Step 2 – Queries

Query 1:

```sql
-- Query 1: Select all attractions along with the total number of tickets contains each attraction
SELECT A.attraction_id, A.attraction_name, L.location_name, COUNT(Tickets.ticket_id) AS total_tickets
FROM ATTRACTIONS A
LEFT JOIN Tickets ON A.attraction_id = Tickets.attraction_id
JOIN LOCATIONS L on L.LOCATION_ID = A.LOCATION_ID
GROUP BY A.attraction_id, a.attraction_name, L.location_name
ORDER BY total_tickets DESC;
/*
   It uses a LEFT JOIN to ensure all attractions are included, even if they haven't included in any tickets.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.012 seconds

	ATTRACTION_ID	ATTRACTION_NAM	LOCATION_NAME	TOTAL_TICKETS
1	1	Observation Deck	Webster Groves	5
2	272	Amusement Park	Hong Kong	5
3	109	Water Park	Lummen	4
4	329	Amusement Park	Goiania	4
5	124	Amusement Park	Udine	4

Query 2:

```sql
-- Query 2: Find tickets of attractions located in both 'Delaware' and 'UT'
select distinct A2.attraction_name, category_name, A2.opening_hours, location_name, area_name
from (
SELECT attraction_name, opening_hours, category_name
FROM tickets T
join Attractions A ON T.attraction_id = A.attraction_id
join categories C ON C.category_id = T.category_id
WHERE location_id IN (
    SELECT location_id
    FROM Locations
    WHERE area_id in (SELECT area_id FROM Areas WHERE area_name = 'Delaware')
)
INTERSECT
SELECT attraction_name, opening_hours, category_name
FROM tickets T
join Attractions A ON T.attraction_id = A.attraction_id
join categories C ON C.category_id = T.category_id
WHERE location_id IN (
    SELECT location_id
    FROM Locations
    WHERE area_id in (SELECT area_id FROM Areas WHERE area_name = 'UT' )
)) A1
JOIN Attractions A2 ON A1.attraction_name = A2.attraction_name
join LOCATIONS L ON L.location_id = A2.location_id
join Areas A ON A.area_id = L.area_id
where area_name in ('UT', 'Delaware')
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.04 seconds

	ATTRACTION_NAM	CATEGORY_NAME	OPENING_HOURS	LOCATION_NAME	AREA_NAME
1	Museum	Child	24/7	Marlboro	Delaware
2	Museum	Child	24/7	Calgary	UT
3	Museum	Child	24/7	Eisenhüttenstadt	Delaware
4	Museum	Teenager	24/7	Calgary	UT
5	Museum	Teenager	24/7	Eisenhüttenstadt	Delaware
6	Golden Gate Bridge	Teenager	24/7	Antwerpen	UT

Query 3:

```sql
-- Query 3: Select all orders placed on or after 2024-01-01, along with the customer name and total order amount
SELECT c.customer_name, o.order_id, o.order_date, SUM(t.price) AS total_order_amount
FROM Orders o
INNER JOIN Customers c ON o.customer_id = c.customer_id
INNER JOIN Order_Items oi ON o.order_id = oi.order_id
INNER JOIN Tickets t ON oi.ticket_id = t.ticket_id
WHERE o.order_date >= TO_DATE('2024-01-01', 'YYYY-MM-DD')
GROUP BY c.customer_name, o.order_id, o.order_date
ORDER BY total_order_amount DESC;

/*
  This query selects all orders placed on or after a specific date, along with the customer name and total order amount.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.075 seconds

	CUSTOMER_NAME	ORDER_ID	ORDER_DATE	TOTAL_ORDER_AMOUNT
1	Gloriane Boscher	180	2/24/2024, 12:00:00 AM	254
2	Reggi Wickes	162	5/12/2024, 12:00:00 AM	133
3	Bobina Hindsberg	388	2/29/2024, 12:00:00 AM	122
4	Tybie Ianni	253	1/26/2024, 12:00:00 AM	74
5	Burlie Scambler	201	5/9/2024, 12:00:00 AM	62

Query 4:

```sql
-- Query 4: Select all attractions that have not included by any tickets yet
SELECT A.Attraction_Id, A.attraction_name, location_name, area_name
FROM Attractions A
JOIN Locations L ON A.location_id = L.location_id
JOIN AREAS AR ON AR.area_id = L.area_id
LEFT JOIN Tickets T ON A.attraction_id = T.attraction_id
WHERE T.ticket_id IS NULL;

/*
   It utilizes a LEFT JOIN to include attractions that haven't included by any tickets.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.088 seconds

	ATTRACTION_ID	ATTRACTION_NAM	LOCATION_NAME	AREA_NAME
1	22	Botanical Garden	Aberdeen	VT
2	231	National Park	Bismarck	DE
3	327	Adventure Park	Bergen	Wyoming
4	337	Adventure Park	Traralgon	Oregon
5	49	National Park	New Fairfield	Kansas

Query 5 – Before update:

```sql
-- Query 5: Update the opening hours of all the Botanical Garden attractions
-- BEFORE UPDATE
select * from Attractions
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Botanical Garden'
);

/*
   It uses a subquery to find the attraction_id based on the attraction name.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.01 seconds

	ATTRACTION_ID	ATTRACTION_NAM	DESCRIPTION	OPENING_HOURS	LOCATION_ID
1	313	Botanical Garden	313B Black 300W P4	8:00 AM - 5:00 PM	164
2	320	Botanical Garden	Biostar M6TSU M/B(	11:30 AM - 8:30 PM	377
3	353	Botanical Garden	Antec Plus 660 ATX	9:30 AM - 6:30 PM	255
4	369	Botanical Garden	Combo Intel P4 1.9G	8:00 AM - 5:00 PM	327
5	376	Botanical Garden	AMD XP 1800+ & Gi	9:30 AM - 7:30 PM	383

Query 5 – Update:

```sql
-- Query 5: Update the opening hours of all the Botanical Garden attractions
UPDATE Attractions
SET opening_hours = '09:00 AM - 06:00 PM'
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Botanical Garden'
);

/*
   It uses a subquery to find the attraction_id based on the attraction name.
*/
```

Query 5 – After update:

```
22 rows updated.

Elapsed: 00:00:00.016
```

```sql
-- Query 5: Update the opening hours of all the Botanical Garden attractions
-- AFTER UPDATE
select * from Attractions
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Botanical Garden'
);

/*
  It uses a subquery to find the attraction_id based on the attraction name.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.003 seconds

	ATTRACTION_ID	ATTRACTION_NAM	DESCRIPTION	OPENING_HOURS	LOCATION_ID
1	313	Botanical Garden	313B Black 300W P4/AMD Fan&US	09:00 AM - 06:00 PM	164
2	320	Botanical Garden	Biostar M6TSU M/B(30 day D.O.A V	09:00 AM - 06:00 PM	377
3	353	Botanical Garden	Antec Plus 660 ATX Mid tower 330	09:00 AM - 06:00 PM	255
4	369	Botanical Garden	Combo Intel P4 1.9Ghz (Box CPU)+	09:00 AM - 06:00 PM	327
5	376	Botanical Garden	AMD XP 1800+ & Gigabyte GA-7VK	09:00 AM - 06:00 PM	383
6	377	Botanical Garden	Combo Intel Celeron 1.8Ghz (Box C	09:00 AM - 06:00 PM	369

