NetID: jc12300

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Course: CSGY-6083-Principles of Database Systems

Section: B

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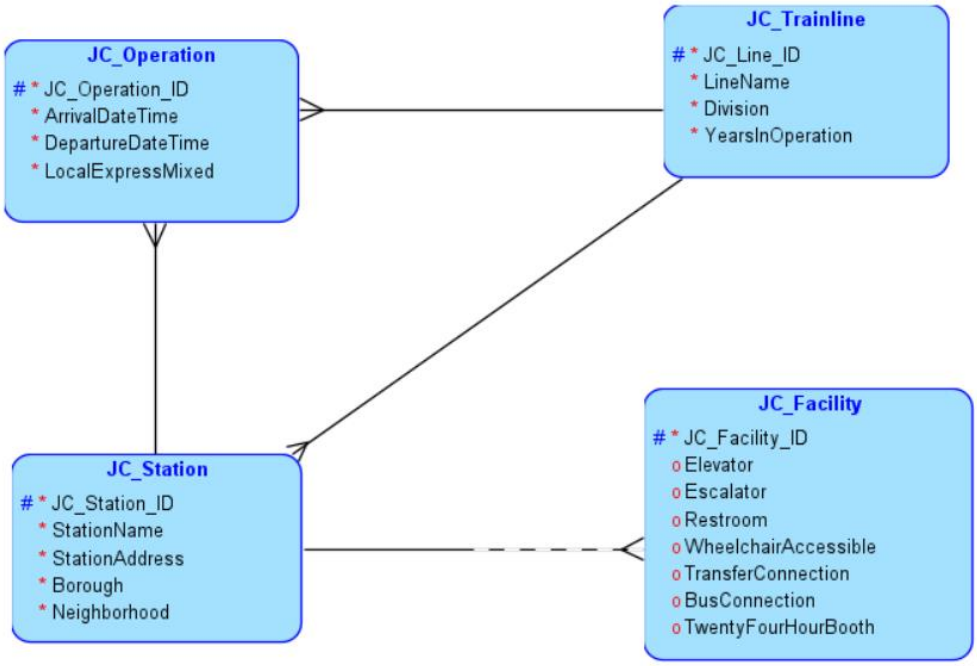
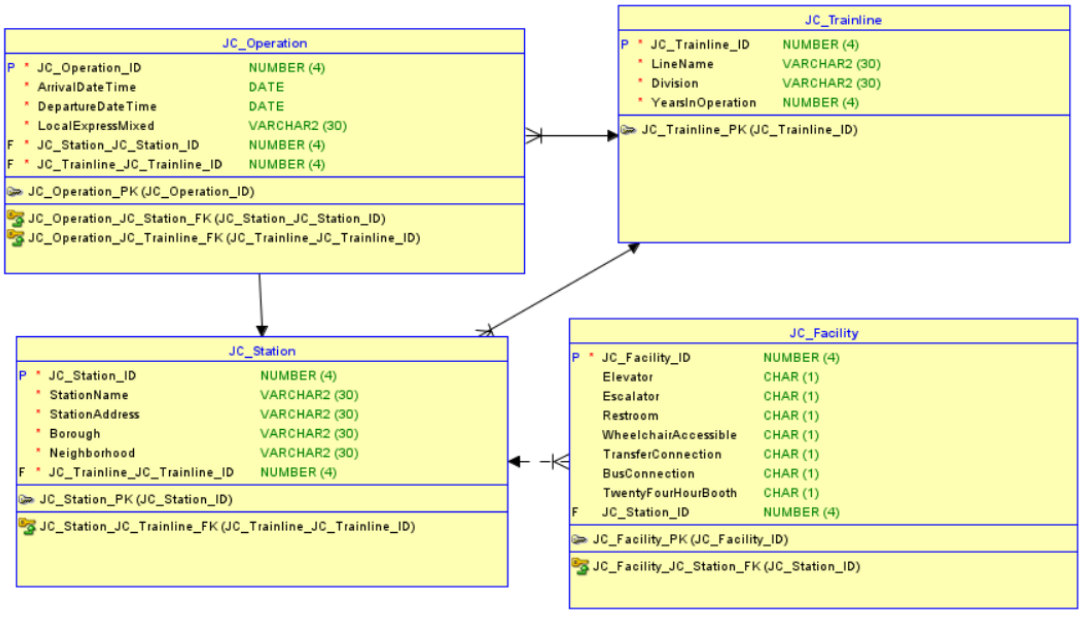
SAMTA
Logical Model



