNT(\*) AS total\_jc\_discount

FROM jc\_discount;

SELECT COUNT(\*) AS total\_discount\_corp

FROM discount\_corp;

SELECT COUNT(\*) AS total\_discount\_indi

FROM discount\_indi;

SELECT COUNT(\*) AS total\_jc\_service

FROM jc\_service;

SELECT COUNT(\*) AS total\_corporate

FROM corporate;

SELECT COUNT(\*) AS total\_individual

FROM individual;

SELECT COUNT(\*) AS total\_jc\_customer

FROM jc\_customer;

SELECT COUNT(\*) AS total\_jc\_vehicle

FROM jc\_vehicle;

SELECT COUNT(\*) AS total\_jc\_vehicle\_class

FROM jc\_vehicle\_class;

SELECT COUNT(\*) AS total\_jc\_loc

FROM jc\_loc;

SELECT COUNT(\*) AS total\_jc\_invoice

FROM jc\_invoice;

SELECT COUNT(\*) AS total\_jc\_payment

FROM jc\_payment;

SELECT COUNT(\*) AS total\_jc\_card\_type

FROM jc\_card\_type;

文本

描述已自动生成

# Data Dictionary Queries

SELECT table\_name, column\_name, data\_type, data\_length, nullable

FROM user\_tab\_columns;

日历

描述已自动生成

SELECT table\_name, constraint\_name, column\_name

FROM user\_cons\_columns

WHERE constraint\_name IN (SELECT constraint\_name FROM user\_constraints WHERE constraint\_type = 'P');

日历

描述已自动生成

SELECT table\_name, constraint\_name, column\_name

FROM user\_cons\_columns

WHERE constraint\_name IN (SELECT constraint\_name FROM user\_constraints WHERE constraint\_type = 'R');

文本, 日历

中度可信度描述已自动生成

SELECT table\_name, column\_name, comments

FROM user\_col\_comments;

图形用户界面

中度可信度描述已自动生成