Query 6 – Before update:

```sql
-- Query 6: Update the price of all tickets for attractions located in the Delaware area and classified into teanager category
-- BEFORE UPDATE.
select * from tickets t
WHERE t.category_id = (
    SELECT c.category_id
    FROM Categories c
    WHERE c.category_name = 'Teenager'
)
AND t.attraction_id IN (
    SELECT a.attraction_id
    FROM Attractions a
    JOIN Locations l ON a.location_id = l.location_id
    JOIN Areas ar ON l.area_id = ar.area_id
    WHERE ar.area_name = 'Delaware'
);
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.002 seconds

	TICKET_ID	PRICE	VALID_FROM	VALID_UNTIL	CATEGORY_ID	ATTRACTION_ID
1	402	55	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	401
2	406	55	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	404
3	410	55	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	412
4	411	55	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	413

Query 6 – Update:

```sql
-- Query 6: Update the price of all tickets for attractions located in the Delaware area and classified into teanager category
-- BEFORE UPDATE.
UPDATE Tickets t
SET t.price = t.price * 1.10
WHERE t.category_id = (
    SELECT c.category_id
    FROM Categories c
    WHERE c.category_name = 'Teenager'
)
AND t.attraction_id IN (
    SELECT a.attraction_id
    FROM Attractions a
    JOIN Locations l ON a.location_id = l.location_id
    JOIN Areas ar ON l.area_id = ar.area_id
    WHERE ar.area_name = 'Delaware'
);
```

```
4 rows updated.

Elapsed: 00:00:00.019
```

Query 6 – After update:

```sql
-- Query 6: Update the price of all tickets for attractions located in the Delaware area and classified into teanager category
-- AFTER UPDATE.
select * from tickets t
WHERE t.category_id = (
    SELECT c.category_id
    FROM Categories c
    WHERE c.category_name = 'Teenager'
)
AND t.attraction_id IN (
    SELECT a.attraction_id
    FROM Attractions a
    JOIN Locations l ON a.location_id = l.location_id
    JOIN Areas ar ON l.area_id = ar.area_id
    WHERE ar.area_name = 'Delaware'
);
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.005 seconds

	TICKET_ID	PRICE	VALID_FROM	VALID_UNTIL	CATEGORY_ID	ATTRACTION_ID
1	402	60.5	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	401
2	406	60.5	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	404
3	410	60.5	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	412
4	411	60.5	7/1/2024, 12:00:00 A	12/31/2024, 12:00:0(	2	413

Query 7 – Before delete:

```sql
-- Query 7: Find and sort desc orders history by customer id and delete all orders from earlier than the third order date
-- In other words, delete order history and keep only the last three orders
-- BEFORE UPDATE - count how many old orders exists
select o.customer_id, count(*) as  count_orders
from orders o
where order_date = (
    select order_date
    from (
        SELECT customer_id, order_date, ROW_NUMBER() OVER (PARTITION BY customer_id ORDER BY order_date DESC) AS rn
    FROM orders)
    where rn = 3 and customer_id = o.customer_id)
group by o.customer_id
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.003 seconds

	CUSTOMER_ID	COUNT_ORDERS
1	774	2
2	655	1
3	665	2
4	668	4
5	796	1

Query 7 – Customer 774 before delete:

```sql
select * from orders where customer_id = 774 order by order_date desc
```

Query Result | Script Output | DBMS Output | Explain Plan | Autot Resize | SQL History

Download ▾ Execution time: 0.009 seconds

	ORDER_ID	ORDER_DATE	CUSTOMER_ID
1	404	5/2/2024, 12:00:00 AM	774
2	402	5/2/2024, 12:00:00 AM	774
3	403	5/1/2024, 12:00:00 AM	774
4	401	5/1/2024, 12:00:00 AM	774
5	292	5/30/2018, 12:00:00 AM	774
6	101	3/30/2016, 12:00:00 AM	774
7	136	7/26/2012, 12:00:00 AM	774

Query 7 – Delete order items before deleting orders:

```sql
-- delete order items
delete from ORDER_ITEMS where order_id in (
WITH ThirdOrderDates AS (
    SELECT customer_id, order_date AS third_order_date
    FROM (
        SELECT customer_id, order_date, ROW_NUMBER() OVER (PARTITION BY customer_id ORDER BY order_date DESC) AS rn
        FROM orders
    )
    WHERE rn = 3
)

select order_id FROM orders
WHERE (customer_id, order_date) IN (
    SELECT o.customer_id, o.order_date
    FROM orders o
    JOIN ThirdOrderDates t ON o.customer_id = t.customer_id
    WHERE o.order_date < t.third_order_date
))
```

Query 7 – Delete:

```sql
-- Query 7: Find and sort desc orders history by customer id and delete all orders from earlier than the third order date
-- In other words, delete order history and keep only orders from last three dates
delete from orders where order_id in (
WITH ThirdOrderDates AS (
    SELECT customer_id, order_date AS third_order_date
    FROM (
        SELECT customer_id, order_date, ROW_NUMBER() OVER (PARTITION BY customer_id ORDER BY order_date DESC) AS rn
        FROM orders
    )
    WHERE rn = 3
)

SELECT * FROM orders
WHERE (customer_id, order_date) IN (
    SELECT o.customer_id, o.order_date
    FROM orders o
    JOIN ThirdOrderDates t ON o.customer_id = t.customer_id
    WHERE o.order_date < t.third_order_date
));

```

Query 7 – After delete:

```sql
-- AFTER UPDATE - count how many old orders exists
WITH ThirdOrderDates AS (
    SELECT customer_id, order_date AS third_order_date
    FROM (
        SELECT customer_id, order_date, ROW_NUMBER() OVER (PARTITION BY customer_id ORDER BY order_date DESC) AS rn
        FROM orders
    )
    WHERE rn = 3
)

SELECT * FROM orders
WHERE (customer_id, order_date) IN (
    SELECT o.customer_id, o.order_date
    FROM orders o
    JOIN ThirdOrderDates t ON o.customer_id = t.customer_id
    WHERE o.order_date < t.third_order_date
)

```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.033 seconds

ORDER_ID	ORDER_DATE	CUSTOMER_ID
No data found		

Query 7 – Customer 774 after delete:

```sql
select * from orders where customer_id = 774 order by order_date desc
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.002 seconds

	ORDER_ID	ORDER_DATE	CUSTOMER_ID
1	402	5/2/2024, 12:00:00 AM	774
2	404	5/2/2024, 12:00:00 AM	774
3	401	5/1/2024, 12:00:00 AM	774
4	403	5/1/2024, 12:00:00 AM	774

Query 7 – Table after delete:

```sql
WITH ThirdOrderDates AS (
    SELECT customer_id, order_date AS third_order_date
    FROM (
        SELECT customer_id, order_date, ROW_NUMBER() OVER (PARTITION BY customer_id ORDER BY order_date DESC) AS rn
        FROM orders
    )
    WHERE rn = 3
)

select count(order_id) FROM orders
WHERE (customer_id, order_date) IN (
    SELECT o.customer_id, o.order_date
    FROM orders o
    JOIN ThirdOrderDates t ON o.customer_id = t.customer_id
    WHERE o.order_date < t.third_order_date
);
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.021 seconds

	COUNT(ORDER_ID)
1	0

Query 8 – Before delete:

```sql
-- Query 8: Delete all tickets for a specific attraction
--BEFORE DELETE
select * FROM Tickets
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Golden Gate Bridge'
);

/*
   This query deletes all tickets for Golden Gate Bridge attraction.
   It uses a subquery to find the attraction_id based on the attraction name.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.013 seconds

	TICKET_ID	PRICE	VALID_FROM	VALID_UNTIL	CATEGORY_ID	ATTRACTION_ID
1	600	50	6/1/2024, 12:00:00 AM	12/31/2024, 12:00:0(	1	401
2	405	55	7/1/2024, 12:00:00 AM	12/31/2024, 12:00:0(	2	409
3	401	50	6/1/2024, 12:00:00 AM	12/31/2024, 12:00:0(	1	401
4	402	60.5	7/1/2024, 12:00:00 AM	12/31/2024, 12:00:0(	2	401