Relational Model



Assumptions

1. Each Train Line can serve multiple Subway Stations. (One-to-Many)
2. Each Subway Station can have multiple Facilities, but it's optional. (One-to-

Many)

3. Subway Operations are associated with both Train Lines and Subway Stations.

DDL code

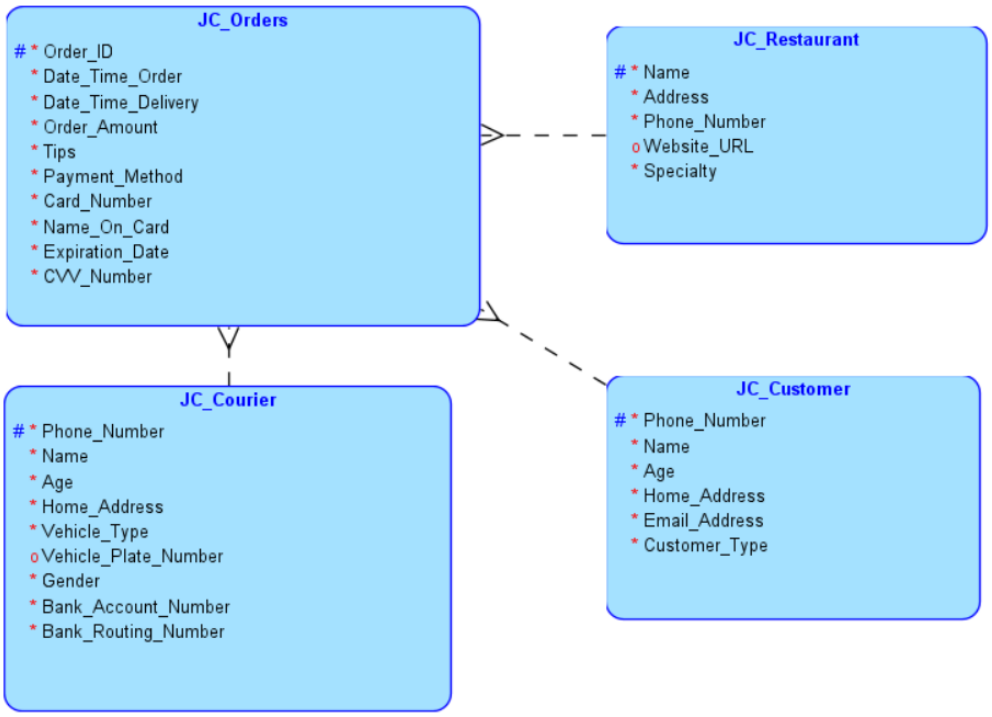
```
-- Generated by Oracle SQL Developer Data Modeler 23.1.0.087.0806
--   at:        2023-10-12 01:50:31 EDT
--   site:      Oracle Database 11g
--   type:      Oracle Database 11g



-- predefined type, no DDL - MDSYS.SDO_GEOMETRY

-- predefined type, no DDL - XMLTYPE

CREATE TABLE jc_facility (
    jc_facility_id       NUMBER(4)
        CONSTRAINT nnc_jc_facility_facilityid NOT NULL,
    elevator             CHAR(1),
    escalator            CHAR(1),
    restroom             CHAR(1),
    wheelchairaccessible CHAR(1),
    transferconnection   CHAR(1),
    busconnection        CHAR(1),
    twentyfourhourbooth  CHAR(1),
    jc_station_id        NUMBER(4)
);

COMMENT ON TABLE jc_facility IS
    'FacilityID
';

ALTER TABLE jc_facility ADD CONSTRAINT jc_facility_pk PRIMARY KEY
( jc_facility_id );

CREATE TABLE jc_operation (
    jc_operation_id             NUMBER(4) NOT NULL,
    arrivaldatetime             DATE NOT NULL,
    departuredatetime           DATE NOT NULL,
    localexpressmixed           VARCHAR2(30) NOT NULL,
    jc_station_jc_station_id    NUMBER(4)
        CONSTRAINT nnc_jc_operation_jc_station_id NOT NULL,
    jc_trainline_jc_trainline_id NUMBER(4) NOT NULL
);
```

```
COMMENT ON TABLE jc_operation IS
    'OperationID';

ALTER TABLE jc_operation ADD CONSTRAINT jc_operation_pk PRIMARY KEY
( jc_operation_id );

CREATE TABLE jc_station (
    jc_station_id               NUMBER(4)
        CONSTRAINT nnc_jc_station_jc_station_id NOT NULL,
    stationname                 VARCHAR2(30)
        CONSTRAINT nnc_jc_station_stationname NOT NULL,
    stationaddress              VARCHAR2(30)
        CONSTRAINT nnc_jc_station_stationaddress NOT NULL,
    borough                     VARCHAR2(30)
        CONSTRAINT nnc_jc_station_borough NOT NULL,
    neighborhood                VARCHAR2(30)
        CONSTRAINT nnc_jc_station_neighborhood NOT NULL,
    jc_trainline_jc_trainline_id NUMBER(4)
        CONSTRAINT nnc_jc_station_jc_trainline_id NOT NULL
);

COMMENT ON TABLE jc_station IS
    'StationID';

ALTER TABLE jc_station ADD CONSTRAINT jc_station_pk PRIMARY KEY
( jc_station_id );

CREATE TABLE jc_trainline (
    jc_trainline_id  NUMBER(4) NOT NULL,
    linename         VARCHAR2(30)
        CONSTRAINT nnc_jc_trainline_linename NOT NULL,
    division         VARCHAR2(30)
        CONSTRAINT nnc_jc_trainline_division NOT NULL,
    yearsinoperation NUMBER(4) NOT NULL
);

COMMENT ON TABLE jc_trainline IS
    'TrainID';

ALTER TABLE jc_trainline ADD CONSTRAINT jc_trainline_pk PRIMARY KEY
( jc_trainline_id );

ALTER TABLE jc_facility
```

