Faculty of Technology and Engineering

Chandubhai S. Patel Institute of Technology (CSPIT)

Department of Computer Science & Engineering

Date: / /

Laboratory Manual

Academic Year	:	2024-25	Semester	:	4
Course code	:	CSE206	Course name	:	DATABASE MANAGEMENT SYSTEM

Practical - 8
AIM - You are tasked with designing a database for managing a sales and client management system. The database should support the creation, updating, and querying of data related to salespeople, customers, orders, and clients while ensuring data integrity through constraints. (Refer the attached excel sheet for Database).

Tasks:-

1. **Managing Salespeople Information:** The organization needs a table to store data about its salespeople. Each salesperson must have a unique ID, a name, and optionally, a city and commission rate.

Tasks: 1. Create the Salespeople Table:

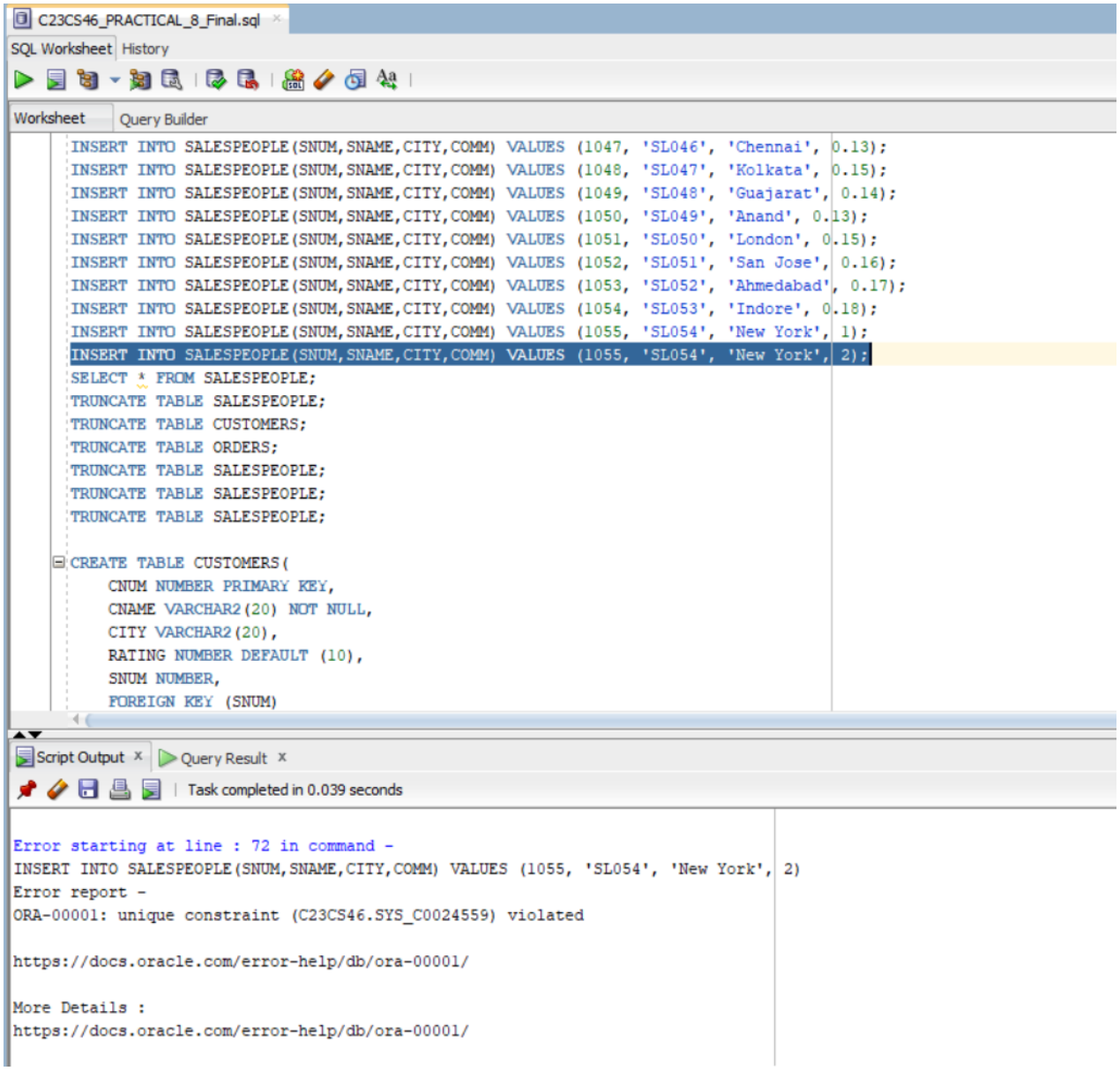
- **Attributes:**
  - Snum: Salesperson ID (Primary Key, number).
  - Sname: Salesperson Name (Not Null).
  - City: City (nullable).
  - Comm: Commission Rate (nullable).

Constraints:

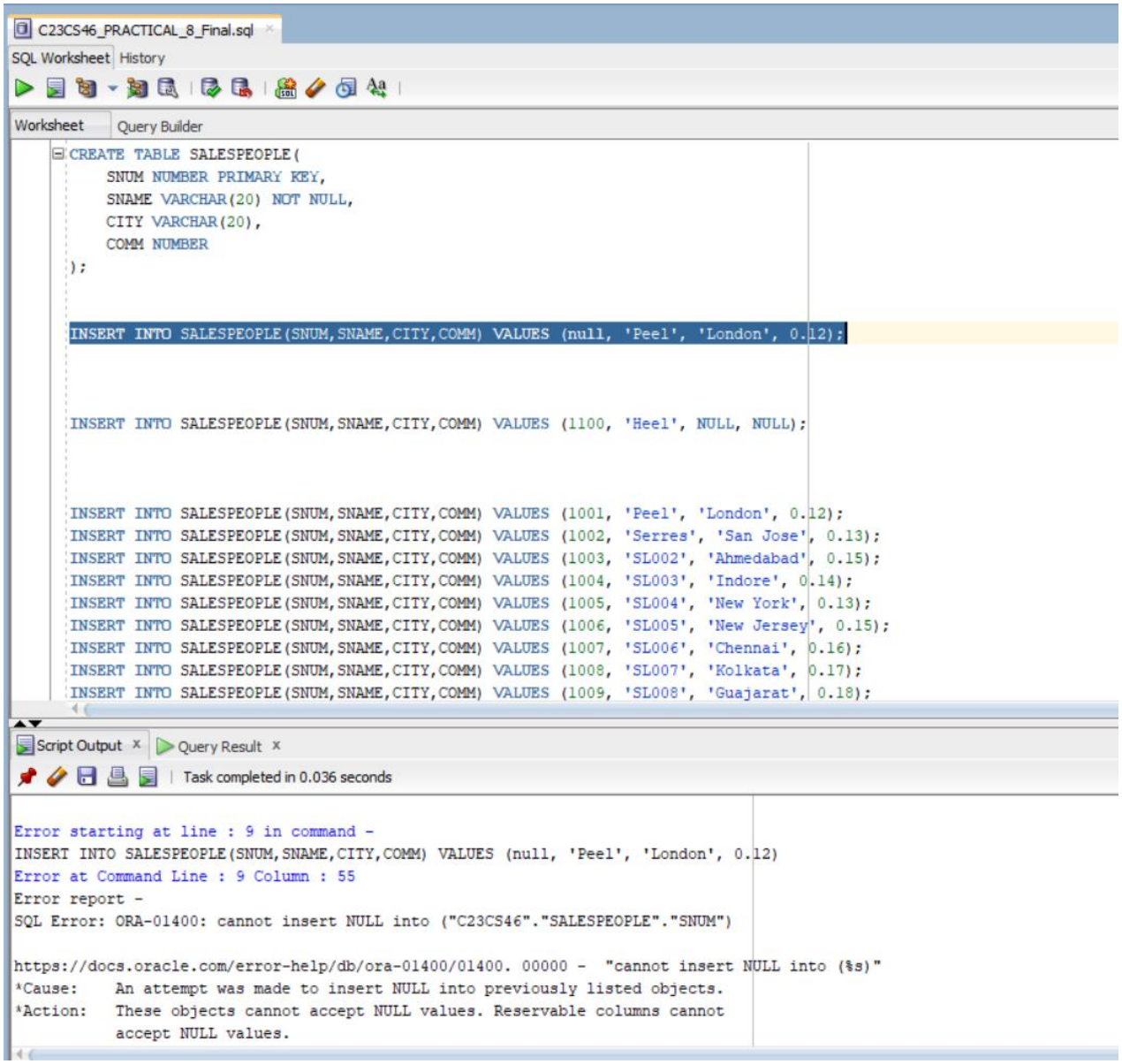
- Primary Key Constraint: Ensure Snum uniquely identifies each record.
- Not Null Constraint: Ensure Sname is not null.

