Principles of Database Systems
CS-GY 6083 – B, Spring 2022

Project Part 1

Business Case: WOW (World On Wheels)

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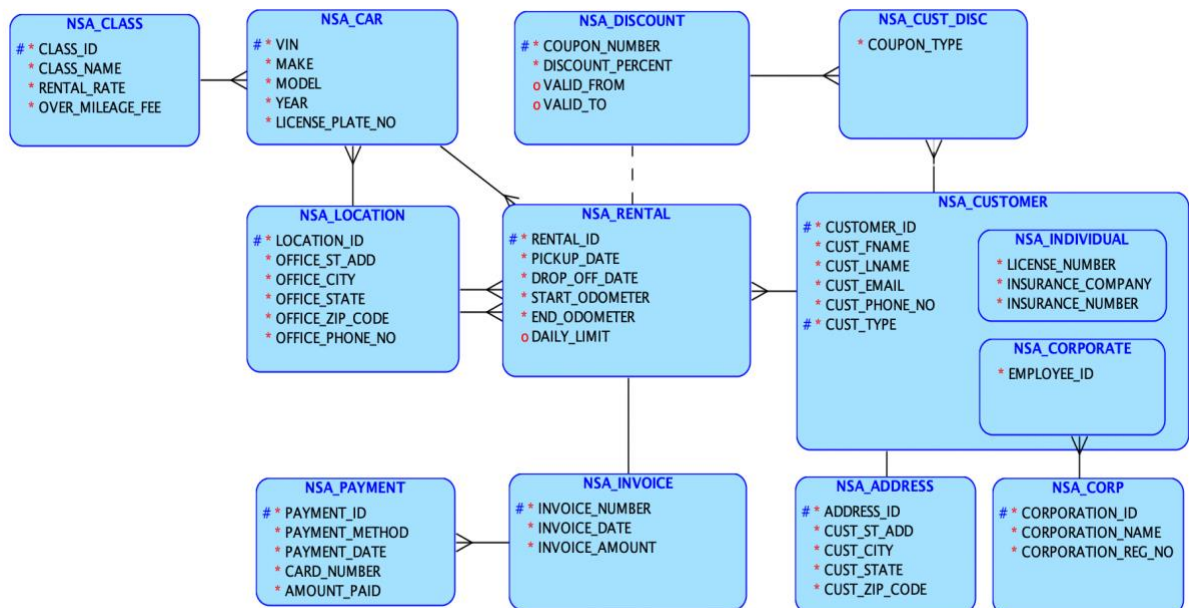
Project Overview:

The given business case: WOW (World On Wheels) is a car rental company. The major aim of this project is to build a database design that satisfies the business constraints or rules. Using the business rules provided, the database design we presented in this project has an entity named- "NSA_RENTAL" where all the rental agreements take place, so it has relationships with other entities of the same business case namely: customer, discount, cars, location, and invoice. The design uses Triggering. Whenever a record is inserted into the NSA_RENTAL table, it calculates the invoice amount internally using the trigger code with the help of other attributes like start_odometer, end_odometer, discount etc.

Assumptions:

- We used our initials, NSA_ as prefixes to all the tables.
- Name and address are composite attributes, so we divided them into multiple simple attributes.
- At a single location there can be multiple classes of cars and a single class car can be at different locations, so many-to-many relation between NSA_LOCATION and NSA_CLASS. It is resolved using an associate entity.
- A car can be rented many times, so there is a one-to-many relationship between NSA_CAR and NSA_RENTAL.
- VIN is the car's vehicle identification number, which is unique for each car, so it is used as a primary key in the NSA_CAR entity.
- In NSA_RENTAL, the pick_up_loc_id and drop_off_loc_id are obtained from location_id, which is the primary key of NSA_LOCATION. Hence, there are two connections between NSA_RENTAL and NSA_RENTAL.
- Given, some rental services are with unlimited mileage, so daily_limit is kept as optional in NSA_RENTAL.
- Customers can be individual or corporate or both, so it has two subtypes which are distinguished by cust_type. Also, cust_type is made as the primary key along with customer_id because the same customer can be both individual and corporate.
- Many corporate employees can be from the same corporation, so a separate NSA_CORP entity is created with corporate_id as primary key.
- There can be some customers who can book more than one car, so there is a one-to-many relationship between NSA_CUSTOMER and NSA_RENTAL.
- Class_id, customer_id, location_id, rental_id, payment_id, address_id, invoice_number, coupon_number are added as primary keys in their respective tables.
- Given, WOW keeps only one address of each customer, so a separate entity NSA_ADDRESS entity is created. There is a one-to-one relationship between NSA_CUSTOMER and NSA_ADDRESS, We made NSA_ADDRESS as a parent.

- Same coupon can be distributed to multiple customers and a customer can have multiple coupons, so a many-to-many relationship between NSA_CUSTOMER and NSA_DISCOUNT. It is resolved by adding an NSA_CUST_DISC intersect entity which has coupon_type attribute.
- Some customers may or may not have a coupon, so it is made optional on one side.
- Since some corporate customers can have coupons with no expiration date, valid_from and valid_to attributes in NSA_DISCOUNT are made optional.
- The relationship between NSA_RENTAL and NSA_DISCOUNT is optional, as the discount may not be applicable to all the rentals.
- A rental service can generate only one invoice, so a one-to-one relationship between NSA_RENTAL and NSA_INVOICE. In the relational model, NSA_RENTAL is made as a parent.
- An invoice amount can be paid using multiple payment methods for a single transaction, such as a gift card applied or using a credit card for the remaining balance, so a one-to-many relationship between NSA_INVOICE and NSA_PAYMENT.
- Further, an optional entity "INSURANCE" can be added if WOW decides to offer insurance to the customer. This can be connected directly to the NSA_INDIVIDUAL entity.

Logical Model of Database Design:

Relational Model of Database Design:

NSA_CLASS

P	* CLASS_ID	NUMBER (6)
	* CLASS_NAME	VARCHAR2 (20)
	* RENTAL_RATE	NUMBER (7,2)
	* OVER_MILEAGE_FEE	NUMBER (7,2)

NSA_CLASS_PK (CLASS_ID)

NSA_CAR

P	* VIN	VARCHAR2 (17)
	* MAKE	VARCHAR2 (30)
	* MODEL	VARCHAR2 (20)
	* YEAR	NUMBER (4)
	* LICENSE_PLATE_NO	VARCHAR2 (10)
F	* LOCATION_ID	NUMBER (6)
F	* CLASS_ID	NUMBER (6)

NSA_CAR_PK (VIN)
NSA_CAR_NSA_CLASS_FK (CLASS_ID)
NSA_CAR_NSA_LOCATION_FK (LOCATION_

NSA_DISCOUNT

P	* COUPON_NUMBER	NUMBER (6)
	* DISCOUNT_PERCENT	NUMBER (2)
	VALID_FROM	DATE
	VALID_TO	DATE

NSA_DISCOUNT_PK (COUPON_NUMBER)

NSA_CUST_DISC

	* COUPON_TYPE	CHAR (1)
F	CUSTOMER_ID	NUMBER (6)
F	CUST_TYPE	CHAR (1)
PF	* COUPON_NUMBER	NUMBER (6)

NSA_CUST_DISC_PK (COUPON_NUMBER)
NSA_CUST_DISC_NSA_DISCOUNT_FK (COUPON_NUMBER)
NSA_CUST_DISC_NSA_CUSTOMER_FK (CUSTOMER_ID, CUST_TYPE)

NSA_INDIVIDUAL

PF	* CUSTOMER_ID	NUMBER (6)
	* LICENSE_NUMBER	VARCHAR2 (12)
	* INSURANCE_COMPANY	VARCHAR2 (30)
	* INSURANCE_NUMBER	NUMBER (7)
PF	* CUST_TYPE	CHAR (1)

NSA_INDIVIDUAL_PK (CUSTOMER_ID, CUST_TYPE)
NSA_INDIVIDUAL_NSA_CUSTOMER_FK (CUSTOMER_ID, CUST_TYPE)

NSA_RENTAL

P	* RENTAL_ID	NUMBER (6)
	* PICKUP_DATE	DATE
	* DROP_OFF_DATE	DATE
	* START_ODOMETER	NUMBER (7,2)
	* END_ODOMETER	NUMBER (7,2)
	DAILY_LIMIT	NUMBER (5)
F	* VIN	VARCHAR2 (17)
F	* PICK_UP_LOC_ID	NUMBER (6)
F	DROP_OFF_LOC_ID	NUMBER (6)
F	* CUSTOMER_ID	NUMBER (6)
F	* CUST_TYPE	CHAR (1)
F	COUPON_NUMBER	NUMBER (6)

NSA_RENTAL_PK (RENTAL_ID)
NSA_RENTAL_NSA_CAR_FK (VIN)
NSA_RENTAL_NSA_CUSTOMER_FK (CUSTOMER_ID, CUST_TYPE)
NSA_RENTAL_NSA_LOCATION_FK (DROP_OFF_LOC_ID)
NSA_RENTAL_NSA_DISCOUNT_FK (COUPON_NUMBER)
NSA_RENTAL_NSA_LOCATION_FKv2 (PICK_UP_LOC_ID)

NSA_CUSTOMER

P	* CUSTOMER_ID	NUMBER (6)
	* CUST_FNAME	VARCHAR2 (20)
	* CUST_LNAME	VARCHAR2 (20)
	* CUST_EMAIL	VARCHAR2 (30)
	* CUST_PHONE_NO	NUMBER (10)
P	* CUST_TYPE	CHAR (1)
F	* ADDRESS_ID	NUMBER (6)

