

1. Purchasing date (ORDER_DATE) of a customer must be greater than or equal to the registration date (REG_DATE). Write a trigger to:
 - a. Insert data into ORDERS table.
 - b. Update order_date or cust_id of ORDERS table.
 - c. Update reg_date of CUSTOMERS table.
2. TOTAL_ORDER of a customer must be equal to the sum of TOTAL of all order of this customer. Write a trigger to:
 - a. Insert data into orders table.
 - b. Delete data from orders table.
 - c. Update data from orders table.

1. Purchasing date (ORDER_DATE) of a customer must be greater than or equal to the registration date (REG_DATE)
 - a. Insert data into ORDERS table.
 - TRIGGER trên một dòng dữ liệu

ORDERS		
ORDER_ID	ORDER_DATE	CUST_ID
1001	23/07/2006	KH01
1002	12/08/2006	KH01
1003	23/08/2006	KH02

CUSTOMERS		
CUST_ID	NAME	REG_DATE
KH01	Nguyen Van A	22/07/2006
KH02	Tran Ngoc Han	30/07/2006
KH03	Le Nhat Minh	15/03/2002

Insert into orders values (1024, '01/02/2005', 'KH01')

ORDERS		
ORDER_ID	ORDER_DATE	CUST_ID
1001	23/07/2006	KH01
1002	12/08/2006	KH01
1003	23/08/2006	KH02
1024	01/02/2005	KH01

CUSTOMERS		
CUST_ID	NAME	REG_DATE
KH01	Nguyen Van A	22/07/2006
KH02	Tran Ngoc Han	30/07/2006
KH03	Le Nhat Minh	15/03/2002

INSERTED		
ORDER_ID	ORDER_DATE	CUST_ID
1024	01/02/2005	KH01

DELETED		
ORDER_ID	ORDER_DATE	CUST_ID

```

CREATE OR ALTER TRIGGER trg_order_insert
ON ORDERS
AFTER INSERT
AS
DECLARE @ordate smalldatetime, @custid char(4)

```

```

DECLARE @regdate smalldatetime
BEGIN
    SELECT @ordate= ORDER_DATE, @custid= CUST_ID
    FROM          INSERTED

    SELECT @regdate= REG_DATE
    FROM    CUSTOMERS
    WHERE CUST_ID=@custid
    IF ( @ordate<@regdate)
    BEGIN
        PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
        ROLLBACK TRANSACTION
    END
END
END

```

--KIEM TRA HOAT DONG CUA TRIGGER

```

INSERT INTO ORDERS (ORDER_ID, ORDER_DATE, CUST_ID) VALUES (1024, '1/02/2005', 'KH01')

INSERT INTO ORDERS (ORDER_ID, ORDER_DATE, CUST_ID) VALUES (1025, '1/02/2009', 'KH01')

SELECT * FROM ORDERS

```

--Cách khác:

```

CREATE OR ALTER TRIGGER trg_order_insert
ON ORDERS
AFTER INSERT
AS
    DECLARE @ordate smalldatetime, @regdate smalldatetime
    BEGIN
        SELECT          @ordate= ORDER_DATE, @regdate= REG_DATE
        FROM            INSERTED i JOIN CUSTOMERS c ON i.CUST_ID=c.CUST_ID

        IF ( @ordate<@regdate)
        BEGIN
            PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
            ROLLBACK TRANSACTION
        END
    END
END

```

• TRIGGER trên nhiều dòng dữ liệu

```

CREATE OR ALTER TRIGGER trg_order_insert
ON ORDERS
AFTER INSERT
AS
    BEGIN
        IF (EXISTS(
            SELECT *
            FROM          INSERTED i JOIN CUSTOMERS c ON i.CUST_ID=c.CUST_ID
            WHERE ORDER_DATE< REG_DATE))
        BEGIN
            PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
            ROLLBACK TRANSACTION
        END
    END

```

END
END

b. Update order_date or cust_id of ORDERS table.