2.Test Cases:

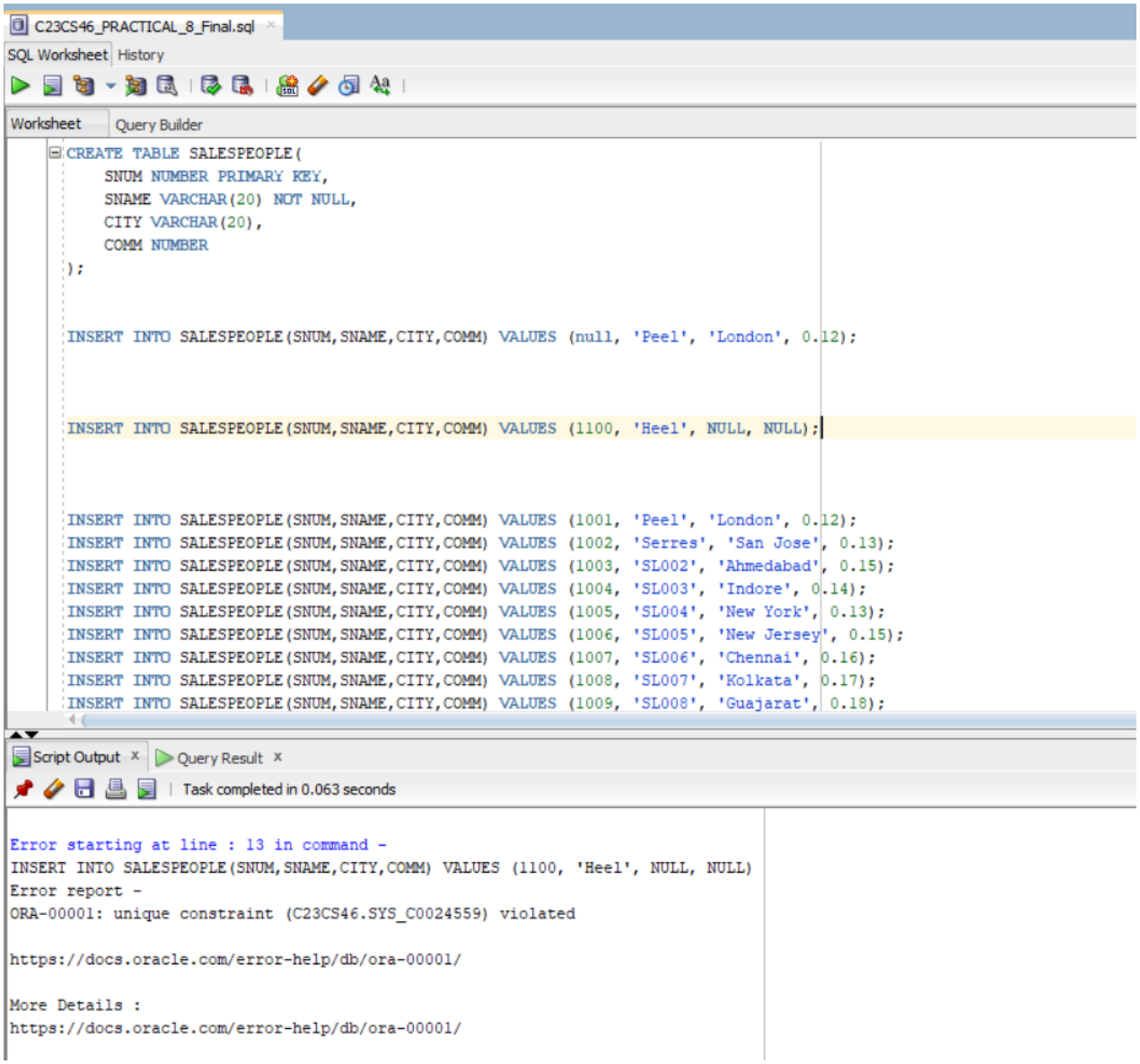
o Try inserting a record with duplicate Snum and ensure the system rejects it.



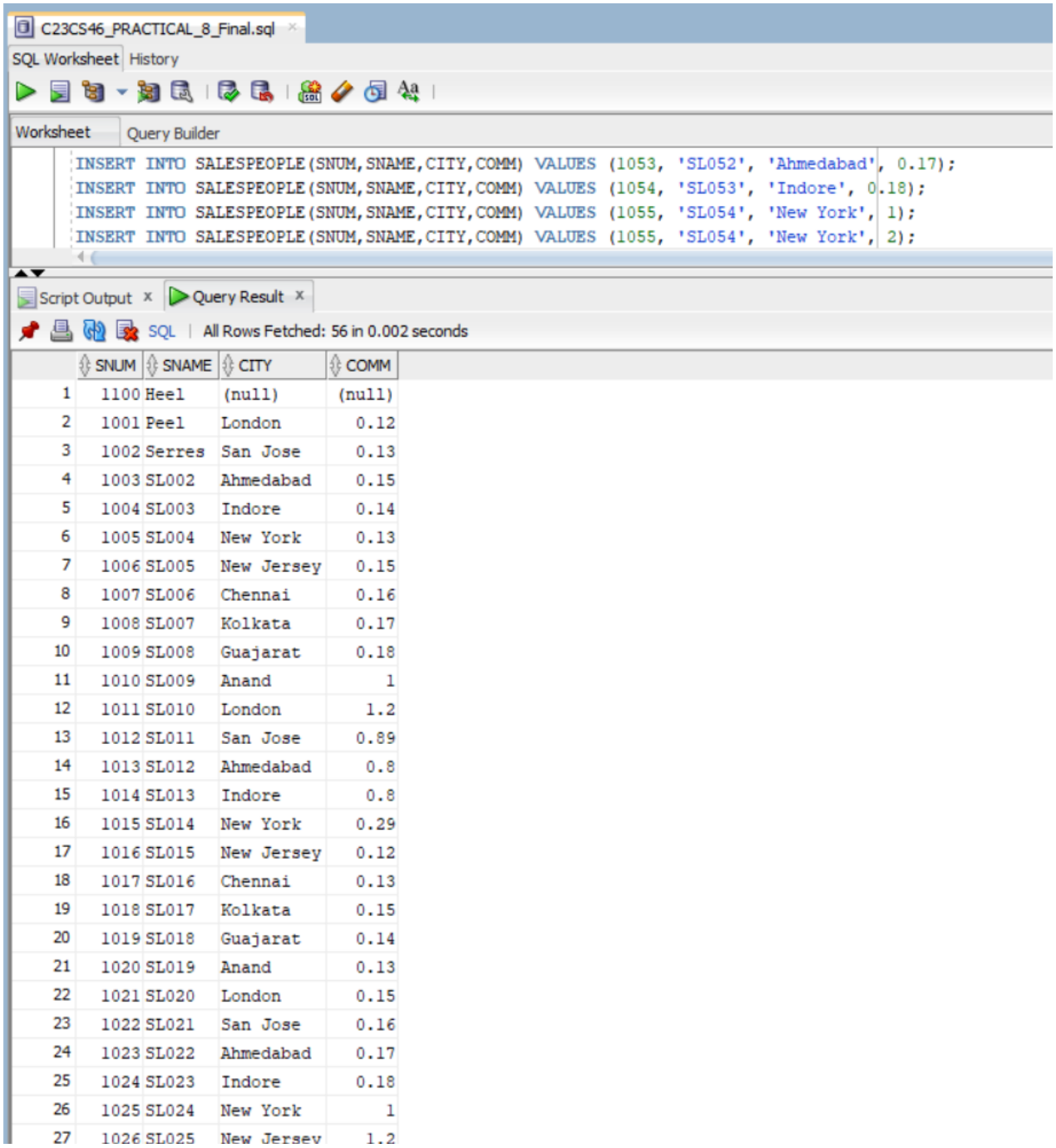
o Attempt to insert a record with a null Sname and ensure it fails.



o Insert a record with null City and Comm and ensure it is allowed.



o Retrieve all records from the Salespeople table to verify data integrity.



