



## Faculty of Technology and Engineering

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**Department of Computer Science & Engineering**

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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)

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.

The image shows two screenshots of the SQL Developer interface. The top screenshot shows a script with four successful INSERT statements into the 'salespeople1' table. The bottom screenshot shows an attempt to insert a duplicate record, which results in an ORA-00001 error.

**Top Screenshot:**

```
8  -- Test Cases:
9  insert into salespeople1 values (1001, 'John', 'New York', 10);
10 insert into salespeople1 values (1002, 'Smith', 'London', 15);
11 insert into salespeople1 values (1003, 'Brown', 'Paris', 20);
12 insert into salespeople1 values (1004, 'Jones', 'Tokyo', 25);
13
```

Table SALESPEOPLE1 created.

1 row inserted.

1 row inserted.

1 row inserted.

1 row inserted.

Ln 12, Col 62 Spaces: 4 UTF-8 LF {} PL/SQL @ Go Live C23CS43

**Bottom Screenshot:**

```
14 -- o Insert a record with a duplicate Snum and ensure the system
15   rejects it.
16 insert into salespeople1 values (1001, 'John', 'New York', 10);
17
```

Error starting at line : 1 in command -  
insert into salespeople1 values (1001, 'John', 'New York', 10)  
Error report -  
ORA-00001: unique constraint (C23CS37.SYS\_C0024684) violated

<https://docs.oracle.com/error-help/db/ora-00001/>

More Details :  
<https://docs.oracle.com/error-help/db/ora-00001/>

Ln 15, Col 64 Spaces: 4 UTF-8 LF {} PL/SQL @ Go Live C23CS43

The image shows two screenshots of the SQL Developer interface. The top screenshot shows an SQL script with a comment and an insert statement that fails due to a NULL value in a column that does not accept NULLs. The bottom screenshot shows an SQL script with a comment and an insert statement that fails due to a unique constraint violation.

**Top Screenshot:**

```
16
17 -- o Attempt to insert a record with a null Sname and ensure it
    fails.
18 insert into salespeople1 values (1001, null, 'New York', 10);
```

PROBLEMS OUTPUT TERMINAL SCRIPT OUTPUT SQL HISTORY COMMENTS TASK MONITOR

Error starting at line : 1 in command -  
insert into salespeople1 values (1001, null, 'New York', 10)  
Error at Command Line : 1 Column : 40  
Error report -  
SQL Error: ORA-01400: cannot insert NULL into ("C23CS37"."SALESPEOPLE1"."SNAME")

[https://docs.oracle.com/error-help/db/ora-01400/01400. 00000 - "cannot insert NULL into \(%s\)"](https://docs.oracle.com/error-help/db/ora-01400/01400. 00000 - )  
\*Cause: An attempt was made to insert NULL into previously listed objects.  
\*Action: These objects cannot accept NULL values. Reservable columns cannot accept NULL values.

More Details :  
<https://docs.oracle.com/error-help/db/ora-01400/>

Ln 18, Col 62 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43

**Bottom Screenshot:**

```
19
20 -- o Insert a record with null City and Comm and ensure it is
    allowed.
21 insert into salespeople1 values (1001, 'John', null, null);
```