- TRIGGER trên một dòng dữ liệu

ORDERS			CUSTOMERS		
ORDER_ID	ORDER_DATE	CUST_ID	CUST_ID	NAME	REG_DATE
1001	23/07/2006	KH01	KH01	Nguyen Van A	22/07/2006
1002	12/08/2006	KH01	KH02	Tran Ngoc Han	30/07/2006
1003	23/08/2006	KH02	KH03	Le Nhat Minh	15/03/2002
1025	01/02/2009	KH01			
UPDATE ORDERS SET ORDER_DATE='1/1/2000', CUST_ID='KH02' WHERE ORDER_ID=1025					
ORDERS			CUSTOMERS		
ORDER_ID	ORDER_DATE	CUST_ID	CUST_ID	NAME	REG_DATE
1001	23/07/2006	KH01	KH01	Nguyen Van A	22/07/2006
1002	12/08/2006	KH01	KH02	Tran Ngoc Han	30/07/2006
1003	23/08/2006	KH02	KH03	Le Nhat Minh	15/03/2002
1025	01/01/2000	KH02			
INSERTED			DELETED		
ORDER_ID	ORDER_DATE	CUST_ID	ORDER_ID	ORDER_DATE	CUST_ID
1025	01/01/2000	KH02	1025	01/02/2005	KH01

```

CREATE OR ALTER TRIGGER trg_order_UPDATE
ON ORDERS
AFTER UPDATE
AS
    DECLARE @ordate smalldatetime, @regdate smalldatetime
BEGIN
    IF(UPDATE(ORDER_DATE) OR UPDATE(CUST_ID))
    BEGIN
        SELECT          @ordate= ORDER_DATE, @regdate= REG_DATE
        FROM            INSERTED i JOIN CUSTOMERS c ON i.CUST_ID=c.CUST_ID

        IF(@ordate<@regdate)
        BEGIN
            PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
            ROLLBACK TRANSACTION
        END
    END
END
END

```

--KIEM TRA HOAT DONG CUA TRIGGER:

```

UPDATE ORDERS SET ORDER_DATE='1/1/2000', CUST_ID='KH02' WHERE ORDER_ID=1025

UPDATE ORDERS SET ORDER_DATE='1/1/2021', CUST_ID='KH02' WHERE ORDER_ID=1025

```

```
SELECT * FROM ORDERS
```

• TRIGGER trên nhiều dòng dữ liệu

```
CREATE OR ALTER TRIGGER trg_order_update
ON ORDERS
AFTER UPDATE
AS

BEGIN
    IF(UPDATE(ORDER_DATE) OR UPDATE(CUST_ID))
    BEGIN
        IF(EXISTS(      SELECT *
                        FROM      INSERTED i JOIN CUSTOMERS c ON i.CUST_ID=c.CUST_ID
                        WHERE ORDER_DATE< REG_DATE))
        BEGIN
            PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
            ROLLBACK TRANSACTION
        END
    END
END
```

c. Update reg_date of CUSTOMERS table.

ORDERS			CUSTOMERS		
ORDER_ID	ORDER_DATE	CUST_ID	CUST_ID	NAME	REG_DATE
1001	23/07/2006	KH01	KH01	Nguyen Van A	22/07/2006
1002	12/08/2006	KH01	KH02	Tran Ngoc Han	30/07/2006
1003	23/08/2006	KH02	KH03	Le Nhat Minh	15/03/2002

UPDATE CUSTOMERS SET REG_DATE='01/01/2018' WHERE CUST_ID='KH01'

ORDERS			CUSTOMERS		
ORDER_ID	ORDER_DATE	CUST_ID	CUST_ID	NAME	REG_DATE
1001	23/07/2006	KH01	KH01	Nguyen Van A	01/01/2018
1002	12/08/2006	KH01	KH02	Tran Ngoc Han	30/07/2006
1003	23/08/2006	KH02	KH03	Le Nhat Minh	15/03/2002

INSERTED			DELETED		
CUST_ID	NAME	REG_DATE	ORDER_ID	ORDER_DATE	CUST_ID
KH01	Nguyen Van A	01/01/2018	KH01	Nguyen Van A	22/07/2006

```
CREATE OR ALTER TRIGGER trg_customers_update
ON CUSTOMERS
```

```

AFTER UPDATE
AS

BEGIN
    IF (UPDATE(REG_DATE))
    BEGIN
        IF (EXISTS(
            SELECT *
            FROM      INSERTED i JOIN ORDERS o ON i.CUST_ID=o.CUST_ID
            WHERE ORDER_DATE< REG_DATE))
        BEGIN
            PRINT 'ORDER_DATE MUST BE GREATER THAN REG_DATE'
            ROLLBACK TRANSACTION
        END
    END
END

```

2. TOTAL_ORDER of a customer must be equal to the sum of TOTAL of all order of this customer. Write a trigger to

a. Insert data into orders table.