	SNUM	SNAME	CITY	COMM
1	1100	Heel	(null)	(null)
2	1001	Peel	London	0.12
3	1002	Serres	San Jose	0.13
4	1003	SL002	Ahmedabad	0.15
5	1004	SL003	Indore	0.14
6	1005	SL004	New York	0.13
7	1006	SL005	New Jersey	0.15
8	1007	SL006	Chennai	0.16
9	1008	SL007	Kolkata	0.17
10	1009	SL008	Guajarat	0.18
11	1010	SL009	Anand	1
12	1011	SL010	London	1.2
13	1012	SL011	San Jose	0.89
14	1013	SL012	Ahmedabad	0.8
15	1014	SL013	Indore	0.8
16	1015	SL014	New York	0.29
17	1016	SL015	New Jersey	0.12
18	1017	SL016	Chennai	0.13
19	1018	SL017	Kolkata	0.15
20	1019	SL018	Guajarat	0.14
21	1020	SL019	Anand	0.13
22	1021	SL020	London	0.15
23	1022	SL021	San Jose	0.16
24	1023	SL022	Ahmedabad	0.17
25	1024	SL023	Indore	0.18
26	1025	SL024	New York	1
27	1026	SL025	New Jersey	1.2

2. **Managing Customer Information:** The system must store customer details, including their relationship with salespeople. Customers have unique IDs, names, and optionally a city. They also have a rating with a default value.

Tasks:

1. **Create the Customer Table:**
   - Attributes:
     - Cnum: Customer ID (Primary Key, number).
     - Cname: Customer Name (Not Null).

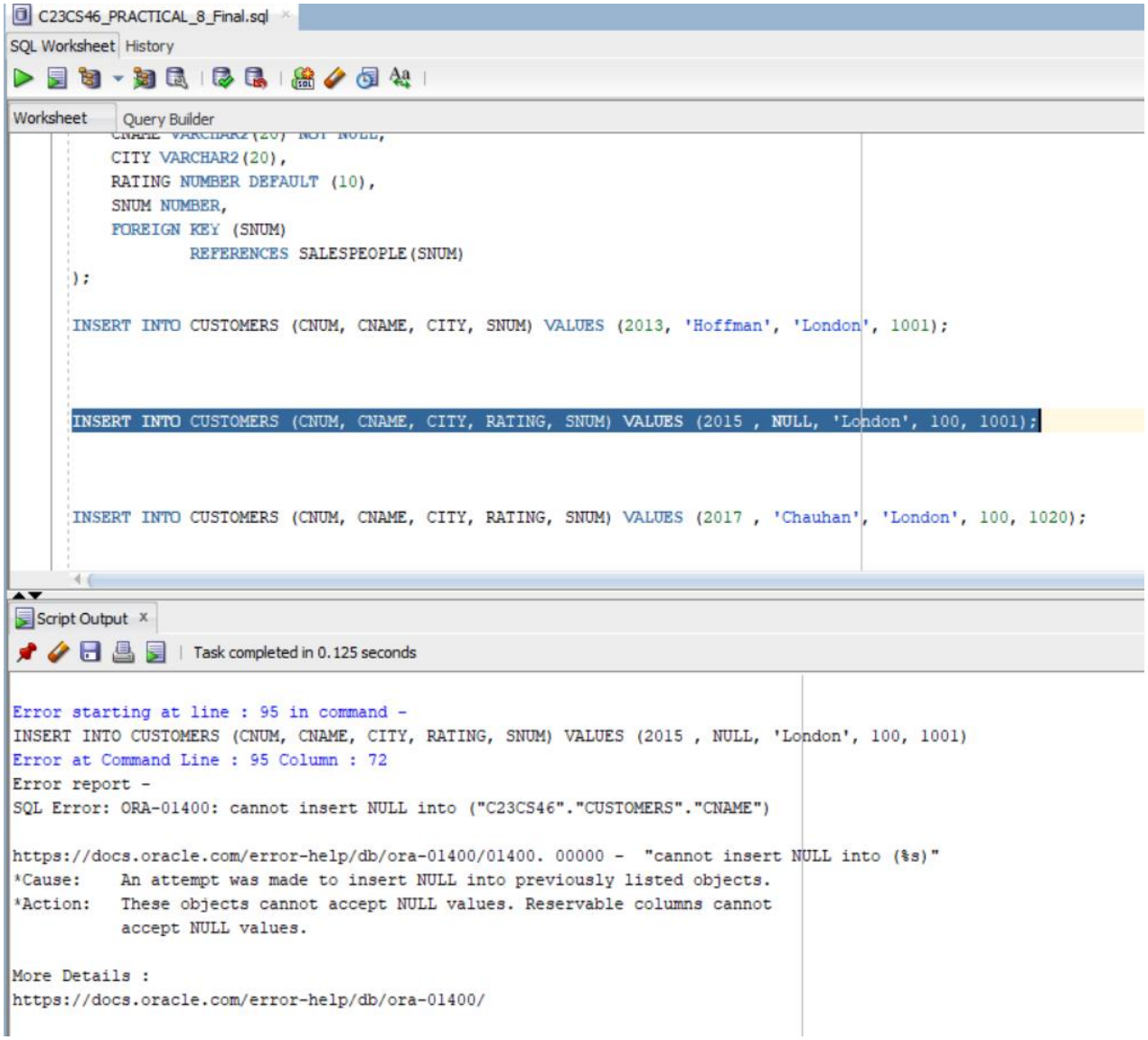
- City: City (nullable).
- Rating: Customer rating (Default: 10).
- Snum: Salesperson ID (Foreign Key references Salespeople).

Constraints:

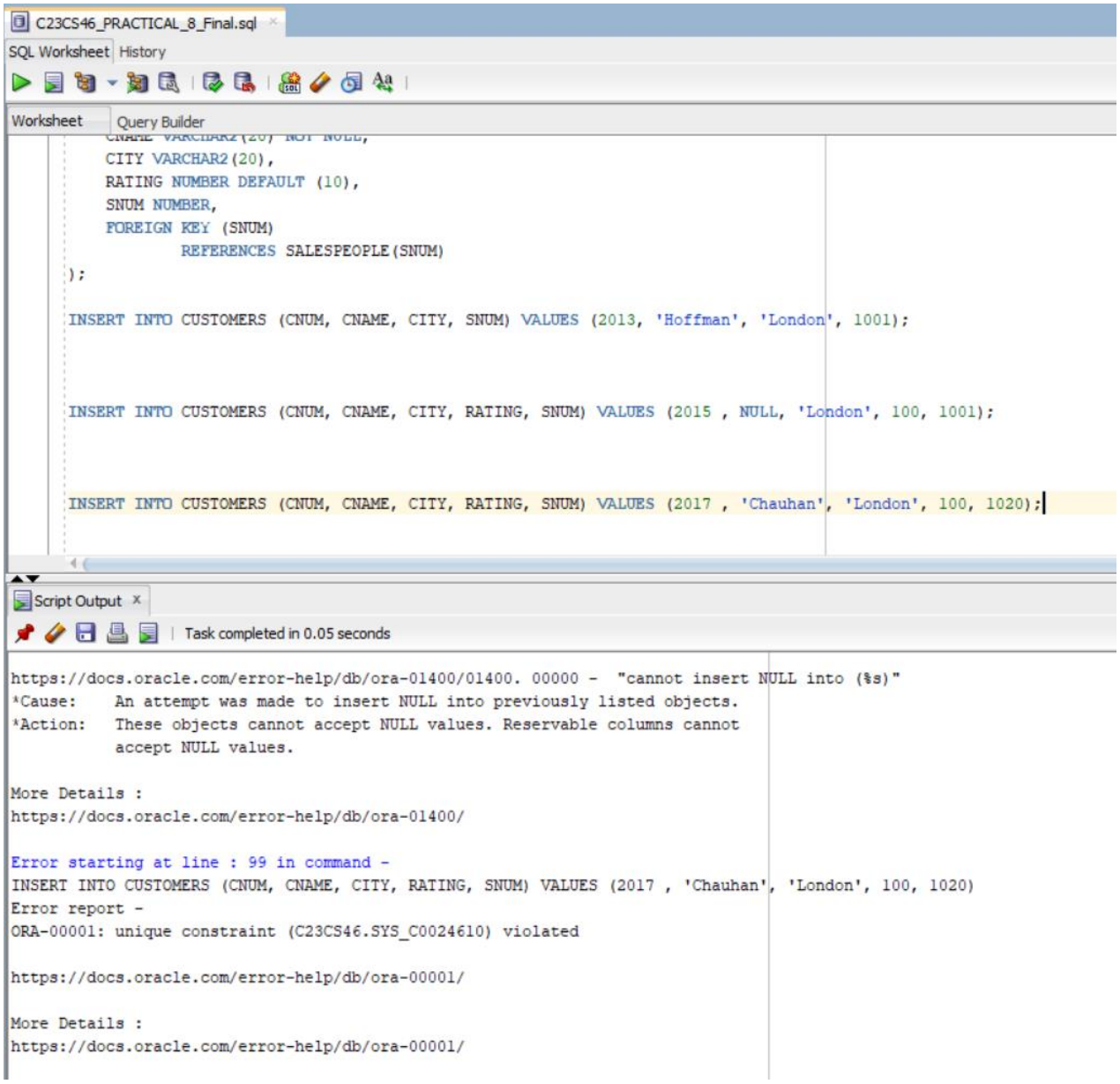
- Primary Key Constraint: Ensure Cnum uniquely identifies each record.
- Foreign Key Constraint: Ensure Snum references Salespeople(Snum).
- Default Constraint: Ensure Rating defaults to 10 when not provided.