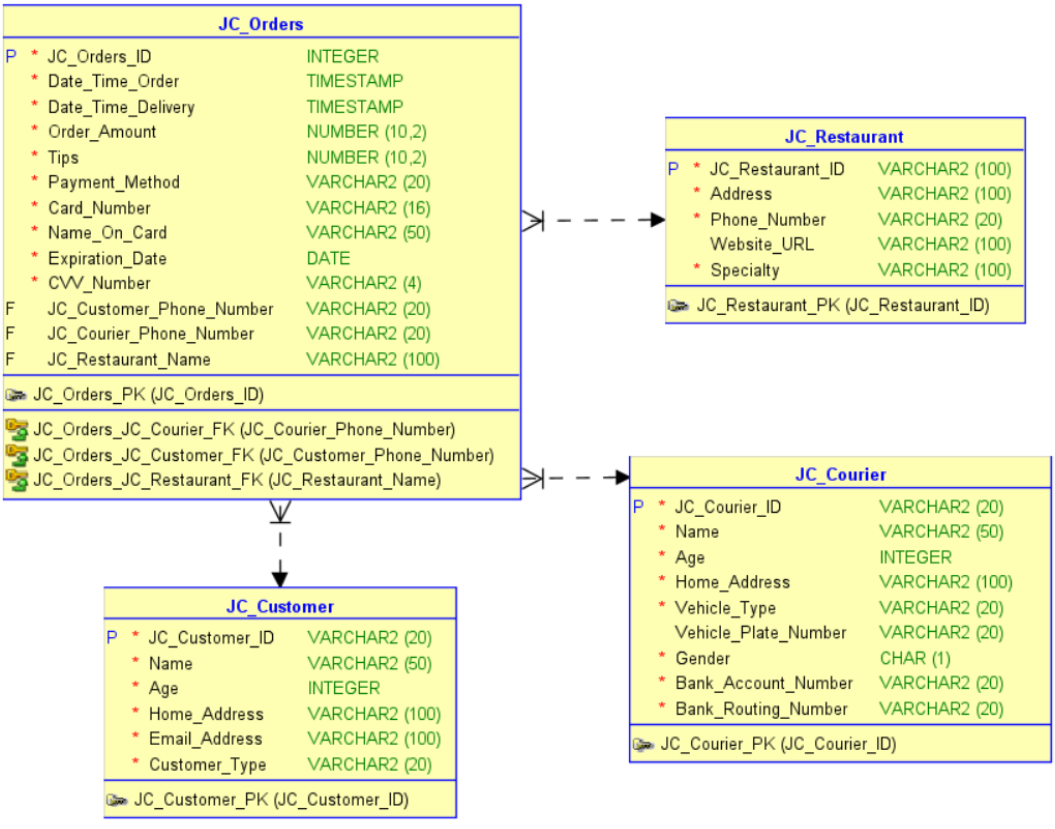
```
    ADD CONSTRAINT jc_facility_jc_station_fk FOREIGN KEY
( jc_station_id )
        REFERENCES jc_station ( jc_station_id );

ALTER TABLE jc_operation
    ADD CONSTRAINT jc_operation_jc_station_fk FOREIGN KEY
( jc_station_jc_station_id )
        REFERENCES jc_station ( jc_station_id );

ALTER TABLE jc_operation
    ADD CONSTRAINT jc_operation_jc_trainline_fk FOREIGN KEY
( jc_trainline_jc_trainline_id )
        REFERENCES jc_trainline ( jc_trainline_id );

ALTER TABLE jc_station
    ADD CONSTRAINT jc_station_jc_trainline_fk FOREIGN KEY
( jc_trainline_jc_trainline_id )
        REFERENCES jc_trainline ( jc_trainline_id );



-- Oracle SQL Developer Data Modeler Summary Report:
--
-- CREATE TABLE                             4
-- CREATE INDEX                             0
-- ALTER TABLE                              8
-- CREATE VIEW                              0
-- ALTER VIEW                               0
-- CREATE PACKAGE                           0
-- CREATE PACKAGE BODY                      0
-- CREATE PROCEDURE                         0
-- CREATE FUNCTION                          0
-- CREATE TRIGGER                           0
-- 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
```