Query 8 – Delete:

```sql
-- Query 8: Delete all tickets for a specific attraction
--BEFORE DELETE
DELETE FROM Tickets
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Golden Gate Bridge'
);

/*
   This query deletes all tickets for Golden Gate Bridge attraction.
   It uses a subquery to find the attraction_id based on the attraction name.
*/
```

```
4 rows deleted.

Elapsed: 00:00:00.012
```

Query 8 – Table after delete:

```sql
-- Query 8: Delete all tickets for a specific attraction
--AFTER DELETE
select * FROM Tickets
WHERE attraction_id in (
    SELECT attraction_id
    FROM Attractions
    WHERE attraction_name = 'Golden Gate Bridge'
);

/*
   This query deletes all tickets for Golden Gate Bridge attraction.
   It uses a subquery to find the attraction_id based on the attraction name.
*/
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download | Execution time: 0.003 seconds

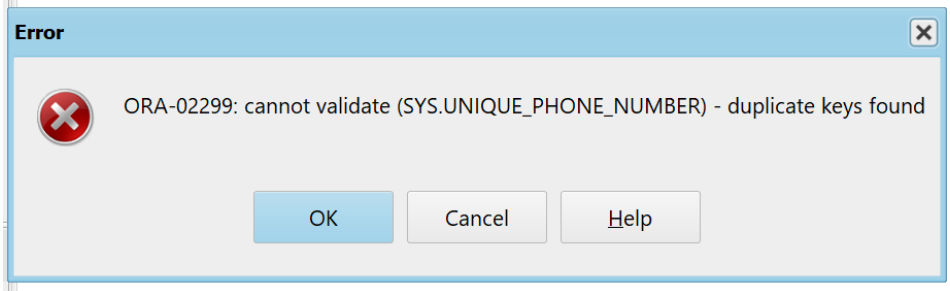
TICKET_ID	PRICE	VALID_FROM	VALID_UNTIL	CATEGORY_ID	ATTRACTION_ID
No data found					

Constraints:

Constraint 1:

Trying to add the constraint

```
-- Add constraint to Customers table for phone number uniqueness
ALTER TABLE Customers
ADD CONSTRAINT unique_phone_number UNIQUE (phone_numer);
```



Add new phone number field and copy the data

```
ALTER TABLE Customers
ADD phone_number VARCHAR2(10);

update customers
set phone_number = phone_numer
where phone_numer in (
select phone_numer from (
SELECT phone_numer, COUNT(*)
FROM Customers
GROUP BY phone_numer
HAVING COUNT(*) > 1))
```

Validate the data has been copied

```
select * from customers
```

	CUSTOMER_ID	CUSTOMER_NAME	PHONE_NUMER	ADDRESS_LINE_1	ADDRESS_LINE_2	PHONE_NUMBER
1	1	Dorey Nacey	1234567890	83 Clyde Gallagher Crossing	Suite 21	
2	2	Rhodie Dainty	6242738669	747 Warbler Center	Suite 52	6242738669
3	3	Jobey Abrahm	4734466220	21701 Sheridan Court	Suite 6	4734466220
4	4	Ryley Trobridge	2785068828	05 Hayes Center	Apt 1357	2785068828
5	5	Elbertina Farrah	6706256225	26 Monica Lane	Suite 27	6706256225

Delete duplicates before adding the constraint

```
SELECT phone_number, COUNT(*)
FROM Customers
GROUP BY phone_number
HAVING COUNT(*) > 1;

DELETE FROM Order_Items
WHERE order_id IN (
  SELECT order_id
  FROM Orders
  WHERE customer_id IN (
    SELECT customer_id
    FROM Customers
    WHERE phone_number IN (
      SELECT phone_number
      FROM Customers
      GROUP BY phone_number
      HAVING COUNT(*) > 1
    )
  )
);