2. Test Cases:

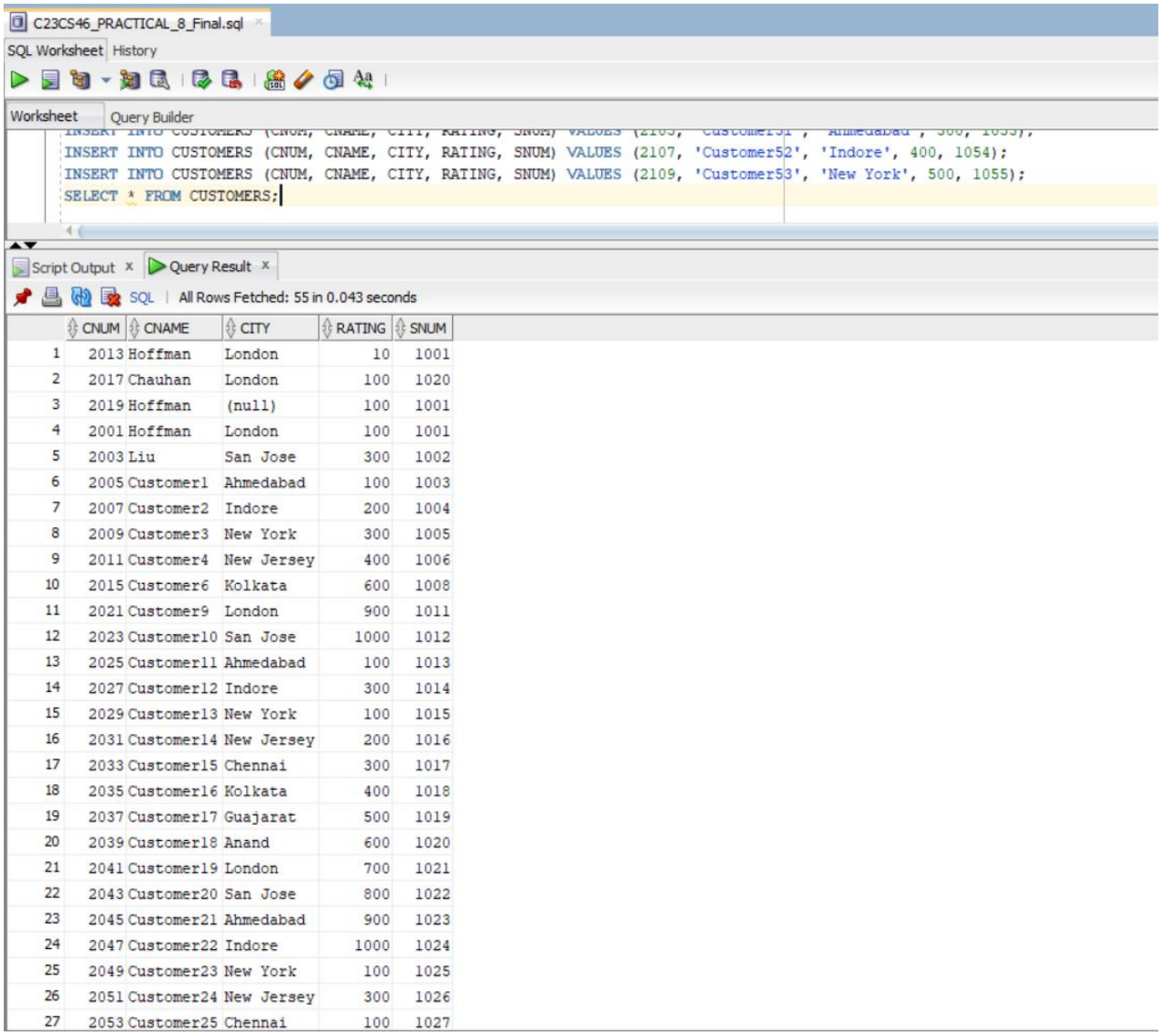
- Attempt to insert a record with null Cname and ensure it fails.



- Try inserting a record with a non-existent Snum and ensure it fails.



- Retrieve all records from the Customer table to verify the data.



	CNUM	CNAME	CITY	RATING	SNUM
1	2013	Hoffman	London	10	1001
2	2017	Chauhan	London	100	1020
3	2019	Hoffman	(null)	100	1001
4	2001	Hoffman	London	100	1001
5	2003	Liu	San Jose	300	1002
6	2005	Customer1	Ahmedabad	100	1003
7	2007	Customer2	Indore	200	1004
8	2009	Customer3	New York	300	1005
9	2011	Customer4	New Jersey	400	1006
10	2015	Customer6	Kolkata	600	1008
11	2021	Customer9	London	900	1011
12	2023	Customer10	San Jose	1000	1012
13	2025	Customer11	Ahmedabad	100	1013
14	2027	Customer12	Indore	300	1014
15	2029	Customer13	New York	100	1015
16	2031	Customer14	New Jersey	200	1016
17	2033	Customer15	Chennai	300	1017
18	2035	Customer16	Kolkata	400	1018
19	2037	Customer17	Guajarat	500	1019
20	2039	Customer18	Anand	600	1020
21	2041	Customer19	London	700	1021
22	2043	Customer20	San Jose	800	1022
23	2045	Customer21	Ahmedabad	900	1023
24	2047	Customer22	Indore	1000	1024
25	2049	Customer23	New York	100	1025
26	2051	Customer24	New Jersey	300	1026
27	2053	Customer25	Chennai	100	1027

3. **Managing Orders:** The company tracks orders placed by customers, which are managed by salespeople. Each order has an ID, amount, date, and links to customers and salesman.

Tasks:

1. Create the Order Table:

   Attributes:

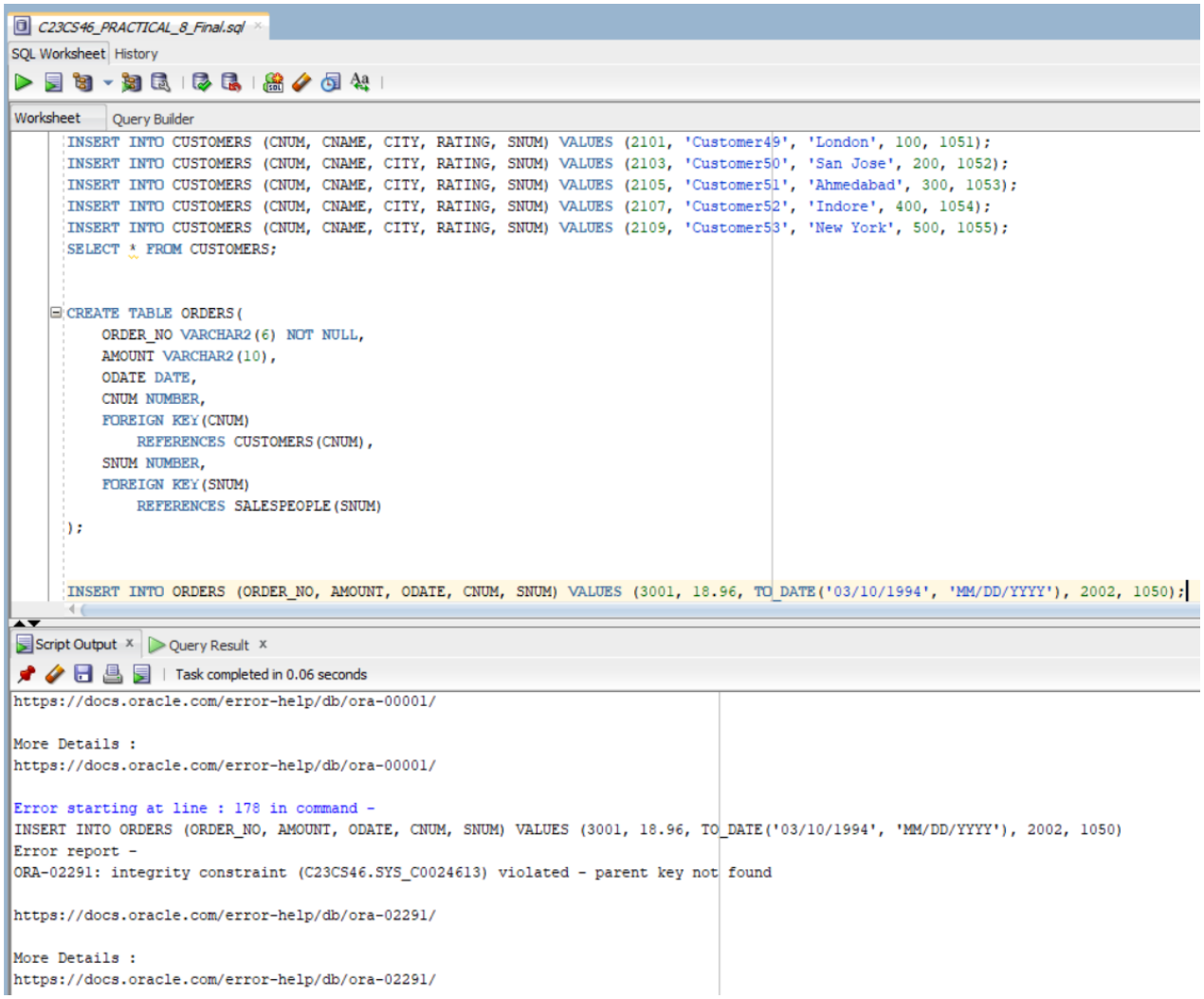
   - Order_no: Order Number (Primary Key, number).
   - Amount: Order Amount (nullable).
   - Odate: Order Date (nullable).
   - Cnum: Customer ID (Foreign Key references Customer).
   - Snum: Salesperson ID (Foreign Key references Salespeople).

