Lab 5 (2%)

Triggers

topics

* Triggers: <https://docs.microsoft.com/en-us/sql/relational-databases/triggers/dml-triggers?view=sql-server-ver15>

Group work acknowledgment

We, Mansoor Ahmad Zafar, declare that the attached assignment is our own work in accordance with the Seneca Academic Policy. No part of this assignment has been copied manually or electronically from any other source (including web sites) **or distributed to other students.**

Specify below what each member has done towards the completion of this work:

Name Task(s)

1- Mansoor Ahmad Zafar Everything

2-

3-

Before you start

You are to create a new database named “AviaCo” and run the sql script you are given to create the tables in the database.

If you already have the database created,

* delete all data from all tables and run all the insert commands all over again.

Or

* delete the existing aviaco database you already have, recreate a database named AviaCo and then run the sql script as is.

Instructions

Answer each of the following questions and show the result set underneath each part.

1. [10pts] Create a trigger named limitnbcharters that limits the number of booked charters per customer in a current month. The trigger fires with a 'instead of' statement when charter records are inserted in the charter table. if the number of charters over the current month for the is less than 3, complete the insert. otherwise abort the insert. Assume the multi-row insert command into charter has the same customer code.

-- Trigger

create trigger limitnbcharters

on charter

instead of insert

as

begin

if @@rowcount=0

return;

set nocount on;

declare @cus\_code int

set @cus\_code = (select i.cus\_code from inserted i)

declare @nOfBooking int

select @nOfBooking=(select count(\*) from CHARTER chart where chart.CUS\_CODE = i.CUS\_CODE and month(chart.CHAR\_DATE) = month(c.CHAR\_DATE))

from inserted i

join charter c on c.CUS\_CODE = i.CUS\_CODE

if @nOfBooking < 3

begin

insert into charter(char\_trip, CUS\_CODE)

select i.char\_trip, i.cus\_code

from inserted i

print 'charter records have been added to the db'

end

ELSE

begin

print concat('Customer ', @cus\_code, ' has already reached the limit with number of charters 3')

end

end

go

-- Testing

insert into CHARTER (char\_trip, cus\_code) values (10019, 10014)

insert into CHARTER (char\_trip, cus\_code) values (10019, 10012)

**testing with abort result: cus\_code 10014**

**A screen shot of a computer

Description automatically generated**

**testing with insert result: cus\_code 10012**

**A screenshot of a computer program

Description automatically generated**

1. [10pts] TTAF = Total Time Airframe = the number of hours it has been in the air since new from the factory. No maintenance will change this number ever. Create a trigger named increaseTTAF that increments the TTAF (AC\_TTAF) of the aircraft. The trigger should fire after insert into charters and increase the TTAF in aircraft table with CHAR\_HOURS\_FLOWN given the inserted charter records.

-- Trigger

create trigger increaseTTAF

on charter

after insert

as

begin

update aircraft

set AC\_TTAF = AC\_TTAF + (select sum(i.CHAR\_HOURS\_FLOWN) from inserted i where i.AC\_NUMBER= aircraft.AC\_NUMBER)

where AC\_NUMBER in(select i.AC\_NUMBER from inserted i)

end

go

-- testing scenario 1: one-row insert

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P';

-- before trigger

/\*

ac\_number ac\_TTAF

1484P 1833.1

\*/

--

-- fire the trigger with ac\_number '1484P' and hours\_flown=5

insert into charter (char\_trip, ac\_number, char\_hours\_flown) values (10019, '1484P', 5);

-- after the trigger

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P';

/\*

ac\_number ac\_TTAF

1484P 1838.1

\*/

-- testing scenario 2: multi-row insert

select \* from aircraft;

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P' or ac\_number= '2289L';

-- before trigger

/\*

ac\_number ac\_TTAF

1484P 1838.1

2289L 4243.8

\*/

--

-- fire the trigger with ac\_number '1484P' and hours\_flown=2, and ac\_number '2289L' and hours\_flown=5,

begin transaction

insert into charter (char\_trip, ac\_number, char\_hours\_flown) values (10020, '1484P', 5), (10021, '2289L', 5);

go

-- after the trigger

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P' or ac\_number= '2289L';

/\*

ac\_number ac\_TTAF

1484P 1843.1

2289L 4248.8

\*/

1. [10pts] Create a trigger named decreaseTTAF that subtracts the CHAR\_HOURS\_FLOWN from the TTAF (AC\_TTAF) of the aircraft. The trigger should fire after deleting charter records and decrease the TTAF in aircraft table by CHAR\_HOURS\_FLOWN given in the deleted charter records.