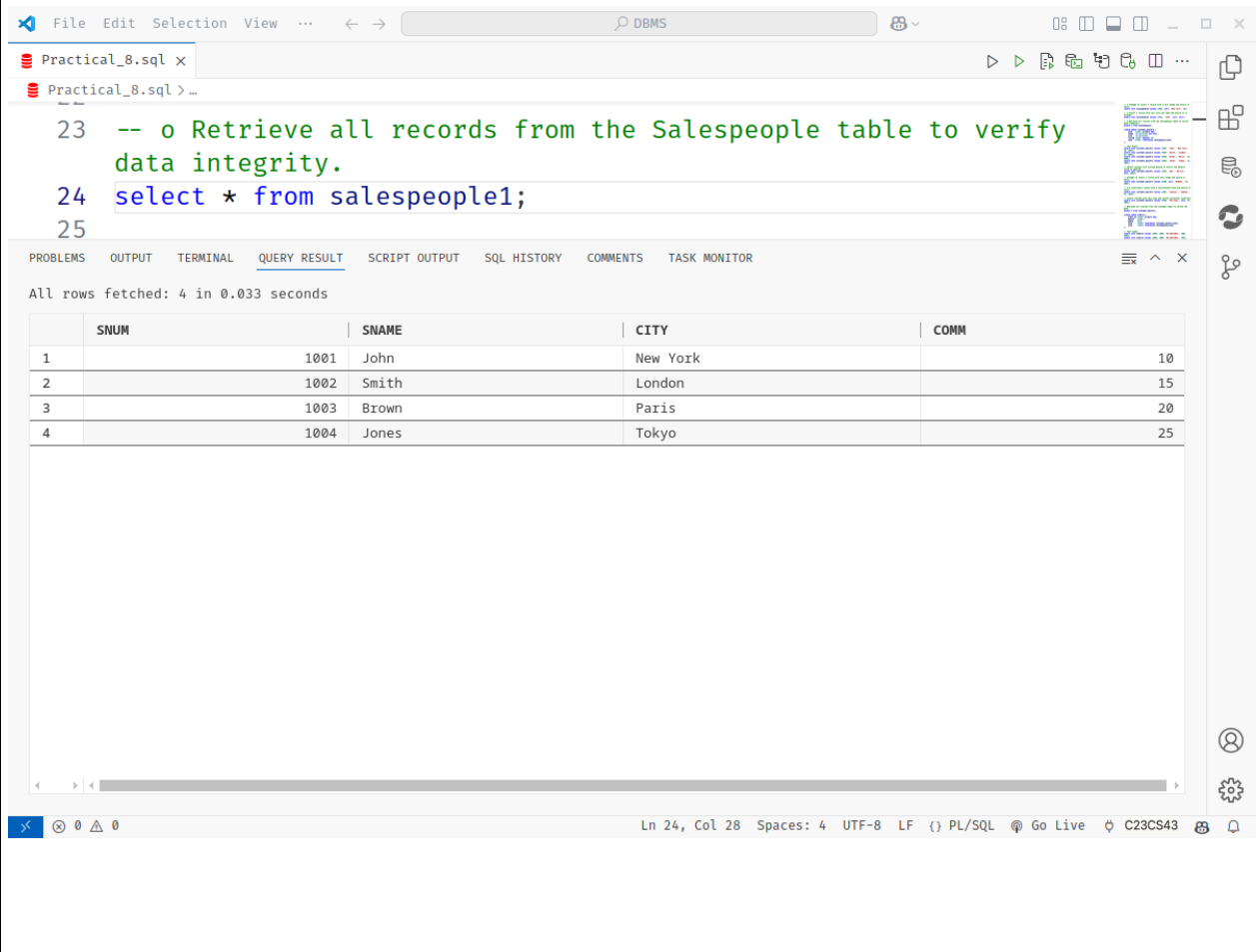
PROBLEMS OUTPUT TERMINAL SCRIPT OUTPUT SQL HISTORY COMMENTS TASK MONITOR

Error starting at line : 1 in command -  
insert into salespeople1 values (1001, 'John', null, null)  
Error report -  
ORA-00001: unique constraint (C23CS37.SYS\_C0024684) violated

<https://docs.oracle.com/error-help/db/ora-00001/>

More Details :  
<https://docs.oracle.com/error-help/db/ora-00001/>

Ln 21, Col 60 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43



The screenshot displays the Oracle SQL Developer environment. The top menu bar includes File, Edit, Selection, View, and a search bar labeled DBMS. The main editor window shows a SQL script with the following content:

```
23 -- o Retrieve all records from the Salespeople table to verify  
    data integrity.  
24 select * from salespeople1;  
25
```

Below the editor, the 'QUERY RESULT' tab is active, showing the execution of the query. The status bar indicates 'All rows fetched: 4 in 0.033 seconds'. The result is displayed in a table with the following columns: SNUM, SNAME, CITY, and COMM.

	SNUM	SNAME	CITY	COMM
1	1001	John	New York	10
2	1002	Smith	London	15
3	1003	Brown	Paris	20
4	1004	Jones	Tokyo	25

The bottom status bar shows the current cursor position: 'Ln 24, Col 28 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43'.

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.