Constraints:

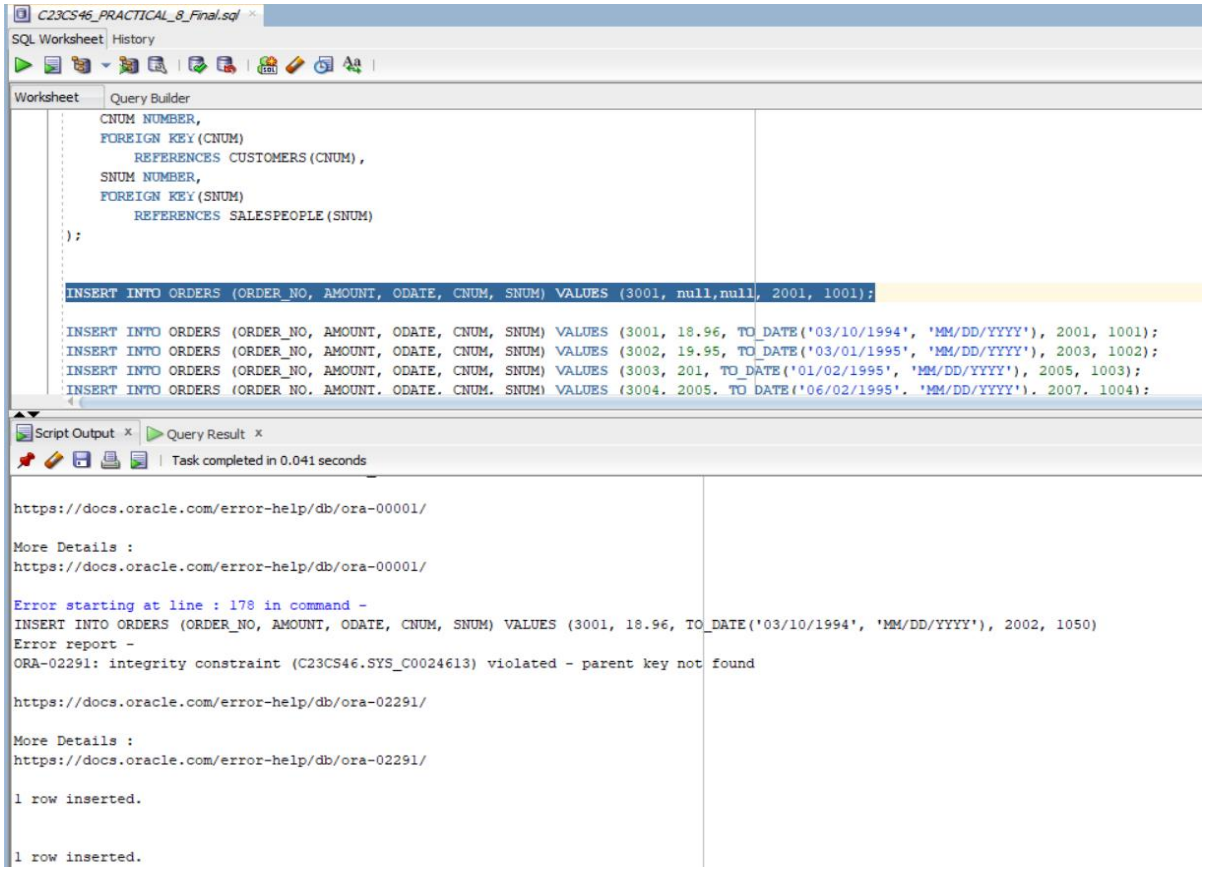
- Primary Key Constraint: Ensure Order_no uniquely identifies each record.
- Foreign Key Constraint: Ensure Cnum references Customer(Cnum).

- Foreign Key Constraint: Ensure Snum references Salespeople(Snum).

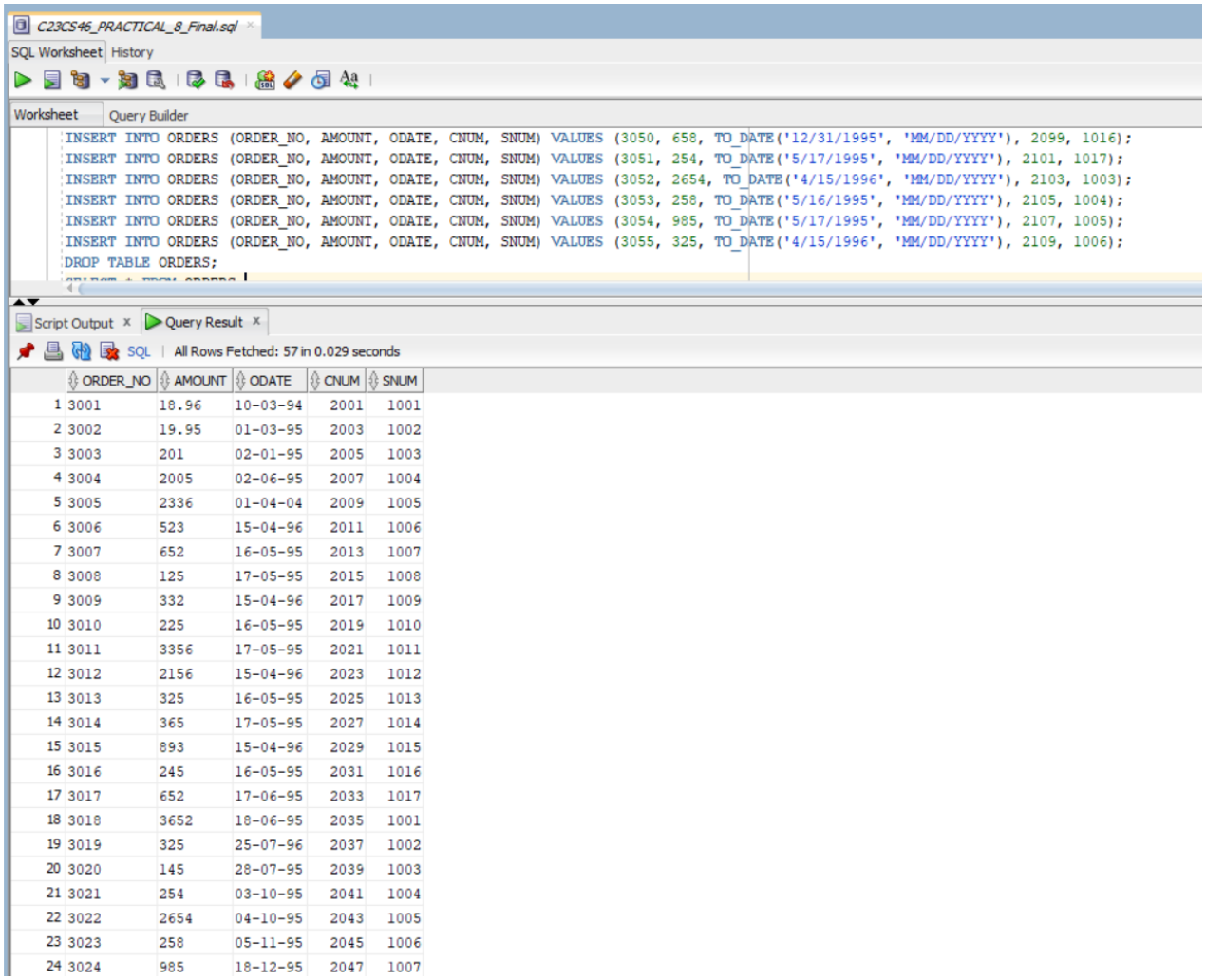
2. Test Cases:
   - Attempt to insert records with non-existent Cnum or Snum and ensure the system rejects them.