NSA_CUSTOMER_PK (CUSTOMER_ID, CUST_TYPE)
NSA_CUSTOMER_NSA_ADDRESS_FK (ADDRESS_ID)

NSA_CORPORATE

PF	* CUSTOMER_ID	NUMBER (6)
	* EMPLOYEE_ID	VARCHAR2 (10)
F	* CORPORATION_ID	NUMBER (6)
PF	* CUST_TYPE	CHAR (1)

NSA_CORPORATE_PK (CUSTOMER_ID, CUST_TYPE)
NSA_CORPORATE_NSA_CUSTOMER_FK (CUSTOMER_ID, CUST_TYPE)
NSA_CORPORATE_NSA_CORP_FK (CORPORATION_ID)

NSA_LOCATION

P	* LOCATION_ID	NUMBER (6)
	* OFFICE_ST_ADD	VARCHAR2 (30)
	* OFFICE_CITY	VARCHAR2 (30)
	* OFFICE_STATE	VARCHAR2 (2)
	* OFFICE_ZIP_CODE	VARCHAR2 (6)
	* OFFICE_PHONE_NO	NUMBER (10)

NSA_LOCATION_PK (LOCATION_ID)

NSA_PAYMENT

P	* PAYMENT_ID	NUMBER (6)
	* PAYMENT_METHOD	VARCHAR2 (30)
	* PAYMENT_DATE	DATE
	* CARD_NUMBER	NUMBER (16)
	* AMOUNT_PAID	NUMBER (9,2)
F	* INVOICE_NUMBER	VARCHAR2 (15)

NSA_PAYMENT_PK (PAYMENT_ID)
NSA_PAYMENT_NSA_INVOICE_FK (INVOICE_NUMBER)

NSA_INVOICE

P	* INVOICE_NUMBER	VARCHAR2 (15)
	* INVOICE_DATE	DATE
	* INVOICE_AMOUNT	NUMBER (9,2)
F	* RENTAL_ID	NUMBER (6)

NSA_INVOICE_PK (INVOICE_NUMBER)
NSA_INVOICE_NSA_RENTAL_FK (RENTAL_ID)

NSA_ADDRESS

P	* ADDRESS_ID	NUMBER (6)
	* CUST_ST_ADD	VARCHAR2 (30)
	* CUST_CITY	VARCHAR2 (30)
	* CUST_STATE	VARCHAR2 (2)
	* CUST_ZIP_CODE	VARCHAR2 (6)

NSA_ADDRESS_PK (ADDRESS_ID)

NSA_CORP

P	* CORPORATION_ID	NUMBER (6)
	* CORPORATION_NAME	VARCHAR2 (30)
	* CORPORATION_REG_NO	VARCHAR2 (30)

NSA_CORP_PK (CORPORATION_ID)

List of tables:

: List of Tables

TABLE_NAME
NSA_ADDRESS
NSA_CAR
NSA_CLASS
NSA_CORP
NSA_CORPORATE
NSA_CUSTOMER
NSA_CUST_DISC
NSA_DISCOUNT
NSA_INDIVIDUAL
NSA_INVOICE
NSA_LOCATION
NSA_PAYMENT
NSA_RENTAL

Download CSV
13 rows selected.

Record counts of each table:

```
1   select count(*) "nsa_class_records"
2   from nsa_class;
3   select count(*) "nsa_location_records"
4   from nsa_location;
5   select count(*) "nsa_car_records"
6   from nsa_car;
7   select count(*) "nsa_address_records"
8   from nsa_address;
9   select count(*) "nsa_customer_records"
10  from nsa_customer;
11  select count(*) "nsa_individual_records"
12  from nsa_individual;
13  select count(*) "nsa_corporation_records"
14  from nsa_corp;
15  select count(*) "nsa_discount_records"
16  from nsa_discount;
17  select count(*) "nsa_corporate_records"
18  from nsa_corporate;
19  select count(*) "nsa_customer_discount_records"
20  from nsa_cust_disc;
21  select count(*) "nsa_rental_records"
22  from nsa_rental;
23  select count(*) "nsa_invoice_records"
24  from nsa_invoice;
25  select count(*) "nsa_payment_records"
26  from nsa_payment;
```

nsa_class_records
10

Download CSV

nsa_location_records
11

Download CSV

nsa_car_records
12

Download CSV

nsa_address_records
10

Download CSV

nsa_customer_records
12

Download CSV

nsa_individual_records
6

Download CSV

nsa_corporation_records
10

Download CSV

nsa_discount_records
11

Download CSV

nsa_corporate_records
6

Download CSV

nsa_customer_discount_records
10

Download CSV

nsa_rental_records
13

Download CSV

nsa_invoice_records
13

Download CSV

nsa_payment_records
14

Download CSV

DDL code:

```
-- Generated by Oracle SQL Developer Data Modeler 21.4.1.349.1605

--   at:          2022-04-08 09:24:17 EDT

--   site:        Oracle Database 21c

--   type:        Oracle Database 21c

-- predefined type, no DDL - MDSYS.SDO_GEOMETRY

-- predefined type, no DDL - XMLTYPE


CREATE TABLE nsa_address (

      address_id  NUMBER(6) NOT NULL,

      cust_st_add   VARCHAR2(30) NOT NULL,

      cust_city   VARCHAR2(30) NOT NULL,

      cust_state  VARCHAR2(2) NOT NULL,

      cust_zip_code VARCHAR2(6) NOT NULL

);
COMMENT ON COLUMN nsa_address.address_id IS

      'This is the unique address id';

COMMENT ON COLUMN nsa_address.cust_st_add IS

      'This is the street address of the customer';

COMMENT ON COLUMN nsa_address.cust_city IS

      'This is the city in which customer stays';

COMMENT ON COLUMN nsa_address.cust_state IS

      'This is the state in which customer stays';


COMMENT ON COLUMN nsa_address.cust_zip_code IS

      'This is the zip code of the customer';

ALTER TABLE nsa_address ADD CONSTRAINT nsa_address_pk PRIMARY KEY (
address_id );
```

```sql
CREATE TABLE nsa_car (

    vin             VARCHAR2(17) NOT NULL,

    make            VARCHAR2(30) NOT NULL,

    model           VARCHAR2(20) NOT NULL,

    year            NUMBER(4) NOT NULL,

    license_plate_no VARCHAR2(10) NOT NULL,

    location_id     NUMBER(6) NOT NULL,

    class_id        NUMBER(6) NOT NULL
);

COMMENT ON COLUMN nsa_car.vin IS

    'This is a unique vehicle identification number';

COMMENT ON COLUMN nsa_car.make IS

    'This is the company that made that car';

COMMENT ON COLUMN nsa_car.model IS

    'This is the model of the car';

COMMENT ON COLUMN nsa_car.year IS

    'This is the year in which car is manufactured';

COMMENT ON COLUMN nsa_car.license_plate_no IS

    'This the license plate number of the car';

ALTER TABLE nsa_car ADD CONSTRAINT nsa_car_pk PRIMARY KEY ( vin );


CREATE TABLE nsa_class (

    class_id        NUMBER(6) NOT NULL,

    class_name      VARCHAR2(20) NOT NULL,

    rental_rate     NUMBER(7, 2) NOT NULL,

    over_mileage_fee NUMBER(7, 2) NOT NULL
);

COMMENT ON COLUMN nsa_class.class_id IS
```

'This is the class Id of the car';

COMMENT ON COLUMN nsa_class.class_name IS

     'This is the name of the car class';

COMMENT ON COLUMN nsa_class.rental_rate IS

     'This is the rental rate per day of the car class';

COMMENT ON COLUMN nsa_class.over_mileage_fee IS

     'This is the ocer mileage fee for that car class';

ALTER TABLE nsa_class ADD CONSTRAINT nsa_class_pk PRIMARY KEY (class_id
);

CREATE TABLE nsa_corp (

     corporation_id   NUMBER(6) NOT NULL,

     corporation_name   VARCHAR2(30) NOT NULL,

     corporation_reg_no VARCHAR2(30) NOT NULL

);

COMMENT ON COLUMN nsa_corp.corporation_id IS

     'This is the unique corporation ID';

COMMENT ON COLUMN nsa_corp.corporation_name IS

     'This is the name of the corporation';

COMMENT ON COLUMN nsa_corp.corporation_reg_no IS

     'This is the registration number of the corporation';

ALTER TABLE nsa_corp ADD CONSTRAINT nsa_corp_pk PRIMARY KEY (
corporation_id);