- TRIGGER trên một dòng dữ liệu

CUSTOMERS		
CUST_ID	NAME	TOTAL_ORDER
KH08	Phan Thi Thanh	365,000
KH09	Le Ha Vinh	70,000
KH10	Ha Duy Lap	67,500

ORDERS		
ORDER_ID	CUST_ID	TOTAL
1017	KH08	35,000
1018	KH08	330,000
1020	KH09	70,000
1021	KH10	67,500

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1030, 'KH10', 500)		
CUSTOMERS		
CUST_ID	NAME	TOTAL_ORDER
KH08	Phan Thi Thanh	365,000
KH09	Le Ha Vinh	70,000
KH10	Ha Duy Lap	68,000

ORDERS		
ORDER_ID	CUST_ID	TOTAL
1017	KH08	35,000
1018	KH08	330,000
1020	KH09	70,000
1021	KH10	67,500
1030	KH10	500

INSERTED		
ORDER_ID	CUST_ID	TOTAL
1030	KH10	500
DELETED		
ORDER_ID	CUST_ID	TOTAL

```

CREATE OR ALTER TRIGGER TRG_ORDERS_INSERT
ON ORDERS
AFTER INSERT
AS

```

```

DECLARE @customerid CHAR(4), @ordtotal MONEY
BEGIN
    SELECT @customerid=CUST_ID, @ordtotal = TOTAL
    FROM      INSERTED

    UPDATE      CUSTOMERS
    SET          TOTAL_ORDER=TOTAL_ORDER+ @ordtotal
    WHERE       CUST_ID=@customerid
END

```

--KIEM TRA HOAT DONG CUA TRIGGER

```

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1030, 'KH10', 500)

```

```

SELECT * FROM ORDERS
SELECT * FROM CUSTOMERS

```

• TRIGGER trên nhiều dòng dữ liệu:

```

CREATE OR ALTER TRIGGER TRG_ORDERS_INSERT
ON ORDERS
AFTER INSERT
AS
BEGIN
    UPDATE      CUSTOMERS SET TOTAL_ORDER=
                TOTAL_ORDER+ (SELECT      SUM(TOTAL) FROM INSERTED i
                                WHERE      i.CUST_ID=CUSTOMERS.CUST_ID)
    WHERE CUST_ID IN (SELECT CUST_ID FROM INSERTED)
END

```

b. Delete data from orders table.

Chuẩn bị dữ liệu:

Insert into customers (cust_id, name, total_order) values ('KH15', 'MINH KHOI', 0)

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1031, 'KH15', 300)

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1032, 'KH15', 700)

```

SELECT * FROM ORDERS
SELECT * FROM CUSTOMERS

```

• TRIGGER trên một dòng dữ liệu:

CUSTOMERS			ORDERS		
CUST_ID	NAME	TOTAL_ORDER	ORDER_ID	CUST_ID	TOTAL
KH08	Phan Thi Thanh	365,000	1017	KH08	35,000
KH09	Le Ha Vinh	70,000	1018	KH08	330,000
KH10	Ha Duy Lap	67,500	1020	KH09	70,000
KH15	MINH KHOI	1,000	1021	KH10	67,500
			1031	KH15	300
			1032	KH15	700

DELETE FROM ORDERS WHERE ORDER_ID=1031

CUSTOMERS			ORDERS		
CUST_ID	NAME	TOTAL_ORDER	ORDER_ID	CUST_ID	TOTAL
KH08	Phan Thi Thanh	365,000	1017	KH08	35,000
KH09	Le Ha Vinh	70,000	1018	KH08	330,000
KH10	Ha Duy Lap	67,500	1020	KH09	70,000
KH15	MINH KHOI	700	1021	KH10	67,500
			1032	KH15	700

INSERTED			DELETED		
ORDER_ID	CUST_ID	TOTAL	ORDER_ID	CUST_ID	TOTAL
			1031	KH15	300

```

CREATE OR ALTER TRIGGER TRG_ORDERS_DELETE
ON ORDERS
AFTER DELETE
AS
    DECLARE @customerid CHAR(4), @ordtotal MONEY
BEGIN
    SELECT      @customerid=CUST_ID, @ordtotal = TOTAL
    FROM        DELETED

    UPDATE      CUSTOMERS SET TOTAL_ORDER=TOTAL_ORDER- @ordtotal
    WHERE       CUST_ID=@customerid
END

```

--Kiểm tra hoạt động của trigger:

```
DELETE FROM ORDERS WHERE ORDER_ID=1031
```

```
SELECT * FROM ORDERS
SELECT * FROM CUSTOMERS
```

CHUAN BI DU LIEU

```

Insert into customers (cust_id, name, total_order) values ('KH20', 'TIEN DAT', 0)
Insert into customers (cust_id, name, total_order) values ('KH21', 'LE HA', 0)

```

```

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1041, 'KH20', 500)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1042, 'KH20', 400)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1043, 'KH21', 900)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1044, 'KH21', 200)