- Insert records with null Amount or Odate and ensure they are allowed.



- Retrieve all records from the Order table to verify data integrity.



```
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3050, 658, TO_DATE('12/31/1995', 'MM/DD/YYYY'), 2099, 1016);
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3051, 254, TO_DATE('5/17/1995', 'MM/DD/YYYY'), 2101, 1017);
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3052, 2654, TO_DATE('4/15/1996', 'MM/DD/YYYY'), 2103, 1003);
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3053, 258, TO_DATE('5/16/1995', 'MM/DD/YYYY'), 2105, 1004);
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3054, 985, TO_DATE('5/17/1995', 'MM/DD/YYYY'), 2107, 1005);
INSERT INTO ORDERS (ORDER_NO, AMOUNT, ODATE, CNUM, SNUM) VALUES (3055, 325, TO_DATE('4/15/1996', 'MM/DD/YYYY'), 2109, 1006);
DROP TABLE ORDERS;
```

All Rows Fetched: 57 in 0.029 seconds

	ORDER_NO	AMOUNT	ODATE	CNUM	SNUM
1	3001	18.96	10-03-94	2001	1001
2	3002	19.95	01-03-95	2003	1002
3	3003	201	02-01-95	2005	1003
4	3004	2005	02-06-95	2007	1004
5	3005	2336	01-04-04	2009	1005
6	3006	523	15-04-96	2011	1006
7	3007	652	16-05-95	2013	1007
8	3008	125	17-05-95	2015	1008
9	3009	332	15-04-96	2017	1009
10	3010	225	16-05-95	2019	1010
11	3011	3356	17-05-95	2021	1011
12	3012	2156	15-04-96	2023	1012
13	3013	325	16-05-95	2025	1013
14	3014	365	17-05-95	2027	1014
15	3015	893	15-04-96	2029	1015
16	3016	245	16-05-95	2031	1016
17	3017	652	17-06-95	2033	1017
18	3018	3652	18-06-95	2035	1001
19	3019	325	25-07-96	2037	1002
20	3020	145	28-07-95	2039	1003
21	3021	254	03-10-95	2041	1004
22	3022	2654	04-10-95	2043	1005
23	3023	258	05-11-95	2045	1006
24	3024	985	18-12-95	2047	1007

4. **Managing Sales Orders:** Sales orders track additional details such as delivery type and order status, with constraints to ensure consistency.

   Tasks:

   1. Create the Sales_order Table:

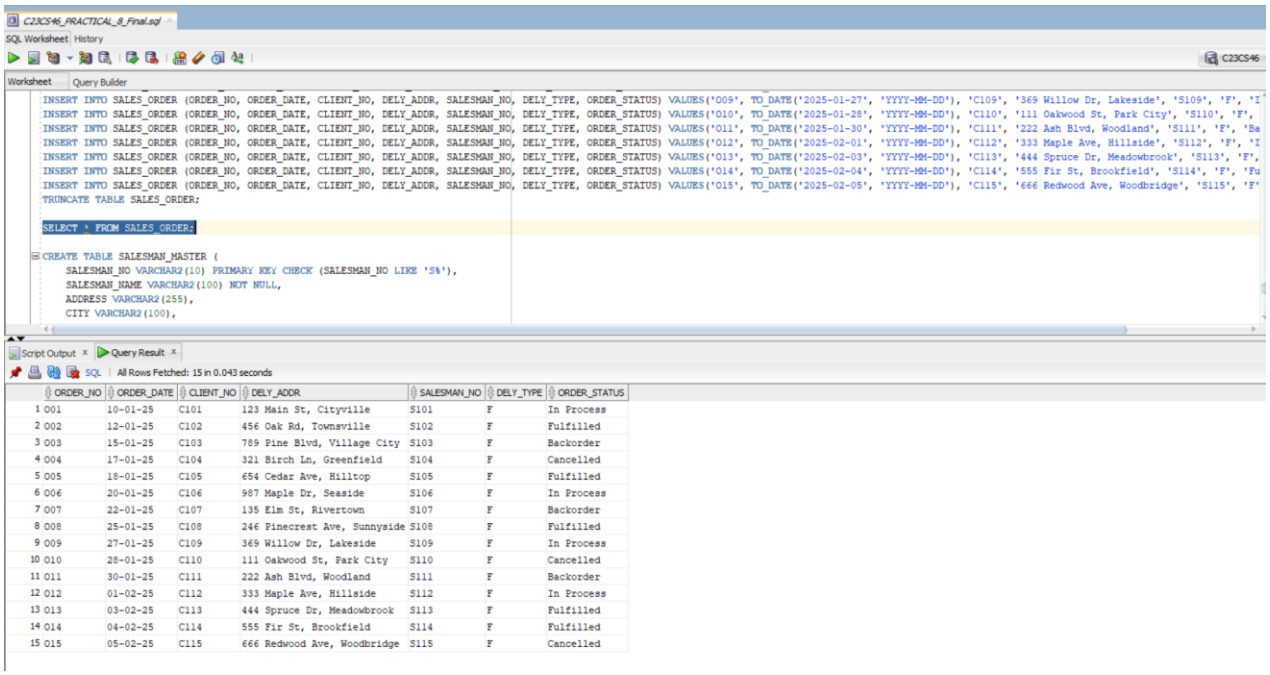
      Attributes:

      - Order_no: Order Number (Primary Key, first letter must start with ‘O’).
      - Order_date: Date of the Order.
      - Client_no: Client ID (Foreign Key references Client_master).
      - Dely_addr: Delivery Address.
      - Salesman_no: Salesperson ID (Foreign Key references Salesman_master).
      - Dely_type: Delivery Type (Default: ‘F’).
      - Order_status: Order Status (Allowed Values: In Process, Fulfilled, Backorder, Cancelled).

   Constraints:

      - Primary Key, Foreign Key, Check, and Default constraints.

2. Test Cases:
    - Verify that all constraints, including the primary key, check constraints, and default values, are applied correctly.



```
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O09', TO_DATE('2025-01-27', 'YYYY-MM-DD'), 'C109', '369 Willow Dr, Lakeside', 'S109', 'F', 'I
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O10', TO_DATE('2025-01-28', 'YYYY-MM-DD'), 'C110', '111 Oakwood St, Park City', 'S110', 'F',
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O11', TO_DATE('2025-01-30', 'YYYY-MM-DD'), 'C111', '222 Ash Blvd, Woodland', 'S111', 'F', 'Ba
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O12', TO_DATE('2025-02-01', 'YYYY-MM-DD'), 'C112', '333 Maple Ave, Hillside', 'S112', 'F', 'I
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O13', TO_DATE('2025-02-03', 'YYYY-MM-DD'), 'C113', '444 Spruce Dr, Meadowbrook', 'S113', 'F',
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O14', TO_DATE('2025-02-04', 'YYYY-MM-DD'), 'C114', '555 Fir St, Brookfield', 'S114', 'F', 'Fu
INSERT INTO SALES_ORDER (ORDER_NO, ORDER_DATE, CLIENT_NO, DELY_ADDR, SALESMAN_NO, DELY_TYPE, ORDER_STATUS) VALUES('O15', TO_DATE('2025-02-05', 'YYYY-MM-DD'), 'C115', '666 Redwood Ave, Woodbridge', 'S115', 'F'
TRUNCATE TABLE SALES_ORDER;

SELECT * FROM SALES_ORDER;

CREATE TABLE SALESMAN_MASTER (
    SALESMAN_NO VARCHAR2(10) PRIMARY KEY CHECK (SALESMAN_NO LIKE 'S%'),
    SALESMAN_NAME VARCHAR2(100) NOT NULL,
    ADDRESS VARCHAR2(255),
    CITY VARCHAR2(100),
```

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	ORDER_NO	ORDER_DATE	CLIENT_NO	DELY_ADDR	SALESMAN_NO	DELY_TYPE	ORDER_STATUS
1	O01	10-01-25	C101	123 Main St, Cityville	S101	F	In Process
2	O02	12-01-25	C102	456 Oak Rd, Townsville	S102	F	Fulfilled
3	O03	15-01-25	C103	789 Pine Blvd, Village City	S103	F	Backorder
4	O04	17-01-25	C104	321 Birch Ln, Greenfield	S104	F	Cancelled
5	O05	18-01-25	C105	654 Cedar Ave, Hilltop	S105	F	Fulfilled
6	O06	20-01-25	C106	987 Maple Dr, Seaside	S106	F	In Process
7	O07	22-01-25	C107	135 Elm St, Rivertown	S107	F	Backorder
8	O08	25-01-25	C108	246 Pinecrest Ave, Sunnyside	S108	F	Fulfilled
9	O09	27-01-25	C109	369 Willow Dr, Lakeside	S109	F	In Process
10	O10	28-01-25	C110	111 Oakwood St, Park City	S110	F	Cancelled
11	O11	30-01-25	C111	222 Ash Blvd, Woodland	S111	F	Backorder
12	O12	01-02-25	C112	333 Maple Ave, Hillside	S112	F	In Process
13	O13	03-02-25	C113	444 Spruce Dr, Meadowbrook	S113	F	Fulfilled
14	O14	04-02-25	C114	555 Fir St, Brookfield	S114	F	Fulfilled
15	O15	05-02-25	C115	666 Redwood Ave, Woodbridge	S115	F	Cancelled