The screenshot displays the SQL Developer interface with a script named 'Practical\_8.sql'. The script contains SQL commands to create a table and insert data. The 'SCRIPT OUTPUT' tab shows the execution results.

```
26 create table customer_master1 (  
32 );  
33  
34 -- Test Cases:  
35 insert into customer_master1 values (2001, 'John', 'New York',  
10, 1001);  
36 insert into customer_master1 values (2002, 'Smith', 'London',  
15, 1002);  
37 insert into customer_master1 values (2003, 'Brown', 'Paris', 20,  
1003);  
38 insert into customer_master1 values (2004, 'Jones', 'Tokyo', 25,  
1004);  
39
```

Table CUSTOMER\_MASTER1 created.

1 row inserted.

1 row inserted.

Ln 38, Col 72 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43

```
40 -- Insert records with missing Rating to ensure the default  
value is applied.  
41 insert into customer_master1 values (2005, 'Doe', 'Berlin',  
null, 1001);  
42
```

1 row inserted.

Ln 41, Col 73 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43

The screenshot displays two instances of the SQL Developer interface, each showing a different SQL query and its corresponding error message.

**Top Instance:**

- Query:**

```
42
43 -- Attempt to insert a record with null Cname and ensure it fails.
44 insert into customer_master1 values (2006, null, 'Mumbai', 10,
45 1002);
```
- Error Message:**

```
Error starting at line : 1 in command -
insert into customer_master1 values (2006, null, 'Mumbai', 10, 1002)
Error at Command Line : 1 Column : 44
Error report -
SQL Error: ORA-01400: cannot insert NULL into ("C23CS37"."CUSTOMER_MASTER1"."CNAME")

https://docs.oracle.com/error-help/db/ora-01400/01400. 00000 - "cannot insert NULL into (%s)"
*Cause:   An attempt was made to insert NULL into previously listed objects.
*Action:  These objects cannot accept NULL values. Reservable columns cannot
          accept NULL values.

More Details :
https://docs.oracle.com/error-help/db/ora-01400/
```

**Bottom Instance:**

- Query:**

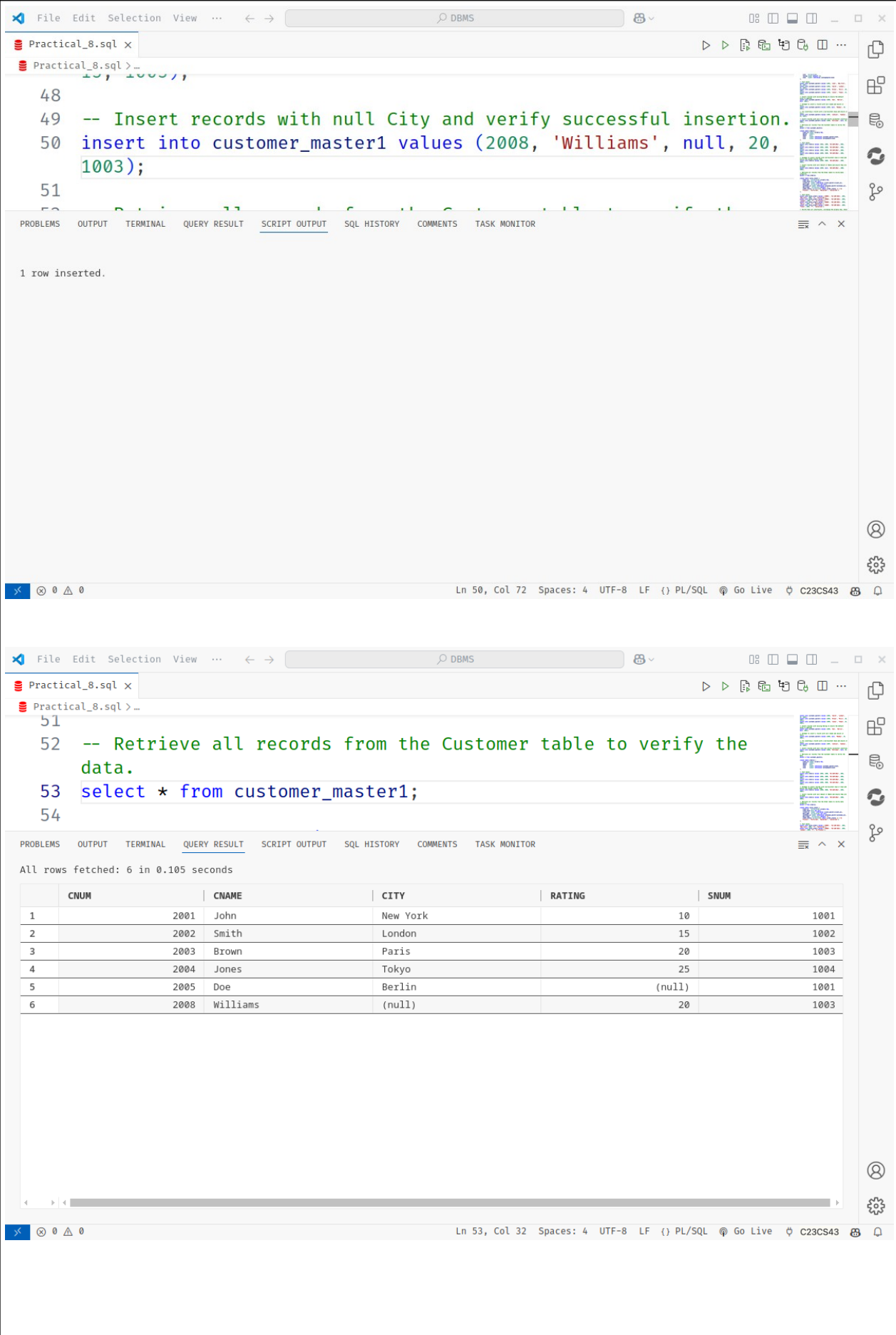
```
45
46 -- Try inserting a record with a non-existent Snum and ensure it fails.
47 insert into customer_master1 values (2007, 'Johnson', 'Sydney',
48 15, 1005);
```
- Error Message:**

```
Error starting at line : 1 in command -
insert into customer_master1 values (2007, 'Johnson', 'Sydney', 15, 1005)
Error report -
ORA-02291: integrity constraint (C23CS37.SYS_C0024687) violated - parent key not found

https://docs.oracle.com/error-help/db/ora-02291/

More Details :
https://docs.oracle.com/error-help/db/ora-02291/
```