CREATE TABLE nsa_corporate (

     customer_id NUMBER(6) NOT NULL,

     employee_id VARCHAR2(10) NOT NULL,

     corporation_id NUMBER(6) NOT NULL,

     cust_type   CHAR(1) NOT NULL

);

```sql
COMMENT ON COLUMN nsa_corporate.customer_id IS

      'This is the unique customer ID';

COMMENT ON COLUMN nsa_corporate.employee_id IS

      'This is the unique employee ID';

COMMENT ON COLUMN nsa_corporate.cust_type IS

      'This is the customer type discriminator';

ALTER TABLE nsa_corporate ADD CONSTRAINT nsa_corporate_pk PRIMARY KEY (
customer_id,
cust_type );

CREATE TABLE nsa_cust_disc (

      coupon_type   CHAR(1) NOT NULL,

      customer_id   NUMBER(6),

      cust_type   CHAR(1),

      coupon_number NUMBER(6) NOT NULL

);

COMMENT ON COLUMN nsa_cust_disc.coupon_type IS

      'This is the type of the coupon customer has.';



ALTER TABLE nsa_cust_disc ADD CONSTRAINT nsa_cust_disc_pk PRIMARY KEY (
coupon_number );

CREATE TABLE nsa_customer (

      customer_id   NUMBER(6) NOT NULL,

      cust_fname   VARCHAR2(20) NOT NULL,

      cust_lname   VARCHAR2(20) NOT NULL,

      cust_email   VARCHAR2(30) NOT NULL,

      cust_phone_no NUMBER(10) NOT NULL,

      cust_type   CHAR(1) NOT NULL,

      address_id   NUMBER(6) NOT NULL

);
```

```sql
ALTER TABLE nsa_customer

    ADD CONSTRAINT ch_inh_nsa_customer CHECK ( cust_type IN ( 'C', 'I'
) );

COMMENT ON COLUMN nsa_customer.customer_id IS

    'This is the unique customer ID';

COMMENT ON COLUMN nsa_customer.cust_fname IS

    'This is the first name of the customer';

COMMENT ON COLUMN nsa_customer.cust_lname IS

    'This is the last name of the customer';

COMMENT ON COLUMN nsa_customer.cust_email IS

    'This is the email id of the customer';

COMMENT ON COLUMN nsa_customer.cust_phone_no IS

    'This is the phone number of the customer';


COMMENT ON COLUMN nsa_customer.cust_type IS

    'This is the customer type discriminator';

ALTER TABLE nsa_customer ADD CONSTRAINT nsa_customer_pk PRIMARY KEY (
customer_id,
cust_type );

CREATE TABLE nsa_discount (

    coupon_number     NUMBER(6) NOT NULL,

    discount_percent NUMBER(2) NOT NULL,

    valid_from        DATE,

    valid_to          DATE

);

COMMENT ON COLUMN nsa_discount.coupon_number IS

    'This is the unique coupon number';

COMMENT ON COLUMN nsa_discount.discount_percent IS

    'This is Percentage of the discount offered.';
```

```sql
COMMENT ON COLUMN nsa_discount.valid_from IS

        'This is the data the coupon is valid from';

COMMENT ON COLUMN nsa_discount.valid_to IS

        'This is the data the coupon is valid to.';

ALTER TABLE nsa_discount ADD CONSTRAINT nsa_discount_pk PRIMARY KEY (
coupon_number );

CREATE TABLE nsa_individual (

        customer_id        NUMBER(6) NOT NULL,

        license_number     VARCHAR2(12) NOT NULL,

        insurance_company VARCHAR2(30) NOT NULL,

        insurance_number  NUMBER(7) NOT NULL,

        cust_type         CHAR(1) NOT NULL);

COMMENT ON COLUMN nsa_individual.customer_id IS

        'This is the unique customer ID';

COMMENT ON COLUMN nsa_individual.license_number IS

        'This is the license number of the individual customer';

COMMENT ON COLUMN nsa_individual.insurance_company IS

        'This is the name of the insurance company';

COMMENT ON COLUMN nsa_individual.insurance_number IS

        'This is the insurance number of the individual customer.';

COMMENT ON COLUMN nsa_individual.cust_type IS

        'This is the customer type discriminator';

ALTER TABLE nsa_individual ADD CONSTRAINT nsa_individual_pk PRIMARY KEY (
customer_id,
cust_type );

CREATE TABLE nsa_invoice (

        invoice_number VARCHAR2(15) NOT NULL,

        invoice_date   DATE NOT NULL,

        invoice_amount NUMBER(9, 2) NOT NULL,
```

```
      rental_id   NUMBER(6) NOT NULL

);

COMMENT ON COLUMN nsa_invoice.invoice_number IS

      'This is the Invoice number';

COMMENT ON COLUMN nsa_invoice.invoice_date IS

      'This is date on which invoice is generated';

COMMENT ON COLUMN nsa_invoice.invoice_amount IS

      'This is amount the customer should pay.';


ALTER TABLE nsa_invoice ADD CONSTRAINT nsa_invoice_pk PRIMARY KEY (
invoice_number );

CREATE TABLE nsa_location (

      location_id      NUMBER(6) NOT NULL,

      office_st_add    VARCHAR2(30) NOT NULL,

      office_city      VARCHAR2(30) NOT NULL,

      office_state     VARCHAR2(2) NOT NULL,

      office_zip_code VARCHAR2(6) NOT NULL,

      office_phone_no NUMBER(10) NOT NULL

);

COMMENT ON COLUMN nsa_location.location_id IS

      'This is the unique location ID';

COMMENT ON COLUMN nsa_location.office_st_add IS

      'This is the street address of the office.';

COMMENT ON COLUMN nsa_location.office_city IS

      'This is the city in which office is loacted';

COMMENT ON COLUMN nsa_location.office_state IS

      'This is the state in which office is located';

COMMENT ON COLUMN nsa_location.office_zip_code IS
```

```sql
        'This is the Zip code of the office location.';

COMMENT ON COLUMN nsa_location.office_phone_no IS

        'This is the phone number of the office';

ALTER TABLE nsa_location ADD CONSTRAINT nsa_location_pk PRIMARY KEY (
location_id );

CREATE TABLE nsa_payment (

        payment_id  NUMBER(6) NOT NULL,

        payment_method VARCHAR2(30) NOT NULL,

        payment_date   DATE NOT NULL,

        card_number NUMBER(16) NOT NULL,

        amount_paid NUMBER(9, 2) NOT NULL,

        invoice_number VARCHAR2(15) NOT NULL

);

COMMENT ON COLUMN nsa_payment.payment_id IS

        'This is the unique payment ID';

COMMENT ON COLUMN nsa_payment.payment_method IS

        'This is the method of the payment';

COMMENT ON COLUMN nsa_payment.payment_date IS

        'This is the data on which payment is made';

COMMENT ON COLUMN nsa_payment.card_number IS

        'This the card number used for the payment';

COMMENT ON COLUMN nsa_payment.amount_paid IS

        'This is the amount for which payment is made';

ALTER TABLE nsa_payment ADD CONSTRAINT nsa_payment_pk PRIMARY KEY (
payment_id );

CREATE TABLE nsa_rental (

        rental_id        NUMBER(6) NOT NULL,

        pickup_date      DATE NOT NULL,

        drop_off_date    DATE NOT NULL,
```

```
        start_odometer  NUMBER(7, 2) NOT NULL,

        end_odometer       NUMBER(7, 2) NOT NULL,

        daily_limit       NUMBER(5),

        vin                VARCHAR2(17) NOT NULL,

        pick_up_loc_id  NUMBER(6) NOT NULL,

        drop_off_loc_id NUMBER(6) NOT NULL,

        customer_id       NUMBER(6) NOT NULL,

        cust_type         CHAR(1) NOT NULL,

        coupon_number    NUMBER(6)
);

COMMENT ON COLUMN nsa_rental.rental_id IS

        'This is the unique rental service id';

COMMENT ON COLUMN nsa_rental.pickup_date IS

        'This is the pick up date of the vehicle';

COMMENT ON COLUMN nsa_rental.drop_off_date IS

        'This is the drop off date of the vehicle';

COMMENT ON COLUMN nsa_rental.start_odometer IS

        'This is the odometer reading at the pick up time';

COMMENT ON COLUMN nsa_rental.end_odometer IS

        'This is the drop off time odometer reading';

COMMENT ON COLUMN nsa_rental.daily_limit IS

        'This is the daily odometer limit of the vehicle';

ALTER TABLE nsa_rental ADD CONSTRAINT nsa_rental_pk PRIMARY KEY (
rental_id );

ALTER TABLE nsa_car

        ADD CONSTRAINT nsa_car_nsa_class_fk FOREIGN KEY ( class_id )

          REFERENCES nsa_class ( class_id );

ALTER TABLE nsa_car
```

```
        ADD CONSTRAINT nsa_car_nsa_location_fk FOREIGN KEY ( location_id )

        REFERENCES nsa_location ( location_id );

ALTER TABLE nsa_corporate

        ADD CONSTRAINT nsa_corporate_nsa_corp_fk FOREIGN KEY (
corporation_id )

        REFERENCES nsa_corp ( corporation_id );

ALTER TABLE nsa_corporate

        ADD CONSTRAINT nsa_corporate_nsa_customer_fk FOREIGN KEY (
customer_id,

                                                        cust_type
)

        REFERENCES nsa_customer ( customer_id,

                                cust_type );

ALTER TABLE nsa_cust_disc

        ADD CONSTRAINT nsa_cust_disc_nsa_customer_fk FOREIGN KEY (
customer_id,

                                                        cust_type
)

        REFERENCES nsa_customer ( customer_id,

                                cust_type );

ALTER TABLE nsa_cust_disc

        ADD CONSTRAINT nsa_cust_disc_nsa_discount_fk FOREIGN KEY (
coupon_number )

        REFERENCES nsa_discount ( coupon_number );

ALTER TABLE nsa_customer

        ADD CONSTRAINT nsa_customer_nsa_address_fk FOREIGN KEY ( address_id
)

        REFERENCES nsa_address ( address_id );

ALTER TABLE nsa_individual

        ADD CONSTRAINT nsa_individual_nsa_customer_fk FOREIGN KEY (
customer_id,
```

```
                                                            cust_type
    )

        REFERENCES nsa_customer ( customer_id,

                                  cust_type );

ALTER TABLE nsa_invoice

        ADD CONSTRAINT nsa_invoice_nsa_rental_fk FOREIGN KEY ( rental_id )

        REFERENCES nsa_rental ( rental_id );

ALTER TABLE nsa_payment

        ADD CONSTRAINT nsa_payment_nsa_invoice_fk FOREIGN KEY (
invoice_number )

        REFERENCES nsa_invoice ( invoice_number );

ALTER TABLE nsa_rental

        ADD CONSTRAINT nsa_rental_nsa_car_fk FOREIGN KEY ( vin )

        REFERENCES nsa_car ( vin );

ALTER TABLE nsa_rental

        ADD CONSTRAINT nsa_rental_nsa_customer_fk FOREIGN KEY (
customer_id,

                                                cust_type )

        REFERENCES nsa_customer ( customer_id,

                                  cust_type );

ALTER TABLE nsa_rental

        ADD CONSTRAINT nsa_rental_nsa_discount_fk FOREIGN KEY (
coupon_number )

        REFERENCES nsa_discount ( coupon_number );


ALTER TABLE nsa_rental

        ADD CONSTRAINT nsa_rental_nsa_location_fk FOREIGN KEY (
drop_off_loc_id )

        REFERENCES nsa_location ( location_id );

ALTER TABLE nsa_rental
```

```
        ADD CONSTRAINT nsa_rental_nsa_location_fkv2 FOREIGN KEY (
pick_up_loc_id )

        REFERENCES nsa_location ( location_id );

CREATE OR REPLACE TRIGGER arc_fkarc_3_nsa_corporate BEFORE

        INSERT OR UPDATE OF customer_id, cust_type ON nsa_corporate

        FOR EACH ROW

DECLARE

        d CHAR(1);

BEGIN

        SELECT

        a.cust_type

        INTO d

        FROM

        nsa_customer a

        WHERE

        a.customer_id = :new.customer_id

        AND a.cust_type = :new.cust_type;

        IF ( d IS NULL OR d <> 'C' ) THEN

        raise_application_error(-20223,

                            'FK NSA_CORPORATE_NSA_CUSTOMER_FK in Table
NSA_CORPORATE violates Arc constraint on Table NSA_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_3_nsa_individual BEFORE

      INSERT OR UPDATE OF customer_id, cust_type ON nsa_individual

      FOR EACH ROW

DECLARE

      d CHAR(1);

BEGIN

      SELECT

      a.cust_type

      INTO d

      FROM

      nsa_customer a

      WHERE

      a.customer_id = :new.customer_id

      AND a.cust_type = :new.cust_type;

      IF ( d IS NULL OR d <> 'I' ) THEN

      raise_application_error(

                              -20223,

                              'FK NSA_INDIVIDUAL_NSA_CUSTOMER_FK in Table
NSA_INDIVIDUAL violates Arc constraint on Table NSA_CUSTOMER -
discriminator column CUST_TYPE does not have value ''I'''

      );

      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   0

-- ALTER TABLE   29

-- CREATE VIEW   0

-- ALTER VIEW   0

-- CREATE PACKAGE   0

-- CREATE PACKAGE BODY   0

-- CREATE PROCEDURE   0

-- CREATE FUNCTION   0

-- CREATE TRIGGER   2

-- 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
```