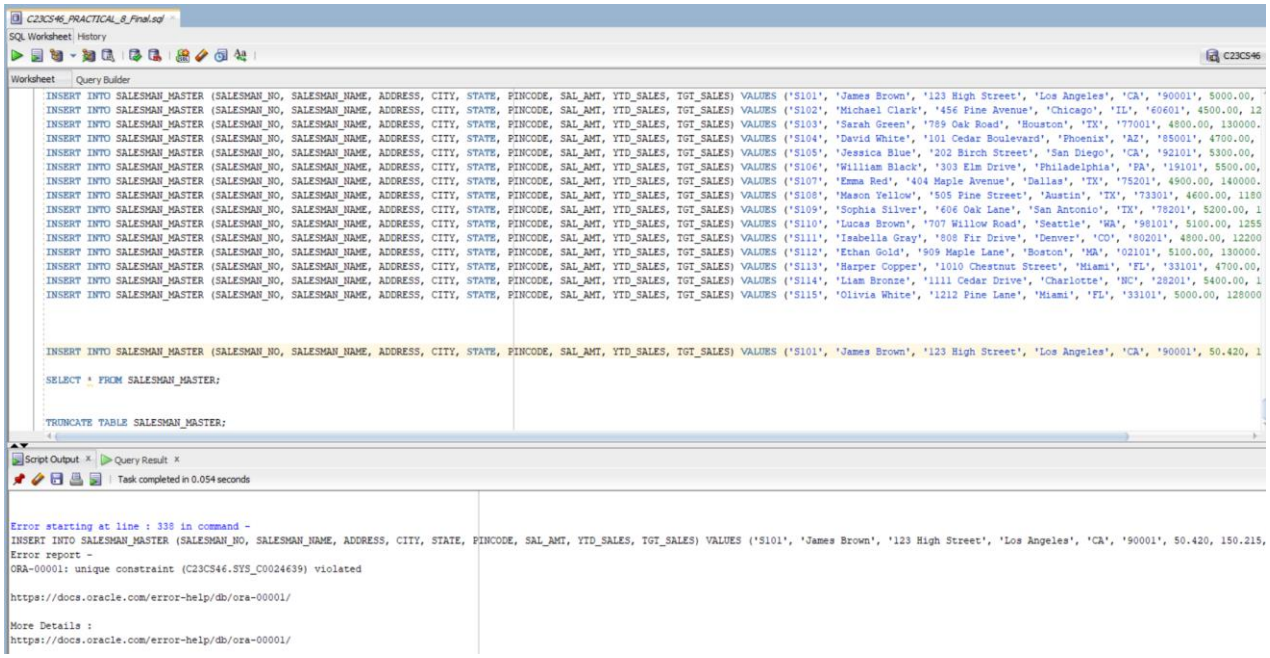
5. **Managing Salesman Details:** The organization needs to maintain records of salesmen, including their target and year-to-date sales, with strict constraints for validation.

Tasks:

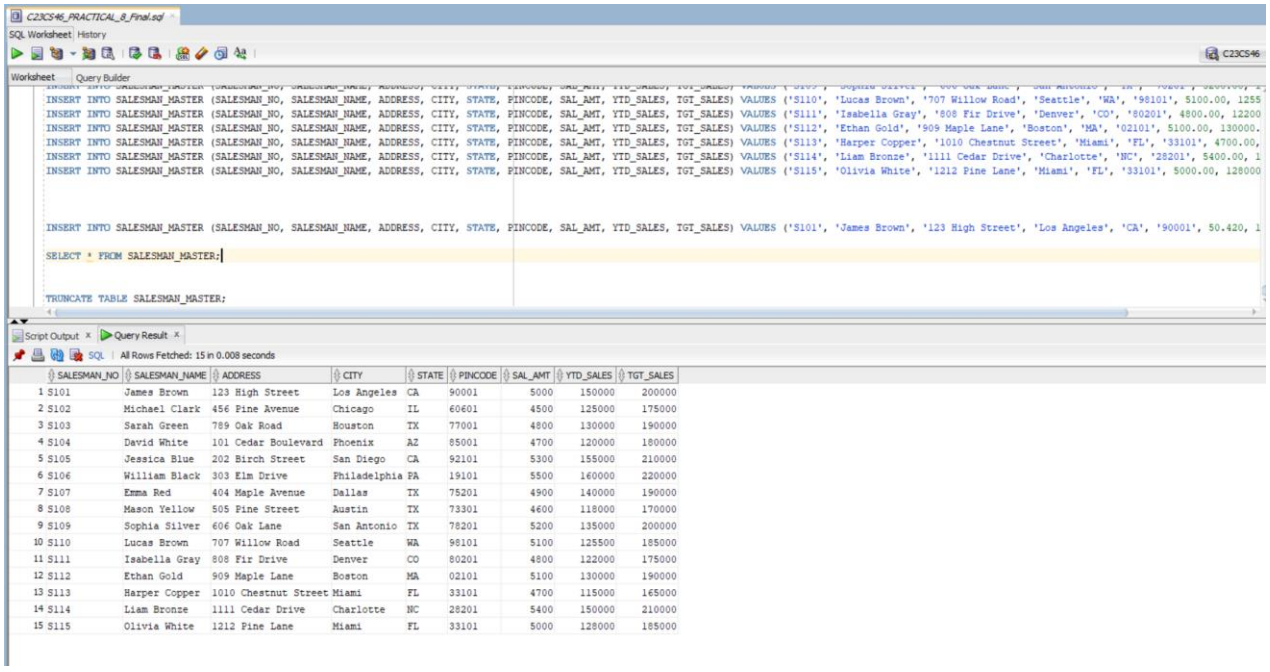
1. Create the Salesman_master Table:
   Attributes:
    - Salesman_no: Salesman Number (Primary Key, must start with ‘S’).
    - Salesman_name: Salesman Name (Not Null).
    - Address, City, Pincode, State: Additional details.
    - Sal_amt: Salary (Not Null, cannot be 0).
    - Ytd_sales: Year-to-date Sales (Not Null, cannot be 0).
    - Tgt_sales: Target Sales (Not Null).

2. Test Cases:

    - Verify that records with invalid Sal_amt or Ytd_sales are rejected.



- Ensure all constraints are correctly applied.



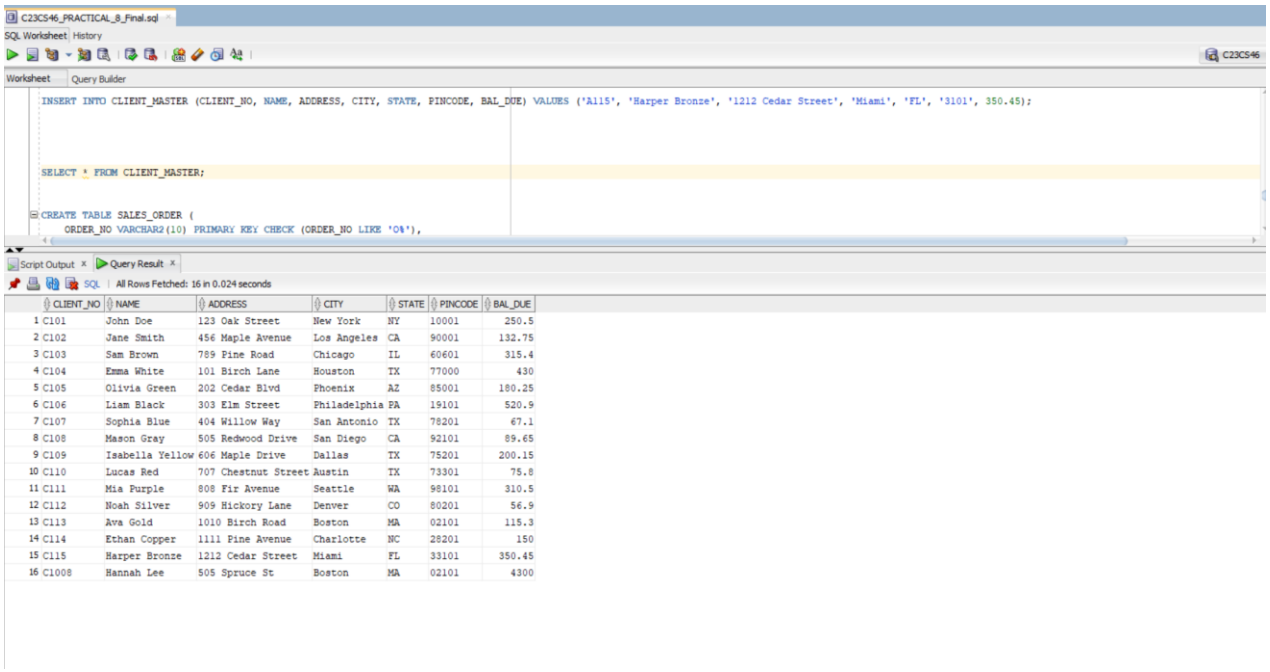
6. **Managing Client Details**: Clients are key stakeholders in the sales process. Their data must be consistent and adhere to specific constraints.