The image displays two screenshots of the SQL Developer interface, showing a database session with a script named 'Practical\_8.sql'.

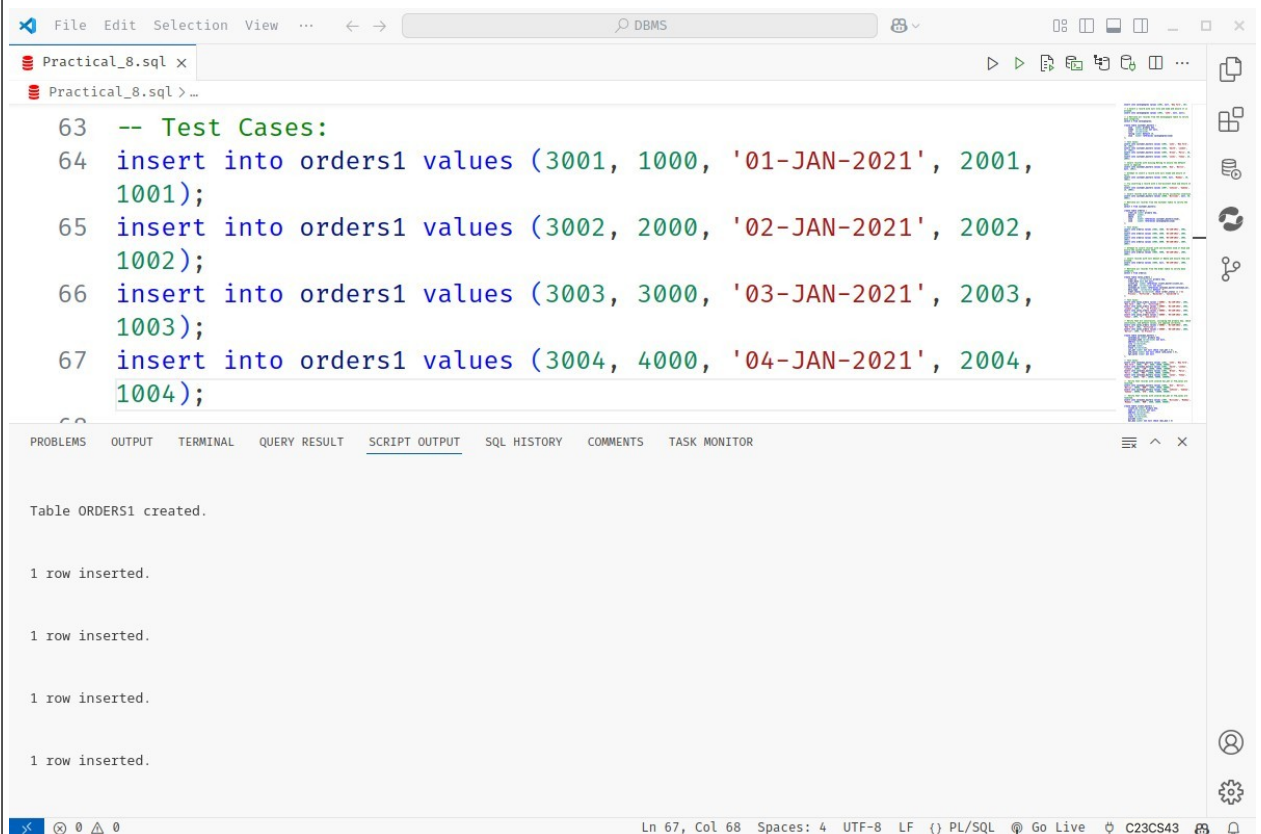
**Top Screenshot:** The script contains an SQL insert statement (lines 48-51) to add a new record to the 'customer\_master1' table. The statement is: `insert into customer_master1 values (2008, 'Williams', null, 20, 1003);`. The output pane shows '1 row inserted.'