Check Constraints:

```sql
1  ALTER TABLE nsa_class ADD CONSTRAINT c_rental_rate CHECK (rental_rate >= 0);
2  ALTER TABLE nsa_class ADD CONSTRAINT c_over_mileage_fee CHECK (over_mileage_fee >= 0);
3  ALTER TABLE nsa_invoice ADD CONSTRAINT c_invoice_amount CHECK (invoice_amount >= 0);
4  ALTER TABLE nsa_rental ADD CONSTRAINT c_drop_off_date CHECK ((drop_off_date - pickup_date) >= 0);
5  ALTER TABLE nsa_rental ADD CONSTRAINT c_end_odometer CHECK ((end_odometer - start_odometer) >= 0);
6  ALTER TABLE nsa_discount ADD CONSTRAINT c_end_date CHECK ((valid_to -valid_from) >= 0);
```

DML code:

NSA_CLASS:

```sql
1   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100000, 'Luxury car', 90, 5 );
2   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100001, 'Mini van', 40, 3);
3   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100002, 'Premium SUV', 70, 4  );
4   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100003, 'SUV', 60, 3  );
5   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100004, 'Station Wagon', 50, 3);
6   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100005, 'Mid-size car', 40, 2);
7   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100006, 'Small-size car', 30, 2);
8   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100007, 'Sports car', 120, 9);
9   INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100008, 'Convertible', 80, 7);
10  INSERT INTO nsa_class(class_id, class_name, rental_rate, over_mileage_fee) VALUES ( 100009, 'Pickup truck', 60, 4);
```

NSA_LOCATION:

```
1   INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
2   VALUES ( 300001, 'Prince street','Dallas', 'TX', '11206', 6464341223);
3   INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
4   VALUES ( 300002, 'Adams street', 'Chicago', 'IL', '11304', 5167393043);
5   INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
6   VALUES ( 300003, 'Bleeker street','Columbus', 'OH', '12103', 9377094947);
7   INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
8   VALUES ( 300004, 'Canal street','Los Angeles', 'CA', '11209', 6074351887);
9   INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
10  VALUES ( 300005, 'Queens street','Arlington', 'TX', '11344', 7175428097);
11  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
12  VALUES ( 300006, 'Cortland street', 'New York', 'NY', '11299', 8086584990);
13  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
14  VALUES ( 300007, 'Bluemont street','Tempe', 'FL', '13302', 9083780296);
15  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state,  office_zip_code, office_phone_no)
16  VALUES ( 300008, '8th street','Jersey City', 'NJ', '11442', 2693298325);
17  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
18  VALUES ( 300009, 'DeLance street','Buffalo', 'NY', '11208', 9415862133);
19  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
20  VALUES ( 300010, 'Court street','Edison', 'NJ', '11229', 5122400625 );
21  INSERT INTO nsa_location (location_Id, office_st_add, office_city, office_state, office_zip_code, office_phone_no)
22  VALUES ( 300011, '68th street','Bay Ridge', 'NY', '11220', 9553800159 );
```

NSA_CAR:

```
1   INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
2   VALUES ( '2FMDK3JC6ABB50129', 'Ford', 'Edge', 2010, 'NJ2601', 300001, 100002 );
3   INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
4   VALUES ( 'WDBAB23A6DB369209', ' Mercedes Benz', '240 Class', 1983, 'CA1676', 300002, 100001);
5   INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
6   VALUES ( '2CNBJ1365W6902635', 'Chevrolet', 'Tracker', 1998, 'OH2108', 300003, 100000);
7   INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
8   VALUES ( '2T1BR18E5WC056406', 'Toyota', 'Corolla', 1998, 'NJ4127', 300004, 100009);
9   INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
10  VALUES ( '2HKRM4H73CH623544', 'Honda ', 'Cr V ', 2012, 'PN8142', 300005, 100008);
11  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
12  VALUES ( 'YV1AH852071023377', 'Volvo', 'S80', 2007, 'IL1231', 300006, 100007);
13  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
14  VALUES ( '5FNRL38918B111818', 'Tesla', 'Model S', 2017, 'NY4602', 300007, 100006);
15  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
16  VALUES ( '4Y1SL65848Z411439', 'McLaren', '720S', 2014, 'AZ5618', 300008, 100005);
17  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
18  VALUES ( 'JT4B2EEN1K0102237', 'Toyota', 'Highlander', 2021, 'TX9084', 300009, 100004);
19  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
20  VALUES ( 'KNJLT06H2T6196801', 'Ford', 'Aspire', 1996, 'NY1408', 300010, 100003);
21  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
22  VALUES ( '2HGED6349LH506746', 'Honda', 'Civic', 1990, 'WA1234', 300011, 100002);
23  INSERT INTO nsa_car (vin, make, model, year, license_plate_no, location_id, class_id)
24  VALUES ( 'WAULF78K89N032914', 'Audi', 'A4', 2009, 'NY1408', 300001, 100001);
```

NSA_ADDRESS:

```
 1  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
 2  VALUES( 900001, '470 72nd', 'Brooklyn', 'NY', '11209');
 3  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
 4  VALUES( 900002, '532 72nd', 'Queens', 'NY', '11212');
 5  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
 6  VALUES( 900003, '7122 54th', 'Dallas', 'TX', '11209');
 7  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
 8  VALUES( 900004, '503 71st', 'Chicago', 'IL', '11209');
 9  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
10  VALUES( 900005, '343 61st', 'Tempe', 'FL', '11209');
11  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
12  VALUES( 900006, '512 34th', 'Columbus', 'OH', '11209');
13  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
14  VALUES( 900007, '32 Journalsquare', 'Jersey city', 'NJ', '11209');
15  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
16  VALUES( 900008, '370 Jay street', 'Brooklyn', 'NY', '11201');
17  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
18  VALUES( 900009, '470 125th', 'Manhattan', 'NY', '11232');
19  INSERT INTO nsa_address(address_id, cust_st_add, cust_city, cust_state, cust_zip_code)
20  VALUES( 900010, '85th', 'Brooklyn', 'NY', '11209');
```

NSA_CORP:

```
 1  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700001, 'Alpha', 'A3243');
 2  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700002, 'Beta', 'B6743');
 3  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700003, 'Gamma', 'G8909');
 4  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700004, 'Delta', 'D4532');
 5  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700005, 'Omega', 'O9089');
 6  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700006, 'Kappa', 'K8653');
 7  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700007, 'Sigma', 'S0689');
 8  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700008, 'Mu', 'M3149');
 9  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700009, 'Pi', 'P2490');
10  INSERT INTO nsa_corp(corporation_id, corporation_name, corporation_reg_no) VALUES (700010, 'Lambda', 'L9418');
```