-- Trigger

create trigger decreaseTTAF

on charter

after delete

as

begin

update aircraft

set AC\_TTAF = AC\_TTAF - (select char\_hours\_flown from deleted where ac\_number = aircraft.AC\_NUMBER)

where ac\_number in (select ac\_number from deleted)

end

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-- testing scenario 1: one-row delete

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select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip = 10019;

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P';

-- before the trigger

/\*

char\_trip ac\_number char\_hours\_flown

10019 1484P 5

\*/

/\*

ac\_number ac\_TTAF

1484P 1843.1

\*/

-- fire the trigger

delete from charter where char\_trip= 10019;

-- after the trigger

select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip = 10019;

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P';

/\*

ac\_number ac\_TTAF

1484P 1838.1

\*/

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-- testing scenario 2: multi-row delete

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-- before the trigger

select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip= 10020 or char\_trip = 10021;

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P' or ac\_number= '2289L';

/\*

char\_trip ac\_number char\_hours\_flown

10020 1484P 5

10021 2289L 5

ac\_number ac\_TTAF

1484P 1838.1

2289L 4248.8

\*/

-- fire the trigger

delete from charter where char\_trip in (10020, 10021);

-- after the trigger

select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip= 10020 or char\_trip = 10021;

select ac\_number, ac\_TTAF from aircraft where ac\_number= '1484P' or ac\_number= '2289L';

/\*

ac\_number ac\_TTAF

1484P 1833.1

2289L 4243.8

\*/

1. Create a trigger named updateAC\_TTAF on charter after update that checks if the ac\_number or the char\_hours\_flown is different between inserted and deleted. Inner join inserted and deleted and count the number of rows with different ac\_number of char\_hours\_flown.

if the update command changes ac\_number or char\_hours\_flown,

the trigger should decrements the TTAF of the airplanes that show in deleted

and increment the TTAF of the airplanes that show in the inserted by CHAR\_HOURS\_FLOWN.

-- Trigger

alter trigger updateAC\_TTAF

on charter

after update

as

begin

declare @ac\_num varchar(5)

declare @hrs int

declare @count int

declare insertptr cursor

for select ac\_number, char\_hours\_flown

from inserted

declare deleteptr cursor

for select ac\_number, char\_hours\_flown

from deleted

open insertptr

fetch next from insertptr into @ac\_num, @hrs

--increment for insert

while @@FETCH\_STATUS=0

begin

if @ac\_num not in (select ac\_number from deleted)

begin

set @count = @count + 1;

--incrememt

update aircraft

set AC\_TTAF = AC\_TTAF + @hrs

where AC\_NUMBER = @ac\_num

end

fetch next from insertptr into @ac\_num, @hrs

end

close insertptr

deallocate insertptr

--decrement for deleted

open deleteptr

fetch next from deleteptr into @ac\_num, @hrs

while @@FETCH\_STATUS=0

begin

if @ac\_num in (select ac\_number from inserted)

begin

-- count was already set from the first one

-- to add count in here would just x2 the value for no reason

update aircraft

set AC\_TTAF = AC\_TTAF - @hrs

where AC\_NUMBER = @ac\_num

end

fetch next from deleteptr into @ac\_num, @hrs

end

close deleteptr

deallocate deleteptr

end

go

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-- testing scenario 2: one-row delete

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-- before the trigger

select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip= 10018;

SELECT AC\_NUMBER, AC\_ttaf FROM AIRCRAFT WHERE AC\_NUMBER= '4278Y';

/\*

char\_trip ac\_number char\_hours\_flown

10018 4278Y 10

AC\_NUMBER AC\_ttaf

1484P 1833.1

2289L 4243.8

2778V 7992.9

4278Y 2147.3 -- targeted

\*/

-- fire the trigger

begin transaction

update charter

set char\_hours\_flown = 5

where char\_trip= 10018;

go

-- after the trigger

select char\_trip, ac\_number, char\_hours\_flown from charter where char\_trip= 10018;

SELECT AC\_NUMBER, AC\_ttaf FROM AIRCRAFT;

/\*

char\_trip ac\_number char\_hours\_flown

10018 4278Y 5

AC\_NUMBER AC\_ttaf

1484P 1833.1

2289L 4243.8

2778V 7992.9

4278Y 2142.3 -- targeted

\*/

SUBMISSION

Submit your lab5\_GroupX.doc file on BB. Replace X with your group number.

If a student does not contribute to the work, do not list his/her name(s) under the group section in the lab file and will get 0.