**Bottom Screenshot:** The script contains an SQL select statement (lines 52-54) to retrieve all records from the 'customer\_master1' table. The statement is: `select * from customer_master1;`. The output pane shows 'All rows fetched: 6 in 0.105 seconds' and a table with 6 rows.

	CNUM	CNAME	CITY	RATING	SNUM
1	2001	John	New York	10	1001
2	2002	Smith	London	15	1002
3	2003	Brown	Paris	20	1003
4	2004	Jones	Tokyo	25	1004
5	2005	Doe	Berlin	(null)	1001
6	2008	Williams	(null)	20	1003

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 salespeople.



The screenshot shows the SQL Developer interface with a script named 'Practical\_8.sql'. The script contains four INSERT statements for the 'orders1' table. The 'SCRIPT OUTPUT' tab is active, displaying the results of each statement: 'Table ORDERS1 created.', '1 row inserted.', '1 row inserted.', '1 row inserted.', and '1 row inserted.'. The status bar at the bottom indicates the cursor is at line 67, column 68.

```
63 -- Test Cases:
64 insert into orders1 values (3001, 1000, '01-JAN-2021', 2001,
65 1001);
66 insert into orders1 values (3002, 2000, '02-JAN-2021', 2002,
67 1002);
68 insert into orders1 values (3003, 3000, '03-JAN-2021', 2003,
69 1003);
70 insert into orders1 values (3004, 4000, '04-JAN-2021', 2004,
71 1004);
```

Table ORDERS1 created.