NSA_CUSTOMER:

```
 1  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
 2  VALUES (800001, 'Alan', 'Hentrich', 'al456@gmail.com', 6462671008, 'C', 900001);
 3  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
 4  VALUES (800002, 'Anika', 'shinde', 'as123@gmail.com', 6462665456, 'I', 900002);
 5  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
 6  VALUES (800003, 'Aishwarya', 'Henry', 'ah786@gmail.com', 6462645678, 'C', 900003);
 7  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
 8  VALUES (800004, 'Jihan', 'Gupta', 'jg989@gmail.com', 6462443232, 'I', 900004);
 9  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
10  VALUES (800005, 'Sachin', 'Sharma', 'ss665@gmail.com', 6461332424, 'I', 900005);
11  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
12  VALUES (800006, 'Shreya', 'Singh', 'ss912@gmail.com', 6461221008, 'C', 900006);
13  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
14  VALUES (800007, 'Tommy', 'Martinez', 'tm456@gmail.com', 6462677003, 'I', 900007);
15  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
16  VALUES (800008, 'Michael', 'Bravo', 'bravo6@gmail.com', 6462654321, 'C', 900008);
17  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
18  VALUES (800009, 'Momoe', 'Nomoto', 'momoen6@gmail.com', 6462899009, 'I', 900009);
19  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
20  VALUES (800010, 'Yujun', 'Lu', 'yl56@gmail.com', 6461231008, 'C', 900010);
21  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
22  VALUES (800011, 'Sachin', 'Tendulkar', 'st10@gmail.com', 6461987674, 'I', 900006);
23  INSERT INTO nsa_customer (customer_id, cust_fname, cust_lname, cust_email, cust_phone_no, cust_type, address_id)
24  VALUES (800012, 'Rohit', 'Sharma', 'rs45@gmail.com', 6461234567, 'C', 900007);
```

NSA_INDIVIDUAL:

```sql
1   INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
2   VALUES ( 800011,'BIRO1689462', 'Tin Leg', 2568379, 'I');
3   INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
4   VALUES ( 800002, 'BUGD16894486', 'GoReady', 1268379, 'I');
5   INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
6   VALUES ( 800007, 'YOVRO1689142', 'GoReady', 2576379, 'I');
7   INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
8   VALUES ( 800004, 'MORO16894239', 'Nationwide', 4548371, 'I');
9   INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
10  VALUES ( 800009,'BRRZ12345678', 'Seven Corners', 2568987, 'I');
11  INSERT INTO nsa_individual( customer_id, license_number, insurance_company, insurance_number, cust_type)
12  VALUES ( 800005,'BIRO1564354', 'GoReady', 9878379, 'I');
```

NSA_CORPORATE:

```sql
1   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800001, 'E10001', 700001, 'C');
2   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800003, 'E10002', 700008, 'C');
3   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800006, 'E10003', 700007, 'C');
4   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800008, 'E10004', 700002, 'C');
5   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800012, 'E10005', 700006, 'C');
6   INSERT INTO nsa_corporate (customer_id, employee_id, corporation_id, cust_type) VALUES (800010, 'E10006', 700006, 'C');
```

NSA_DISCOUNT:

```sql
1   INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
2   VALUES (600001, 11, null, null);
3   INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
4   VALUES (600002, 22, to_date(' 02-02-2022 ','dd-mm-yyyy'),to_date(' 03-02-2022','dd-mm-yyyy'));
5   INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
6   VALUES (600003, 13, to_date(' 26-02-2022 ','dd-mm-yyyy'),to_date(' 27-02-2022','dd-mm-yyyy'));
7   INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
8   VALUES (600004, 04, null, null);
9   INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
10  VALUES (600005, 15, to_date(' 23-01-2022 ','dd-mm-yyyy'),to_date(' 23-02-2022','dd-mm-yyyy'));
11  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
12  VALUES (600006, 06, to_date(' 26-03-2022 ','dd-mm-yyyy'),to_date(' 27-03-2022','dd-mm-yyyy'));
13  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
14  VALUES (600007, 20, null, null);
15  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
16  VALUES (600008, 25, to_date(' 25-03-2022 ','dd-mm-yyyy'),to_date(' 27-04-2022','dd-mm-yyyy'));
17  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
18  VALUES (600009, 09, null, null);
19  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
20  VALUES (600010, 10, null, null);
21  INSERT INTO nsa_discount (coupon_number, discount_percent, valid_from, valid_to)
22  VALUES (600000, 00, null, null);
```

NSA_CUST_DISC:

```sql
1   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('C', 800001, 'C', 600001);
2   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('I', 800002, 'I', 600005);
3   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('C', 800003, 'C', 600004);
4   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('I', 800004, 'I', 600003);
5   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('I', 800005, 'I', 600002);
6   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('C', 800008, 'C', 600009);
7   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('I', 800009, 'I', 600008);
8   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('C', 800010, 'C', 600007);
9   INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('I', 800011, 'I', 600006);
10  INSERT INTO nsa_cust_disc (coupon_type, customer_id, cust_type, coupon_number) VALUES ('C', 800012, 'C', 600010);
```

NSA_RENTAL:

```
1  INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
2  VALUES (500001 ,to_date('26-01-2022','dd-mm-yyyy'),to_date(' 27-01-2022','dd-mm-yyyy'), 563.5, 763.5, null, '2FMDK3JC6ABB50129', 300002, 300006, 800002, 'I', 600005);
3  INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
4  VALUES (500002 ,to_date('02-02-2022','dd-mm-yyyy'),to_date(' 03-02-2022','dd-mm-yyyy'), 230, 580, 800, 'WDBAB23A6DB369209', 300001, 300004, 800001, 'C', 600001);
5  INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
6  VALUES (500003 ,to_date('26-02-2022','dd-mm-yyyy'),to_date(' 27-02-2022','dd-mm-yyyy'), 125, 632, 900, '2CNBJ1365W6902635', 300003, 300002, 800004, 'I', 600002);
7  INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
8  VALUES (500004 ,to_date('24-01-2022','dd-mm-yyyy'),to_date(' 25-01-2022','dd-mm-yyyy'), 550.5, 890.5, 200, '2T1BR18E5WC056406', 300001, 300006, 800006, 'C', 600007);
9  INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
10 VALUES (500005 ,to_date('12-03-2022','dd-mm-yyyy'),to_date(' 13-03-2022','dd-mm-yyyy'), 530.5, 790.5, null, '2HKRM4H73CH623544', 300005, 300008, 800003, 'C', NULL);
11 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
12 VALUES (500006 ,to_date('26-03-2022','dd-mm-yyyy'),to_date(' 27-03-2022','dd-mm-yyyy'), 385.5, 765.5, 100, 'YV1AH852071023377', 300004, 300002, 800005,'I', 600008);
13 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
14 VALUES (500007 ,to_date('06-01-2022','dd-mm-yyyy'),to_date(' 07-01-2022','dd-mm-yyyy'), 250.5, 950.5, 200, '5FNRL38918B111818', 300003, 300006, 800007,'I', 600006);
15 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
16 VALUES (500008 ,to_date('16-01-2022','dd-mm-yyyy'),to_date(' 17-01-2022','dd-mm-yyyy'), 450.5, 1050.5, 1000, '4Y1SL65848Z411439', 300005, 300001, 800010, 'C', 600001);
17 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
18 VALUES (500009 ,to_date('08-02-2022','dd-mm-yyyy'),to_date(' 09-02-2022','dd-mm-yyyy'), 520.5, 980.5, null, 'JT4B2EEN1K0102237',300002, 300005, 800012,'C', null);
19 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
20 VALUES (500010 ,to_date('26-01-2022','dd-mm-yyyy'),to_date(' 27-01-2022','dd-mm-yyyy'), 50.5, 950.5, 1000, 'WDBAB23A6DB369209', 300005, 300001, 800010, 'C', 600001);
21 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
22 VALUES (500011 ,to_date('08-06-2022','dd-mm-yyyy'),to_date(' 09-06-2022','dd-mm-yyyy'), 20.5, 80.5, null, '2FMDK3JC6ABB50129',300002, 300002, 800012,'C', null);
23 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
24 VALUES (500012 ,to_date('16-04-2022','dd-mm-yyyy'),to_date(' 17-05-2022','dd-mm-yyyy'), 50.5, 950.5, 1000, '4Y1SL65848Z411439', 300005, 300001, 800010, 'C', 600004);
25 INSERT INTO nsa_rental(rental_id,pickup_date,drop_off_date,start_odometer,end_odometer, daily_limit, vin, pick_up_loc_id,drop_off_loc_id, customer_id, cust_type, coupon_number)
26 VALUES (500013 ,to_date('16-04-2022','dd-mm-yyyy'),to_date(' 17-05-2022','dd-mm-yyyy'), 50.5, 250.5, 50, '2HKRM4H73CH623544', 300002, 300002, 800002, 'I', 600005);
```

NSA_INVOICE:

Records in this table are generated using a trigger code when a record is entered in the rental table. Our generated invoice data is show in below data

INVOICE_NUMBER	INVOICE_DATE	INVOICE_AMOUNT	RENTAL_ID
ZXZUQXUJUUVLOOD	27-JAN-22	119	500001
ZRBTUMLPDUDMRHB	03-FEB-22	71.2	500002
IGLECPYEWLGQBBO	27-FEB-22	180	500003
DJBTQRRWPBUALLX	25-JAN-22	96	500004
ZDQGYXBMSZLXRVV	13-MAR-22	160	500005
AOZEOTDJDRKAMQO	27-MAR-22	1395	500006
NXHMSFODNHCUZLL	07-JAN-22	660	500007
NSKOGIUPUBQNRSO	17-JAN-22	71.2	500008
MPJAMDCGYJIRTEA	09-FEB-22	100	500009
EQBOFRJGFJPOVDK	27-JAN-22	71.2	500010
TASXHOXCSJWABIL	09-JUN-22	140	500011
JYGWQWFAYUVEYVP	17-MAY-22	1228.8	500012
NWHQHPFRHSONCQN	17-MAY-22	2560	500013

Download CSV
13 rows selected.