UEAT
Logical Model



Relational Model



Assumptions

1. Couriers can have many Orders (one-to-many relationship).
2. Customers can place many Orders (one-to-many relationship).
3. Restaurants can receive many Orders (one-to-many relationship).
4. Each Order is associated with one Courier, one Customer, and one Restaurant.

DDL code

```
-- Generated by Oracle SQL Developer Data Modeler 23.1.0.087.0806
--   at:        2023-10-12 16:36:55 EDT
--   site:      Oracle Database 11g
--   type:      Oracle Database 11g



-- predefined type, no DDL - MDSYS.SDO_GEOMETRY

-- predefined type, no DDL - XMLTYPE

CREATE TABLE jc_courier (
    jc_courier_id        VARCHAR2(20)
        CONSTRAINT nnc_jc_courier_phone_number NOT NULL,
    name                 VARCHAR2(50)
        CONSTRAINT nnc_jc_courier_name NOT NULL,
    age                  INTEGER
        CONSTRAINT nnc_jc_courier_age NOT NULL,
    home_address         VARCHAR2(100)
        CONSTRAINT nnc_jc_courier_home_address NOT NULL,
    vehicle_type         VARCHAR2(20)
        CONSTRAINT nnc_jc_courier_vehicle_type NOT NULL,
    vehicle_plate_number VARCHAR2(20),
    gender               CHAR(1)
        CONSTRAINT nnc_jc_courier_gender NOT NULL,
    bank_account_number  VARCHAR2(20) NOT NULL,
    bank_routing_number  VARCHAR2(20) NOT NULL
);

COMMENT ON TABLE jc_courier IS
    'Courier';

ALTER TABLE jc_courier ADD CONSTRAINT jc_courier_pk PRIMARY KEY
( jc_courier_id );

CREATE TABLE jc_customer (
    jc_customer_id VARCHAR2(20)
```

```
        CONSTRAINT nnc_jc_customer_phone_number NOT NULL,
    name           VARCHAR2(50)
        CONSTRAINT nnc_jc_customer_name NOT NULL,
    age            INTEGER
        CONSTRAINT nnc_jc_customer_age NOT NULL,
    home_address   VARCHAR2(100)
        CONSTRAINT nnc_jc_customer_home_address NOT NULL,
    email_address  VARCHAR2(100)
        CONSTRAINT nnc_jc_customer_email_address NOT NULL,
    customer_type  VARCHAR2(20)
        CONSTRAINT nnc_jc_customer_customer_type NOT NULL
);

COMMENT ON TABLE jc_customer IS
    'Customer';

ALTER TABLE jc_customer ADD CONSTRAINT jc_customer_pk PRIMARY KEY
( jc_customer_id );

CREATE TABLE jc_orders (
    jc_orders_id             INTEGER
        CONSTRAINT nnc_jc_orders_order_id NOT NULL,
    date_time_order          TIMESTAMP
        CONSTRAINT nnc_jc_orders_date_time_order NOT NULL,
    date_time_delivery       TIMESTAMP NOT NULL,
    order_amount             NUMBER(10, 2)
        CONSTRAINT nnc_jc_orders_order_amount NOT NULL,