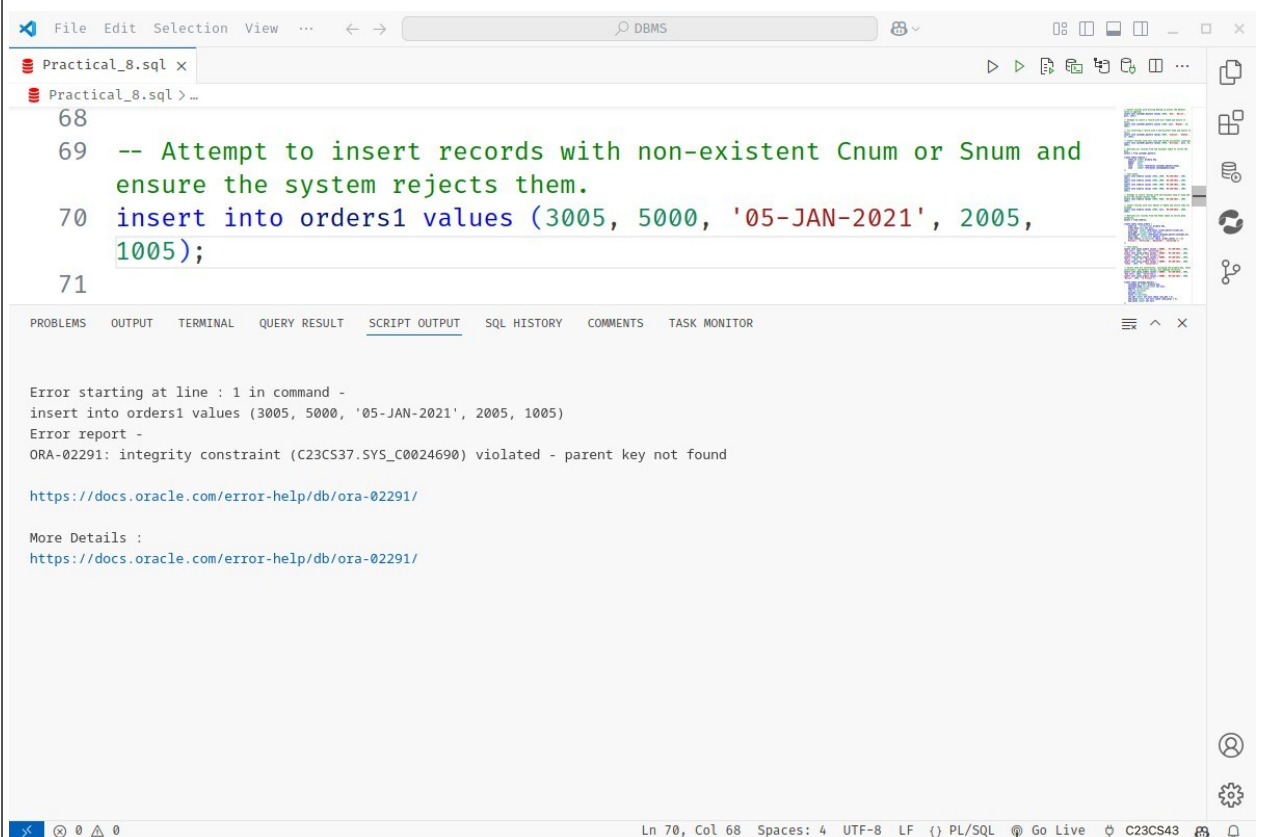
1 row inserted.

1 row inserted.

1 row inserted.

1 row inserted.

Ln 67, Col 68 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43



The screenshot shows the SQL Developer interface with the same script 'Practical\_8.sql'. The script is at line 70, and an error has occurred. The 'SCRIPT OUTPUT' tab displays the error message: 'Error starting at line : 1 in command - insert into orders1 values (3005, 5000, '05-JAN-2021', 2005, 1005) Error report - ORA-02291: integrity constraint (C23CS37.SYS\_C0024690) violated - parent key not found'. It also provides a link to the Oracle error documentation. The status bar at the bottom indicates the cursor is at line 70, column 68.

```
68
69 -- Attempt to insert records with non-existent Cnum or Snum and
70 ensure the system rejects them.
71 insert into orders1 values (3005, 5000, '05-JAN-2021', 2005,
72 1005);
```

Error starting at line : 1 in command -  
insert into orders1 values (3005, 5000, '05-JAN-2021', 2005, 1005)  
Error report -  
ORA-02291: integrity constraint (C23CS37.SYS\_C0024690) violated - parent key not found

<https://docs.oracle.com/error-help/db/ora-02291/>

More Details :  
<https://docs.oracle.com/error-help/db/ora-02291/>

Ln 70, Col 68 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43



The screenshot shows the SQL Developer interface with the 'Practical\_8.sql' file open. The editor displays the following SQL code:

```
71
72 -- Insert records with null Amount or Odate and ensure they are
   allowed.
73 insert into orders1 values (3007, 6000, null, 2004, 1004);
74
```

The 'SCRIPT OUTPUT' tab shows the result: '1 row inserted.'

---

The screenshot shows the SQL Developer interface with the 'Practical\_8.sql' file open. The editor displays the following SQL code:

```
75 -- Retrieve all records from the Order table to verify data
   integrity.
76 select * from orders1;
77
```

The 'QUERY RESULT' tab shows the result: 'All rows fetched: 5 in 0.142 seconds'.

	ORDER_NO	AMOUNT	ODATE	CNUM	SNUM
1	3001	1000	01/01/21		1001
2	3002	2000	02/01/21		1002
3	3003	3000	03/01/21		1003
4	3004	4000	04/01/21		1004
5	3007	6000	(null)		1004

#### 4. Managing Sales Orders: Sales orders track additional details such as delivery type

and order status, with constraints to ensure consistency.