NSA_PAYMENT:

```
1   INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
2   VALUES (400001, 'credit', to_date ( '27-03-2022' , 'dd-mm-yyyy' ), 5684236810354896, 388.40, 'ZXZUQXUJUUVLOOD');
3   INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
4   VALUES (400003, 'debit', to_date ( '21-02-2022' , 'dd-mm-yyyy' ), 7895641236845963, 90, 'ZDQGYXBMSZLXRVV');
5   INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
6   VALUES (400004, 'gift card', to_date ( '27-01-2022' , 'dd-mm-yyyy' ), 8953214652321457, 330, 'IGLECPYEWLGQBBO');
7   INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
8   VALUES (400005, 'credit', to_date ( '12-03-2022' , 'dd-mm-yyyy' ), 4236102514789632, 120, 'AOZEOTDJDRKAMQO');
9   INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
10  VALUES (400006, 'gift card', to_date ( '04-01-2022' , 'dd-mm-yyyy' ), 4896568423681035, 600, 'DJBTQRRWPBUALLX');
11  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
12  VALUES (400007, 'credit', to_date ( '01-03-2022' , 'dd-mm-yyyy' ), 2368568410354896, 126.85, 'NXHMSFODNHCUZLL');
13  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
14  VALUES (400008, 'devit', to_date ( '03-01-2022' , 'dd-mm-yyyy' ), 5681035423684896, 85, 'ZRBTUMLPDUDMRHB');
15  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
16  VALUES (400009, 'debit', to_date ( '04-02-2022' , 'dd-mm-yyyy' ), 1035568423684896, 90, 'MPJAMDCGYJIRTEA');
17  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
18  VALUES (400010, 'credit', to_date ( '20-03-2022' , 'dd-mm-yyyy' ), 5103568423684896, 300, 'NSKOGIUPUBQNRSO');
19  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
20  VALUES (400011, 'debit', to_date ( '04-02-2022' , 'dd-mm-yyyy' ), 9420068423684896, 77.57, 'EQBOFRJGFJPOVDK');
21  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
22  VALUES (400012, 'gift card', to_date ( '04-02-2022' , 'dd-mm-yyyy' ), 9420068423684567, 27.57, 'EQBOFRJGFJPOVDK');
23  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
24  VALUES (400013, 'credit', to_date ( '20-03-2022' , 'dd-mm-yyyy' ), 9687568423684896, 268, 'TASXHOXCSJWABIL');
25  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
26  VALUES (400014, 'debit', to_date ( '04-02-2022' , 'dd-mm-yyyy' ), 1035599923684123, 236, 'JYGWQWFAYUVEYVP');
27  INSERT INTO nsa_payment(payment_id, payment_method, payment_date, card_number, amount_paid, invoice_number)
28  VALUES (400015, 'credit', to_date ( '20-03-2022' , 'dd-mm-yyyy' ), 1234568423684800, 310, 'NWHQHPFRHSONCQN');
```

Database Trigger Code that we used for generating Invoice:

```
1   CREATE OR REPLACE TRIGGER NSA_RENTAL_INVOICE
2   AFTER INSERT ON NSA_RENTAL
3   DECLARE
4    numdays NUMBER(7,0);
5    distance NUMBER(7,2);
6    totcost NUMBER(7,2);
7    overmilfee NUMBER(7,2);
8    invdate DATE;
9    invnum VARCHAR(15);
10   rentalid NUMBER(6,0);
11   coupnum NUMBER(6,0);
12   defcoupnum NUMBER(6,0);
13  BEGIN
14   select max(rental_id) into rentalid from nsa_rental;
15   select min(COUPON_NUMBER) into defcoupnum from NSA_DISCOUNT;
16   select DROP_OFF_DATE - PICKUP_DATE + 1 into numdays from nsa_rental where rental_id =rentalid;
17   SELECT dbms_random.string('U', 15) str into invnum from dual;
18   select END_ODOMETER - START_ODOMETER into distance from nsa_rental where rental_id =rentalid;
19   select DROP_OFF_DATE into invdate from nsa_rental where rental_id =rentalid;
20   SELECT RENTAL_RATE * numdays, OVER_MILEAGE_FEE into totcost, overmilfee FROM nsa_rental
21     JOIN nsa_car ON nsa_rental.vin = nsa_car.vin JOIN nsa_class ON nsa_car.class_id = nsa_class.class_id  where rental_id = rentalid;
22   SELECT Case When distance-(DAILY_LIMIT*numdays) > 0
23     THEN overmilfee ELSE 0 END into overmilfee from NSA_RENTAL where rental_id =rentalid;
24   SELECT Case When DAILY_LIMIT IS NOT NULL THEN totcost+(distance-(DAILY_LIMIT*numdays))*overmilfee
25     ELSE totcost END into totcost from NSA_RENTAL where rental_id =rentalid;
26   SELECT Case When COUPON_NUMBER IS NOT NULL then COUPON_NUMBER
27     else defcoupnum end into coupnum from NSA_RENTAL where rental_id =rentalid;
28   select Case When COUPON_NUMBER IS NOT NULL and ((VALID_FROM is null or VALID_TO is null) or invdate between VALID_FROM and VALID_TO)
29     then ((1 - DISCOUNT_PERCENT*0.01) * totcost) else totcost end into totcost from NSA_DISCOUNT where COUPON_NUMBER = coupnum;
30   INSERT INTO NSA_INVOICE(INVOICE_NUMBER,INVOICE_DATE,INVOICE_AMOUNT, RENTAL_ID) values (invnum,invdate, totcost, rentalid);
31  END;
```

Data Dictionary results of following queries:

REM: List of Tables
select table_name
from user_tables
where table_name like 'NSA%';

TABLE_NAME
NSA_ADDRESS
NSA_CAR
NSA_CLASS
NSA_CORP
NSA_CORPORATE
NSA_CUSTOMER
NSA_CUST_DISC
NSA_DISCOUNT
NSA_INDIVIDUAL
NSA_INVOICE
NSA_LOCATION
NSA_PAYMENT
NSA_RENTAL

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13 rows selected.

REM: List of Table Columns

select table_name, column_name,column_id from user_tab_columns
where table_name like 'NSA%'
order by table_name,column_id;

TABLE_NAME	COLUMN_NAME	COLUMN_ID
NSA_ADDRESS	ADDRESS_ID	1
NSA_ADDRESS	CUST_ST_ADD	2
NSA_ADDRESS	CUST_CITY	3

NSA_ADDRESS	CUST_STATE	4
NSA_ADDRESS	CUST_ZIP_CODE	5
NSA_CAR	VIN	1
NSA_CAR	MAKE	2
NSA_CAR	MODEL	3
NSA_CAR	YEAR	4
NSA_CAR	LICENSE_PLATE_NO	5
NSA_CAR	LOCATION_ID	6
NSA_CAR	CLASS_ID	7
NSA_CLASS	CLASS_ID	1
NSA_CLASS	CLASS_NAME	2
NSA_CLASS	RENTAL_RATE	3
NSA_CLASS	OVER_MILEAGE_FEE	4
NSA_CORP	CORPORATION_ID	1
NSA_CORP	CORPORATION_NAME	2
NSA_CORP	CORPORATION_REG_NO	3
NSA_CORPORATE	CUSTOMER_ID	1
NSA_CORPORATE	EMPLOYEE_ID	2
NSA_CORPORATE	CORPORATION_ID	3
NSA_CORPORATE	CUST_TYPE	4
NSA_CUSTOMER	CUSTOMER_ID	1
NSA_CUSTOMER	CUST_FNAME	2
NSA_CUSTOMER	CUST_LNAME	3

NSA_CUSTOMER	CUST_EMAIL	4
NSA_CUSTOMER	CUST_PHONE_NO	5
NSA_CUSTOMER	CUST_TYPE	6
NSA_CUSTOMER	ADDRESS_ID	7
NSA_CUST_DISC	COUPON_TYPE	1
NSA_CUST_DISC	CUSTOMER_ID	2
NSA_CUST_DISC	CUST_TYPE	3
NSA_CUST_DISC	COUPON_NUMBER	4
NSA_DISCOUNT	COUPON_NUMBER	1
NSA_DISCOUNT	DISCOUNT_PERCENT	2
NSA_DISCOUNT	VALID_FROM	3
NSA_DISCOUNT	VALID_TO	4
NSA_INDIVIDUAL	CUSTOMER_ID	1
NSA_INDIVIDUAL	LICENSE_NUMBER	2
NSA_INDIVIDUAL	INSURANCE_COMPANY	3
NSA_INDIVIDUAL	INSURANCE_NUMBER	4
NSA_INDIVIDUAL	CUST_TYPE	5
NSA_INVOICE	INVOICE_NUMBER	1
NSA_INVOICE	INVOICE_DATE	2
NSA_INVOICE	INVOICE_AMOUNT	3
NSA_INVOICE	RENTAL_ID	4
NSA_LOCATION	LOCATION_ID	1
NSA_LOCATION	OFFICE_ST_ADD	2