Tasks:

1. Create the Client_master Table:
   Attributes:
   - Client_no: Client Number (Primary Key, must start with ‘C’).
   - Name: Client Name (Not Null).
   - Address, City, State, Pincode: Client details.
   - Bal_due: Balance Due.

2. Test Cases:

- Verify that all constraints, including the primary key, not null, and check constraints, are correctly applied.



```
INSERT INTO CLIENT_MASTER (CLIENT_NO, NAME, ADDRESS, CITY, STATE, PINCODE, BAL_DUE) VALUES ('A115', 'Harper Bronze', '1212 Cedar Street', 'Miami', 'FL', '3101', 350.45);

SELECT * FROM CLIENT_MASTER;

CREATE TABLE SALES_ORDER (
    ORDER_NO VARCHAR2(10) PRIMARY KEY CHECK (ORDER_NO LIKE 'O%'),
```

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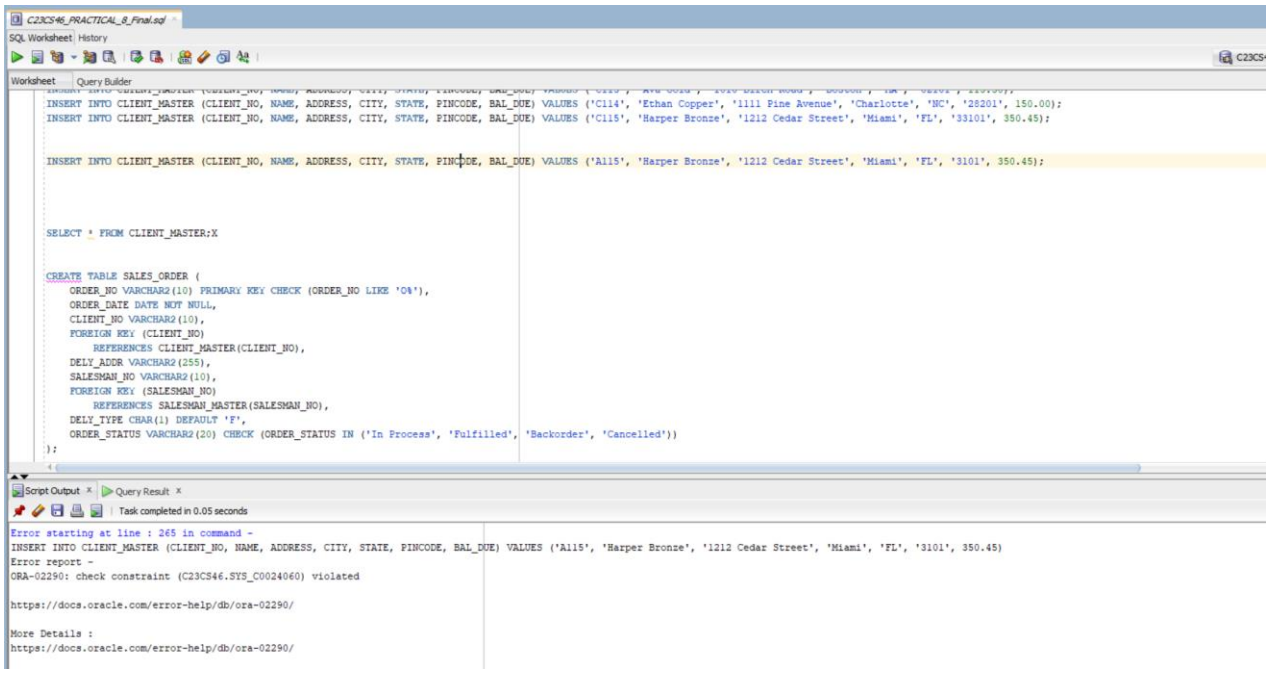
CLIENT_NO	NAME	ADDRESS	CITY	STATE	PINCODE	BAL_DUE
1 C101	John Doe	123 Oak Street	New York	NY	10001	250.5
2 C102	Jane Smith	456 Maple Avenue	Los Angeles	CA	90001	132.75
3 C103	Sam Brown	789 Pine Road	Chicago	IL	60601	315.4
4 C104	Emma White	101 Birch Lane	Houston	TX	77000	430
5 C105	Olivia Green	202 Cedar Blvd	Phoenix	AZ	85001	180.25
6 C106	Liam Black	303 Elm Street	Philadelphia	PA	19101	520.9
7 C107	Sophia Blue	404 Willow Way	San Antonio	TX	78201	67.1
8 C108	Mason Gray	505 Redwood Drive	San Diego	CA	92101	89.65
9 C109	Isabella Yellow	606 Maple Drive	Dallas	TX	75201	200.15
10 C110	Lucas Red	707 Chestnut Street	Austin	TX	73301	75.8
11 C111	Mia Purple	808 Fir Avenue	Seattle	WA	98101	310.5
12 C112	Noah Silver	909 Hickory Lane	Denver	CO	80201	56.9
13 C113	Ava Gold	1010 Birch Road	Boston	MA	02101	115.3
14 C114	Ethan Copper	1111 Pine Avenue	Charlotte	NC	28201	150
15 C115	Harper Bronze	1212 Cedar Street	Miami	FL	33101	350.45
16 C1008	Hannah Lee	505 Spruce St	Boston	MA	02101	4300

- Ensure invalid records are rejected.



```
INSERT INTO CLIENT_MASTER (CLIENT_NO, NAME, ADDRESS, CITY, STATE, PINCODE, BAL_DUE) VALUES ('C114', 'Ethan Copper', '1111 Pine Avenue', 'Charlotte', 'NC', '28201', 150.00);
INSERT INTO CLIENT_MASTER (CLIENT_NO, NAME, ADDRESS, CITY, STATE, PINCODE, BAL_DUE) VALUES ('C115', 'Harper Bronze', '1212 Cedar Street', 'Miami', 'FL', '33101', 350.45);

INSERT INTO CLIENT_MASTER (CLIENT_NO, NAME, ADDRESS, CITY, STATE, PINCODE, BAL_DUE) VALUES ('A115', 'Harper Bronze', '1212 Cedar Street', 'Miami', 'FL', '3101', 350.45);

SELECT * FROM CLIENT_MASTER;X

CREATE TABLE SALES_ORDER (
    ORDER_NO VARCHAR2(10) PRIMARY KEY CHECK (ORDER_NO LIKE 'O%'),
    ORDER_DATE DATE NOT NULL,
    CLIENT_NO VARCHAR2(10),
    FOREIGN KEY (CLIENT_NO)
        REFERENCES CLIENT_MASTER(CLIENT_NO),
    DELY_ADDR VARCHAR2(255),
    SALESMAN_NO VARCHAR2(10),
    FOREIGN KEY (SALESMAN_NO)
        REFERENCES SALESMAN_MASTER(SALESMAN_NO),
    DELY_TYPE CHAR(1) DEFAULT 'F',
    ORDER_STATUS VARCHAR2(20) CHECK (ORDER_STATUS IN ('In Process', 'Fulfilled', 'Backorder', 'Cancelled'))
);
```

Task completed in 0.05 seconds

```
Error starting at line : 265 in command -
INSERT INTO CLIENT_MASTER (CLIENT_NO, NAME, ADDRESS, CITY, STATE, PINCODE, BAL_DUE) VALUES ('A115', 'Harper Bronze', '1212 Cedar Street', 'Miami', 'FL', '3101', 350.45)
Error report -
ORA-02290: check constraint (C23CS46.SYS_C0024060) violated

https://docs.oracle.com/error-help/db/ora-02290/

More Details :
https://docs.oracle.com/error-help/db/ora-02290/
```