The screenshot displays two instances of the Oracle SQL Developer interface. The top instance shows a successful SQL script execution. The bottom instance shows an error report for a failed SQL statement.

**Top SQL Script (Successful Execution):**

```
87
88 -- Test Cases:
89 insert into sales_order1 values ('S0001', '01-JAN-2021', 2001,
90 'New York', 1001, 'F', 'Fulfilled');
91 insert into sales_order1 values ('S0002', '02-JAN-2021', 2002,
92 'London', 1002, 'F', 'In Process');
93 insert into sales_order1 values ('S0003', '03-JAN-2021', 2003,
94 'Paris', 1003, 'F', 'Backorder');
95 insert into sales_order1 values ('S0004', '04-JAN-2021', 2004,
96 'Tokyo', 1004, 'F', 'Cancelled');
```

**Output:**

```
Table SALES_ORDER1 created.

1 row inserted.

1 row inserted.

1 row inserted.

1 row inserted
```

**Bottom SQL Script (Failed Execution):**

```
94 -- Verify that all constraints, including the primary key, check
95 constraints, and default values, are applied correctly.
96 insert into sales_order1 values ('S0001', '01-JAN-2021', 2001,
97 'New York', 1001, 'Fulfilled');
98 insert into sales_order1 values ('S0005', '05-JAN-2021', 2005,
99 'Berlin', 1005, 'In Process');
```

**Error Report:**

```
Error starting at line : 1 in command -
insert into sales_order1 values ('S0001', '01-JAN-2021', 2001, 'New York', 1001, 'Fulfilled')
Error at Command Line : 1 Column : 13
Error report -
SQL Error: ORA-00947: not enough values

https://docs.oracle.com/error-help/db/ora-00947/00947. 00000 - "not enough values"
*Cause: This error occurs when a SQL statement requires two
sets of values equal in number, but the second set contains
fewer items than the first set. This can occur in a WHERE or
HAVING clause in which a nested SELECT returns too few columns
as in:

More Details :
https://docs.oracle.com/error-help/db/ora-00947/

Error starting at line : 1 in command -
insert into sales_order1 values ('S0005', '05-JAN-2021', 2005, 'Berlin', 1005, 'In Process')
Error at Command Line : 1 Column : 13
```

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.

The screenshot displays the Oracle SQL Developer environment with two SQL scripts. The first script, 'Practical\_8.sql', contains four valid INSERT statements for the SALESMAN\_MASTER1 table. The second script, 'Practical\_8.sql', contains two INSERT statements with invalid values for SAL\_AMT and YTD\_SALES, which result in ORA-02290 errors.

**Script 1: Valid Inserts**

```
110 -- Test Cases:
111 insert into salesman_master1 values (1001, 'John', 'New York',
112 'New York', 10001, 'NY', 5000, 10000, 50000);
113 insert into salesman_master1 values (1002, 'Smith', 'London',
114 'London', 20002, 'LDN', 10000, 20000, 100000);
115 insert into salesman_master1 values (1003, 'Brown', 'Paris',
116 'Paris', 30003, 'PRS', 15000, 30000, 150000);
117 insert into salesman_master1 values (1004, 'Jones', 'Tokyo',
118 'Tokyo', 40004, 'TKY', 20000, 40000, 200000);
```

**Script 2: Invalid Inserts**

```
116 -- Verify that records with invalid Sal_amt or Ytd_sales are
117 rejected.
118 insert into salesman_master1 values (1005, 'Doe', 'Berlin',
119 'Berlin', 50005, 'BRN', -5000, 10000, 50000);
120 insert into salesman_master1 values (1006, 'Johnson', 'Sydney',
121 'Sydney', 60006, 'SYD', 5000, -10000, 50000);
```

**Output for Script 2:**

```
Error starting at line : 1 in command -
insert into salesman_master1 values (1005, 'Doe', 'Berlin', 'Berlin', 50005, 'BRN', -5000, 10000, 50000)
Error report -
ORA-02290: check constraint (C23CS37.SYS_C0024734) violated

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

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

Error starting at line : 2 in command -
insert into salesman_master1 values (1006, 'Johnson', 'Sydney', 'Sydney', 60006, 'SYD', 5000, -10000, 50000)
Error report -
ORA-02290: check constraint (C23CS37.SYS_C0024735) violated

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

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