NSA_LOCATION	OFFICE_CITY	3
NSA_LOCATION	OFFICE_STATE	4
NSA_LOCATION	OFFICE_ZIP_CODE	5
NSA_LOCATION	OFFICE_PHONE_NO	6
NSA_PAYMENT	PAYMENT_ID	1
NSA_PAYMENT	PAYMENT_METHOD	2
NSA_PAYMENT	PAYMENT_DATE	3
NSA_PAYMENT	CARD_NUMBER	4
NSA_PAYMENT	AMOUNT_PAID	5
NSA_PAYMENT	INVOICE_NUMBER	6
NSA_RENTAL	RENTAL_ID	1
NSA_RENTAL	PICKUP_DATE	2
NSA_RENTAL	DROP_OFF_DATE	3
NSA_RENTAL	START_ODOMETER	4
NSA_RENTAL	END_ODOMETER	5
NSA_RENTAL	DAILY_LIMIT	6
NSA_RENTAL	VIN	7
NSA_RENTAL	PICK_UP_LOC_ID	8
NSA_RENTAL	DROP_OFF_LOC_ID	9
NSA_RENTAL	CUSTOMER_ID	10
NSA_RENTAL	CUST_TYPE	11
NSA_RENTAL	COUPON_NUMBER	12

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71 rows selected

REM: List of Table Column Constraints
Select
table_name,constraint_name,constraint_type,search_condition,index_name,r_constraint_name,delete_r
ule from user_constraints
where table_name like 'NSA%'
order by table_name;

: List of Table Column Constraints

TABLE_N AME	CONSTRAINT_NAME	CONSTRAI NT_TYPE	SEARCH_COND ITION	INDEX_NAM E	R_CONSTRA INT_NAME	DELET E_RUL E
NSA_ADD RESS	SYS_C0083467549	C	"CUST_ST_AD D" IS NOT NULL	-	-	-
NSA_ADD RESS	SYS_C0083467548	C	"ADDRESS_ID " IS NOT NULL	-	-	-
NSA_ADD RESS	NSA_ADDRESS_PK	P	-	NSA_ADDRE SS_PK	-	-
NSA_ADD RESS	SYS_C0083467552	C	"CUST_ZIP_C ODE" IS NOT NULL	-	-	-
NSA_ADD RESS	SYS_C0083467551	C	"CUST_STATE " IS NOT NULL	-	-	-
NSA_ADD RESS	SYS_C0083467550	C	"CUST_CITY" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467554	C	"VIN" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467555	C	"MAKE" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467556	C	"MODEL" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467558	C	"LICENSE_PL ATE_NO" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467559	C	"LOCATION_I D" IS NOT NULL	-	-	-
NSA_CAR	SYS_C0083467560	C	"CLASS_ID" IS NOT NULL	-	-	-
NSA_CAR	NSA_CAR_PK	P	-	NSA_CAR_P K	-	-
NSA_CAR	SYS_C0083467557	C	"YEAR" IS NOT NULL	-	-	-

NSA_CAR	NSA_CAR_NSA_CLASS_FK	R	–	–	NSA_CLASS_PK	NO ACTION
NSA_CAR	NSA_CAR_NSA_LOCATION_FK	R	–	–	NSA_LOCATION_PK	NO ACTION
NSA_CLASS	C_OVER_MILEAGE_FEE	C	over_mileage_fee >= 0	–	–	–
NSA_CLASS	NSA_CLASS_PK	P	–	NSA_CLASS_PK	–	–
NSA_CLASS	C_RENTAL_RATE	C	rental_rate >= 0	–	–	–
NSA_CLASS	SYS_C0083467565	C	"OVER_MILEAGE_FEE" IS NOT NULL	–	–	–
NSA_CLASS	SYS_C0083467564	C	"RENTAL_RATE" IS NOT NULL	–	–	–
NSA_CLASS	SYS_C0083467563	C	"CLASS_NAME" IS NOT NULL	–	–	–
NSA_CLASS	SYS_C0083467562	C	"CLASS_ID" IS NOT NULL	–	–	–
NSA_CORP	NSA_CORP_PK	P	–	NSA_CORP_PK	–	–
NSA_CORP	SYS_C0083467578	C	"CORPORATION_REG_NO" IS NOT NULL	–	–	–
NSA_CORP	SYS_C0083467576	C	"CORPORATION_ID" IS NOT NULL	–	–	–
NSA_CORP	SYS_C0083467577	C	"CORPORATION_NAME" IS NOT NULL	–	–	–
NSA_CORPORATE	SYS_C0083467580	C	"CUSTOMER_ID" IS NOT NULL	–	–	–
NSA_CORPORATE	NSA_CORPORATE_NSA_CORP_FK	R	–	–	NSA_CORP_PK	NO ACTION
NSA_CORPORATE	NSA_CORPORATE_PK	P	–	NSA_CORPORATE_PK	–	–
NSA_CORPORATE	NSA_CORPORATE_NSA_CUSTOMER_FK	R	–	–	NSA_CUSTOMER_PK	NO ACTION

NSA_COR PORATE	SYS_C0083467581	C	"EMPLOYEE_I D" IS NOT NULL	-	-	-
NSA_COR PORATE	SYS_C0083467582	C	"CORPORATIO N_ID" IS NOT NULL	-	-	-
NSA_COR PORATE	SYS_C0083467583	C	"CUST_TYPE" IS NOT NULL	-	-	-
NSA_CUS TOMER	CH_INH_NSA_CUSTOM ER	C	cust_type IN ('C', 'I')	-	-	-
NSA_CUS TOMER	SYS_C0083467614	C	"ADDRESS_ID " IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467613	C	"CUST_TYPE" IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467612	C	"CUST_PHONE _NO" IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467611	C	"CUST_EMAIL " IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467610	C	"CUST_LNAME " IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467609	C	"CUST_FNAME " IS NOT NULL	-	-	-
NSA_CUS TOMER	SYS_C0083467608	C	"CUSTOMER_I D" IS NOT NULL	-	-	-
NSA_CUS TOMER	NSA_CUSTOMER_NSA_ ADDRESS_FK	R	-	-	NSA_ADDRE SS_PK	NO ACTIO N
NSA_CUS TOMER	NSA_CUSTOMER_PK	P	-	NSA_CUSTO MER_PK	-	-
NSA_CUS T_DISC	SYS_C0083467590	C	"COUPON_NUM BER" IS NOT NULL	-	-	-
NSA_CUS T_DISC	SYS_C0083467589	C	"COUPON_TYP E" IS NOT NULL	-	-	-
NSA_CUS T_DISC	NSA_CUST_DISC_NSA _CUSTOMER_FK	R	-	-	NSA_CUSTO MER_PK	NO ACTIO N

NSA_CUST_DISC	NSA_CUST_DISC_NSA_DISCOUNT_FK	R	-	-	NSA_DISCOUNT_PK	NO ACTION
NSA_CUST_DISC	NSA_CUST_DISC_PK	P	-	NSA_CUST_DISC_PK	-	-
NSA_DISCOUNT	C_END_DATE	C	(valid_to - valid_from) >= 0	-	-	-
NSA_DISCOUNT	SYS_C0083467617	C	"COUPON_NUMBER" IS NOT NULL	-	-	-
NSA_DISCOUNT	SYS_C0083467618	C	"DISCOUNT_PERCENT" IS NOT NULL	-	-	-
NSA_DISCOUNT	NSA_DISCOUNT_PK	P	-	NSA_DISCOUNT_PK	-	-
NSA_INDIVIDUAL	SYS_C0083467624	C	"CUST_TYPE" IS NOT NULL	-	-	-
NSA_INDIVIDUAL	SYS_C0083467623	C	"INSURANCE_NUMBER" IS NOT NULL	-	-	-
NSA_INDIVIDUAL	SYS_C0083467622	C	"INSURANCE_COMPANY" IS NOT NULL	-	-	-
NSA_INDIVIDUAL	SYS_C0083467621	C	"LICENSE_NUMBER" IS NOT NULL	-	-	-
NSA_INDIVIDUAL	SYS_C0083467620	C	"CUSTOMER_ID" IS NOT NULL	-	-	-
NSA_INDIVIDUAL	NSA_INDIVIDUAL_PK	P	-	NSA_INDIVIDUAL_PK	-	-
NSA_INDIVIDUAL	NSA_INDIVIDUAL_NSA_CUSTOMER_FK	R	-	-	NSA_CUSTOMER_PK	NO ACTION
NSA_INVOICE	SYS_C0083467626	C	"INVOICE_NUMBER" IS NOT NULL	-	-	-
NSA_INVOICE	C_INVOICE_AMOUNT	C	invoice_amount >= 0	-	-	-
NSA_INVOICE	SYS_C0083467628	C	"INVOICE_AMOUNT" IS NOT NULL	-	-	-
NSA_INVOICE	SYS_C0083467629	C	"RENTAL_ID" IS NOT NULL	-	-	-