    tips                     NUMBER(10, 2)
        CONSTRAINT nnc_jc_orders_tips NOT NULL,
    payment_method           VARCHAR2(20)
        CONSTRAINT nnc_jc_orders_payment_method NOT NULL,
    card_number              VARCHAR2(16)
        CONSTRAINT nnc_jc_orders_card_number NOT NULL,
    name_on_card             VARCHAR2(50)
        CONSTRAINT nnc_jc_orders_name_on_card NOT NULL,
    expiration_date          DATE
        CONSTRAINT nnc_jc_orders_expiration_date NOT NULL,
    cvv_number               VARCHAR2(4)
        CONSTRAINT nnc_jc_orders_cvv_number NOT NULL,
    jc_customer_phone_number VARCHAR2(20),
    jc_courier_phone_number  VARCHAR2(20),
    jc_restaurant_name       VARCHAR2(100)
);
```

```
COMMENT ON TABLE jc_orders IS
    'Orders';

ALTER TABLE jc_orders ADD CONSTRAINT jc_orders_pk PRIMARY KEY
( jc_orders_id );

CREATE TABLE jc_restaurant (
    jc_restaurant_id VARCHAR2(100)
        CONSTRAINT nnc_jc_restaurant_name NOT NULL,
    address          VARCHAR2(100)
        CONSTRAINT nnc_jc_restaurant_address NOT NULL,
    phone_number     VARCHAR2(20)
        CONSTRAINT nnc_jc_restaurant_phone_number NOT NULL,
    website_url      VARCHAR2(100),
    specialty        VARCHAR2(100)
        CONSTRAINT nnc_jc_restaurant_specialty NOT NULL
);

COMMENT ON TABLE jc_restaurant IS
    'Restaurant';

ALTER TABLE jc_restaurant ADD CONSTRAINT jc_restaurant_pk PRIMARY KEY
( jc_restaurant_id );

ALTER TABLE jc_orders
    ADD CONSTRAINT jc_orders_jc_courier_fk FOREIGN KEY
( jc_courier_phone_number )
        REFERENCES jc_courier ( jc_courier_id );

ALTER TABLE jc_orders
    ADD CONSTRAINT jc_orders_jc_customer_fk FOREIGN KEY
( jc_customer_phone_number )
        REFERENCES jc_customer ( jc_customer_id );

ALTER TABLE jc_orders
    ADD CONSTRAINT jc_orders_jc_restaurant_fk FOREIGN KEY
( jc_restaurant_name )
        REFERENCES jc_restaurant ( jc_restaurant_id );



-- Oracle SQL Developer Data Modeler Summary Report:
--
-- CREATE TABLE                             4
-- CREATE INDEX                             0
```

```
-- ALTER TABLE                          7
-- CREATE VIEW                          0
-- ALTER VIEW                           0
-- CREATE PACKAGE                       0
-- CREATE PACKAGE BODY                  0
-- CREATE PROCEDURE                     0
-- CREATE FUNCTION                      0
-- CREATE TRIGGER                       0
-- 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
```