```

120 -- Verify that records with invalid Sal_amt or Ytd_sales are
121 insert into salesman_master1 values (1007, 'Williams', 'Mumbai',
122 'Mumbai', 70007, 'MUM', 5000, -10000, 50000);

```

Error starting at line : 1 in command -  
 insert into salesman\_master1 values (1007, 'Williams', 'Mumbai', 'Mumbai', 70007, 'MUM', 5000, -10000, 50000)  
 Error report -  
 ORA-02290: check constraint (C23CS37.SYS\_C0024735) violated  
<https://docs.oracle.com/error-help/db/ora-02290/>  
 More Details :  
<https://docs.oracle.com/error-help/db/ora-02290/>

Ln 121, Col 111 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43

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

```

133 -- Test Cases:
134 insert into client_master1 values (2001, 'John', 'New York',
135 'New York', 'NY', 10001, 5000);
136 insert into client_master1 values (2002, 'Smith', 'London',
137 'London', 'LDN', 20002, 10000);
138 insert into client_master1 values (2003, 'Brown', 'Paris',
139 'Paris', 'PRS', 30003, 15000);
140 insert into client_master1 values (2004, 'Jones', 'Tokyo',
141 'Tokyo', 'TKY', 40004, 20000);

```

Table CLIENT\_MASTER1 created.  
 1 row inserted.  
 1 row inserted.  
 1 row inserted.  
 1 row inserted.

Ln 132, Col 1 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43



The image shows two screenshots of the SQL Developer interface. The top screenshot shows a SQL script with two INSERT statements. The first statement inserts a record with a primary key conflict, resulting in an ORA-02290 error. The second statement attempts to insert a NULL value into a NOT NULL column, resulting in an ORA-01400 error. The bottom screenshot shows a single INSERT statement that fails due to a unique constraint violation (ORA-00001).

**Top Screenshot:**

```
139 -- Verify that all constraints, including the primary key, not
140 insert into client_master1 values (2005, 'Doe', 'Berlin',
141 'Berlin', 'BRN', 50005, -5000);
142 insert into client_master1 values (2006, NULL, 'Sydney',
'Sydney', 'SYD', 60006, 5000);
```

PROBLEMS OUTPUT TERMINAL QUERY RESULT SCRIPT OUTPUT SQL HISTORY COMMENTS TASK MONITOR

Error starting at line : 1 in command -  
insert into client\_master1 values (2005, 'Doe', 'Berlin', 'Berlin', 'BRN', 50005, -5000)  
Error report -  
ORA-02290: check constraint (C23CS37.SYS\_C0024739) violated  
<https://docs.oracle.com/error-help/db/ora-02290/>  
More Details :  
<https://docs.oracle.com/error-help/db/ora-02290/>  
Error starting at line : 2 in command -  
insert into client\_master1 values (2006, NULL, 'Sydney', 'Sydney', 'SYD', 60006, 5000)  
Error at Command Line : 2 Column : 42  
Error report -  
SQL Error: ORA-01400: cannot insert NULL into ("C23CS37"."CLIENT\_MASTER1"."NAME")  
[https://docs.oracle.com/error-help/db/ora-01400/01400.00000- \"cannot insert NULL into \(%s\)\"](https://docs.oracle.com/error-help/db/ora-01400/01400.00000-\)

Ln 141, Col 88 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43

**Bottom Screenshot:**

```
143 -- Ensure invalid records are rejected.
144 insert into client_master1 values (2001, 'Williams', 'Mumbai',
145 'Mumbai', 'MUM', 70007, 5000);
```

PROBLEMS OUTPUT TERMINAL QUERY RESULT SCRIPT OUTPUT SQL HISTORY COMMENTS TASK MONITOR

1 row deleted.

Error starting at line : 1 in command -  
insert into client\_master1 values (2001, 'Williams', 'Mumbai', 'Mumbai', 'MUM', 70007, 5000)  
Error report -  
ORA-00001: unique constraint (C23CS37.SYS\_C0024740) violated  
<https://docs.oracle.com/error-help/db/ora-00001/>  
More Details :  
<https://docs.oracle.com/error-help/db/ora-00001/>

Ln 144, Col 94 Spaces: 4 UTF-8 LF {} PL/SQL Go Live C23CS43