NSA_INVOICE	NSA_INVOICE_PK	P	–	NSA_INVOICE_PK	–	–
NSA_INVOICE	NSA_INVOICE_NSA_RENTAL_FK	R	–	–	NSA_RENTAL_PK	NO ACTION
NSA_INVOICE	SYS_C0083467627	C	"INVOICE_DATE" IS NOT NULL	–	–	–
NSA_LOCATION	SYS_C0083467636	C	"OFFICE_PHONE_NO" IS NOT NULL	–	–	–
NSA_LOCATION	NSA_LOCATION_PK	P	–	NSA_LOCATION_PK	–	–
NSA_LOCATION	SYS_C0083467635	C	"OFFICE_ZIP_CODE" IS NOT NULL	–	–	–
NSA_LOCATION	SYS_C0083467634	C	"OFFICE_STATE" IS NOT NULL	–	–	–
NSA_LOCATION	SYS_C0083467633	C	"OFFICE_CITY" IS NOT NULL	–	–	–
NSA_LOCATION	SYS_C0083467632	C	"OFFICE_ST_ADD" IS NOT NULL	–	–	–
NSA_LOCATION	SYS_C0083467631	C	"LOCATION_ID" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467649	C	"INVOICE_NUMBER" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467648	C	"AMOUNT_PAID" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467647	C	"CARD_NUMBER" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467646	C	"PAYMENT_DATE" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467645	C	"PAYMENT_METHOD" IS NOT NULL	–	–	–
NSA_PAYMENT	SYS_C0083467644	C	"PAYMENT_ID" IS NOT NULL	–	–	–

NSA_PAY MENT	NSA_PAYMENT_NSA_I NVOICE_FK	R	–	–	NSA_INVOI CE_PK	NO ACTIO N
NSA_PAY MENT	NSA_PAYMENT_PK	P	–	NSA_PAYME NT_PK	–	–
NSA_REN TAL	SYS_C0083467656	C	"VIN" IS NOT NULL	–	–	–
NSA_REN TAL	SYS_C0083467657	C	"PICK_UP_LO C_ID" IS NOT NULL	–	–	–
NSA_REN TAL	SYS_C0083467658	C	"DROP_OFF_L OC_ID" IS NOT NULL	–	–	–
NSA_REN TAL	NSA_RENTAL_NSA_CA R_FK	R	–	–	NSA_CAR_P K	NO ACTIO N
NSA_REN TAL	SYS_C0083467660	C	"CUST_TYPE" IS NOT NULL	–	–	–
NSA_REN TAL	SYS_C0083467659	C	"CUSTOMER_I D" IS NOT NULL	–	–	–
NSA_REN TAL	NSA_RENTAL_NSA_CU STOMER_FK	R	–	–	NSA_CUSTO MER_PK	NO ACTIO N
NSA_REN TAL	NSA_RENTAL_NSA_DI SCOUNT_FK	R	–	–	NSA_DISCO UNT_PK	NO ACTIO N
NSA_REN TAL	NSA_RENTAL_NSA_LO CATION_FK	R	–	–	NSA_LOCAT ION_PK	NO ACTIO N
NSA_REN TAL	SYS_C0083467655	C	"END_ODOMET ER" IS NOT NULL	–	–	–
NSA_REN TAL	SYS_C0083467654	C	"START_ODOM ETER" IS NOT NULL	–	–	–
NSA_REN TAL	SYS_C0083467653	C	"DROP_OFF_D ATE" IS NOT NULL	–	–	–
NSA_REN TAL	NSA_RENTAL_NSA_LO CATION_FKV2	R	–	–	NSA_LOCAT ION_PK	NO ACTIO N
NSA_REN TAL	SYS_C0083467651	C	"RENTAL_ID" IS NOT NULL	–	–	–

NSA_REN TAL	C_END_ODOMETER	C	(end_odomet er - start_odome ter) >= 0	-	-	-
NSA_REN TAL	C_DROP_OFF_DATE	C	(drop_off_d ate - pickup_date) >= 0	-	-	-
NSA_REN TAL	NSA_RENTAL_PK	P	-	NSA_RENTA L_PK	-	-
NSA_REN TAL	SYS_C0083467652	C	"PICKUP_DAT E" IS NOT NULL	-	-	-

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100 rows selected.

REM: List of Table Column Comments
select table_name,column_name,comments from user_col_comments
where table_name like 'NSA%'
order by table_name;

: List of Table Column Comments

TABLE_NAME	COLUMN_NAME	COMMENTS
NSA_ADDRESS	CUST_ST_ADD	This is the street address of the customer
NSA_ADDRESS	ADDRESS_ID	This is the unique address id
NSA_ADDRESS	CUST_CITY	This is the city in which customer stays
NSA_ADDRESS	CUST_STATE	This is the state in whic customer stays
NSA_ADDRESS	CUST_ZIP_CODE	This is the zip code of the customer
NSA_CAR	MAKE	This is the company that made that car
NSA_CAR	VIN	This is a unique vehicle identification number

NSA_CAR	MODEL	This is the model of the car
NSA_CAR	CLASS_ID	-
NSA_CAR	LOCATION_ID	-
NSA_CAR	LICENSE_PLATE_NO	This the license plate number of the car
NSA_CAR	YEAR	This is the year in which car is manufactured
NSA_CLASS	CLASS_NAME	This is the name of the car class
NSA_CLASS	CLASS_ID	This is the class Id of the car
NSA_CLASS	RENTAL_RATE	This is the rental rate per day of the car class
NSA_CLASS	OVER_MILEAGE_FEE	This is the ocer mileage fee for that car class
NSA_CORP	CORPORATION_ID	This is the unique corporation ID
NSA_CORP	CORPORATION_REG_NO	This is the registration number of the corporation
NSA_CORP	CORPORATION_NAME	This is the name of the corporation
NSA_CORPORATE	CORPORATION_ID	-
NSA_CORPORATE	EMPLOYEE_ID	This is the unique employee ID
NSA_CORPORATE	CUSTOMER_ID	This is the unique customer ID
NSA_CORPORATE	CUST_TYPE	This is the customer type discriminator

NSA_CUSTOMER	CUST_LNAME	This is the last name of the customer
NSA_CUSTOMER	CUST_FNAME	This is the first name of the customer
NSA_CUSTOMER	CUSTOMER_ID	This is the unique customer ID
NSA_CUSTOMER	CUST_EMAIL	This is the email id of the customer
NSA_CUSTOMER	ADDRESS_ID	-
NSA_CUSTOMER	CUST_TYPE	This is the customer type discriminator
NSA_CUSTOMER	CUST_PHONE_NO	This is the phone number of the customer
NSA_CUST_DISC	CUSTOMER_ID	-
NSA_CUST_DISC	CUST_TYPE	-
NSA_CUST_DISC	COUPON_TYPE	This is the type of the coupon customer has.
NSA_CUST_DISC	COUPON_NUMBER	-
NSA_DISCOUNT	COUPON_NUMBER	This is the unique coupon number
NSA_DISCOUNT	DISCOUNT_PERCENT	This is Percentage of the discount offered.
NSA_DISCOUNT	VALID_FROM	This is the data the coupon is valid from
NSA_DISCOUNT	VALID_TO	This is the data the coupon is valid to.
NSA_INDIVIDUAL	LICENSE_NUMBER	This is the license number of the individual customer

NSA_INDIVIDUAL	CUSTOMER_ID	This is the unique customer ID
NSA_INDIVIDUAL	INSURANCE_COMPANY	This is the name of the insurance company
NSA_INDIVIDUAL	INSURANCE_NUMBER	This is the insurance number of the individual customer.
NSA_INDIVIDUAL	CUST_TYPE	This is the customer type discriminator
NSA_INVOICE	INVOICE_DATE	This is date on which invoice is generated
NSA_INVOICE	INVOICE_NUMBER	This is the Invoice number
NSA_INVOICE	INVOICE_AMOUNT	This is amount the customer should pay.
NSA_INVOICE	RENTAL_ID	-
NSA_LOCATION	LOCATION_ID	This is the unique location ID
NSA_LOCATION	OFFICE_ST_ADD	This is the street address of the office.
NSA_LOCATION	OFFICE_CITY	This is the city in which office is loacted
NSA_LOCATION	OFFICE_STATE	This is the state in which office is located
NSA_LOCATION	OFFICE_ZIP_CODE	This is the Zip code of the office location.
NSA_LOCATION	OFFICE_PHONE_NO	This is the phone number of the office
NSA_PAYMENT	PAYMENT_ID	This is the unique payment ID

NSA_PAYMENT	PAYMENT_METHOD	This is the method of the payment
NSA_PAYMENT	INVOICE_NUMBER	-
NSA_PAYMENT	AMOUNT_PAID	This is the amount for which payment is made
NSA_PAYMENT	CARD_NUMBER	This the card number used for the payment
NSA_PAYMENT	PAYMENT_DATE	This is the data on which payment is made
NSA_RENTAL	RENTAL_ID	This is the unique rental service id
NSA_RENTAL	PICKUP_DATE	This is the pick up date of the vehicle
NSA_RENTAL	DROP_OFF_DATE	This is the drop off date of the vehicle
NSA_RENTAL	START_ODOMETER	This is the odometer reading at the pick up time
NSA_RENTAL	END_ODOMETER	This is the drop off time odometer reading
NSA_RENTAL	COUPON_NUMBER	-
NSA_RENTAL	VIN	-
NSA_RENTAL	CUST_TYPE	-
NSA_RENTAL	CUSTOMER_ID	-
NSA_RENTAL	DROP_OFF_LOC_ID	-
NSA_RENTAL	PICK_UP_LOC_ID	-
NSA_RENTAL	DAILY_LIMIT	This is the daily odometer limit of the vehicle

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71 rows selected.