DELETE FROM Orders
WHERE customer_id IN (
  SELECT customer_id
  FROM Customers
  WHERE phone_number IN (
    SELECT phone_number
    FROM Customers
    GROUP BY phone_number
    HAVING COUNT(*) > 1
  )
);

-- Delete duplicate records, keeping only the first occurrence
DELETE FROM Customers
WHERE ROWID NOT IN (
  SELECT MIN(ROWID)
  FROM Customers
  GROUP BY phone_number
);
```

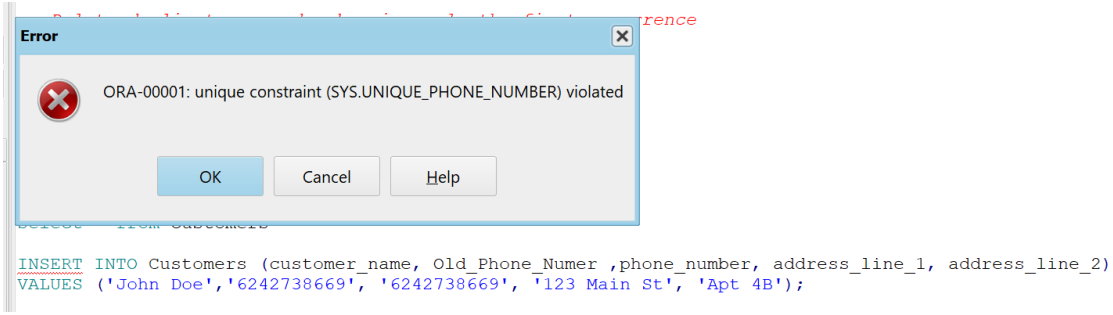
Rename old field

```
ALTER TABLE Customers
RENAME COLUMN phone_numer TO old_phone_numer;
```

Adding the constraint

```
-- Add constraint to Customers table for enshuring phone_number is unique
ALTER TABLE Customers
ADD CONSTRAINT unique_phone_number UNIQUE (phone_number);
```

Attempt to insert invalid data




```
INSERT INTO Customers (customer_name, Old_Phone_Numer ,phone_number, address_line_1, address_line_2)
VALUES ('John Doe','6242738669', '6242738669', '123 Main St', 'Apt 4B');
```

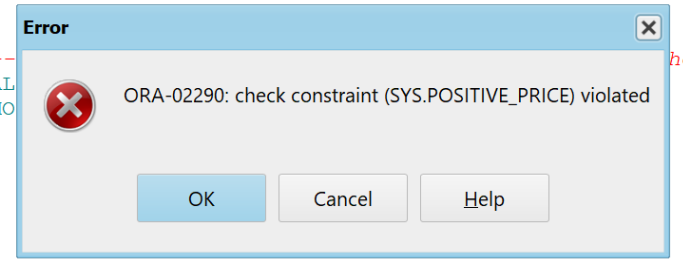
Constraint 2:

Adding the constraint

```
-- Add constraint to Tickets table for ensuring price is greater than zero
ALTER TABLE Tickets
ADD CONSTRAINT positive_price CHECK (price > 0);
```

Attempt to insert invalid data

```
-- Attempt to insert a ticket with an invalid price
INSERT INTO Tickets (price, valid_from, valid_until, category_id, attraction_id)
VALUES (-50, SYSDATE, SYSDATE + 30, 1, 401);
```



Constraint 3:

```
-- Add constraint to Orders table for settig default order_date to sysdate
ALTER TABLE Orders
MODIFY order_date DEFAULT SYSDATE;
```

Attempt to insert the a line without the new default key

```
-- Attempt to insert an order without an order_date
INSERT INTO Orders (customer_id)
VALUES (1);

select * from Orders
```

19:1 [101] binac@XE AS SYSDBA [00:57:45] 1 row inserted in 0.001 seconds