```

```

SELECT * FROM ORDERS
SELECT * FROM CUSTOMERS

```

- TRIGGER trên nhiều dòng dữ liệu:


```

INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1050, 'KH26', 700)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1051, 'KH25', 100)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1052, 'KH25', 200)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1053, 'KH26', 500)
INSERT INTO ORDERS (ORDER_ID, CUST_ID, TOTAL) VALUES (1054, 'KH26', 600)

```

```

SELECT * FROM ORDERS
SELECT * FROM CUSTOMERS

```

<table><tr><th colspan="3">CUSTOMERS</th></tr><tr><th>CUST_ID</th><th>NAME</th><th>TOTAL_ORDER</th></tr><tr><td>KH25</td><td>HONG ANH</td><td>300</td></tr><tr><td>KH26</td><td>HA ANH</td><td>1800</td></tr></table>			CUSTOMERS			CUST_ID	NAME	TOTAL_ORDER	KH25	HONG ANH	300	KH26	HA ANH	1800	<table><tr><th colspan="3">ORDERS</th></tr><tr><th>ORDER_ID</th><th>CUST_ID</th><th>TOTAL</th></tr><tr><td>1050</td><td>KH26</td><td>700</td></tr><tr><td>1051</td><td>KH25</td><td>100</td></tr><tr><td>1052</td><td>KH25</td><td>200</td></tr><tr><td>1053</td><td>KH26</td><td>500</td></tr><tr><td>1054</td><td>KH26</td><td>600</td></tr></table>			ORDERS			ORDER_ID	CUST_ID	TOTAL	1050	KH26	700	1051	KH25	100	1052	KH25	200	1053	KH26	500	1054	KH26	600
CUSTOMERS																																						
CUST_ID	NAME	TOTAL_ORDER																																				
KH25	HONG ANH	300																																				
KH26	HA ANH	1800																																				
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1050	KH26	700																																				
1051	KH25	100																																				
1052	KH25	200																																				
1053	KH26	500																																				
1054	KH26	600																																				
UPDATE ORDERS SET CUST_ID='KH26', TOTAL=TOTAL+20 WHERE ORDER_ID>1051																																						
<table><tr><th colspan="3">CUSTOMERS</th></tr><tr><th>CUST_ID</th><th>NAME</th><th>TOTAL_ORDER</th></tr><tr><td>KH25</td><td>HONG ANH</td><td>100</td></tr><tr><td>KH26</td><td>HA ANH</td><td>2060</td></tr></table>			CUSTOMERS			CUST_ID	NAME	TOTAL_ORDER	KH25	HONG ANH	100	KH26	HA ANH	2060	<table><tr><th colspan="3">ORDERS</th></tr><tr><th>ORDER_ID</th><th>CUST_ID</th><th>TOTAL</th></tr><tr><td>1050</td><td>KH26</td><td>700</td></tr><tr><td>1051</td><td>KH25</td><td>100</td></tr><tr><td>1052</td><td>KH26</td><td>220</td></tr><tr><td>1053</td><td>KH26</td><td>520</td></tr><tr><td>1054</td><td>KH26</td><td>620</td></tr></table>			ORDERS			ORDER_ID	CUST_ID	TOTAL	1050	KH26	700	1051	KH25	100	1052	KH26	220	1053	KH26	520	1054	KH26	620
CUSTOMERS																																						
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INSERTED																																						
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1052	KH26	220																																				
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ORDER_ID	CUST_ID	TOTAL																																				
1052	KH25	200																																				
1053	KH26	500																																				
1054	KH26	600																																				

Customer: kh26

Total_order = 1800 + (220) +(520-500) + (620-600)
 = 1800 + (220+520+620)-(500+600)

```

CREATE OR ALTER TRIGGER TRG_ORDERS_UPDATE
ON ORDERS
AFTER UPDATE
AS
BEGIN
    UPDATE CUSTOMERS
    SET TOTAL_ORDER=TOTAL_ORDER+
      (SELECT SUM(TOTAL) FROM INSERTED i
      WHERE i.CUST_ID=CUSTOMERS.CUST_ID)

```

```
WHERE      CUST_ID IN (SELECT CUST_ID FROM INSERTED)

UPDATE     CUSTOMERS
SET        TOTAL_ORDER=TOTAL_ORDER-
          (SELECT      SUM(TOTAL) FROM DELETED d
           WHERE d.CUST_ID=CUSTOMERS.CUST_ID)
WHERE      CUST_ID IN (SELECT CUST_ID FROM DELETED)
END
```

--KIEM TRA HOAT DONG CUA TRIGGER

```
UPDATE ORDERS SET CUST_ID='KH26', TOTAL=TOTAL+20
WHERE ORDER_ID>1051
```