SQL – Views

Carla Teixeira Lopes

Bases de Dados
Mestrado Integrado em Engenharia Informática e Computação, FEUP

Agenda

View CSaccept

Create View CSaccept As

Select sID, cName

From Apply

Where major = 'CS' and dec = 'Y';

Select *
From CSaccept

→

sID	cName
123	Stanford
123	Berkeley
345	Cornell
987	Stanford
987	Berkeley

Delete from CSaccept

Delete from CSaccept

Where sID = 123;

———————▶ Error: SQLite does not allow to modify views

Create trigger CSacceptDelete

instead of delete on Csaccept

For each row

Begin

   Delete from Apply

   Where sID = Old.sID and cName = Old.cName and

       major = 'CS' and dec = 'Y';

End;

sID	cName
123	Stanford
123	Berkeley
345	Cornell
987	Stanford
987	Berkeley

Delete from CSaccept

CSaccept

sID	cName
123	Stanford
123	Berkeley
345	Cornell
987	Stanford
987	Berkeley

Apply

sID	cName	major	dec
123	Stanford	CS	Y
123	Stanford	EE	N
123	Berkeley	CS	Y
123	Cornell	EE	Y
234	Berkeley	biology	N
345	MIT	bioengineering	Y
345	Cornell	bioengineering	N
345	Cornell	CS	Y
345	Cornell	EE	N
678	Stanford	history	Y
987	Stanford	CS	Y
987	Berkeley	CS	Y
876	Stanford	CS	Y
876	MIT	biology	Y
876	MIT	marine biology	N
765	Stanford	history	Y
765	Cornell	history	N

Create trigger CSacceptDelete

instead of delete on Csaccept

For each row

Begin

   Delete from Apply

   Where sID = Old.sID and

       cName = Old.cName and

       major = 'CS' and dec = 'Y';

End;

Delete from CSaccept

Delete from CSaccept

Where sID = 123;

sID	cName
345	Cornell
987	Stanford
987	Berkeley

Apply

sID	cName	major	dec
123	Stanford	EE	N
123	Cornell	EE	Y
234	Berkeley	biology	N
345	MIT	bioengineering	Y
345	Cornell	bioengineering	N
345	Cornell	CS	Y
345	Cornell	EE	N
678	Stanford	history	Y
987	Stanford	CS	Y

Update CSaccept

sID	cName
345	Cornell
987	Stanford
987	Berkeley

→ Change this acceptance to Carnegie Melon

Update CSaccept

Set cName = 'CMU'

Where sID = 345;

→ Error: SQLite does not allow to modify views

Update CSaccept

Create trigger CSacceptUpdate

instead of update of cName on Csaccept

For each row

Begin

   Update Apply

   Set cName = New.cName

   Where sID = Old.sID and cName = Old.cName and

       major = 'EE' and dec = 'N';

End;

Update CSaccept

CSaccept

sID	cName
345	Cornell
987	Stanford
987	Berkeley

Apply

sID	cName	major	dec
123	Stanford	CS	Y
123	Stanford	EE	N
123	Berkeley	CS	Y
123	Cornell	EE	Y
234	Berkeley	biology	N
345	MIT	bioengineering	Y
345	Cornell	bioengineering	N
345	Cornell	CS	Y
345	Cornell	EE	N
678	Stanford	history	Y
987	Stanford	CS	Y
987	Berkeley	CS	Y
876	Stanford	CS	Y
876	MIT	biology	Y
876	MIT	marine biology	N
765	Stanford	history	Y
765	Cornell	history	N

Create trigger CSacceptUpdate

instead of update of cName on Csaccept

For each row

Begin

    Update Apply

    Set cName = New.cName

    Where sID = Old.sID and cName = Old.cName

        and major = 'EE' and dec = 'N';

End;

Update CSaccept

Update CSaccept

Set cName = 'CMU'

Where sID = 345;

Nothing in the system is checking the correctness of the translation

CSaccept

sID	cName
345	Cornell
987	Stanford
987	Berkeley

Apply

sID	cName	major	dec
123	Stanford	EE	N
123	Cornell	EE	Y
234	Berkeley	biology	N
345	MIT	bioengineering	Y
345	Cornell	bioengineering	N
345	Cornell	CS	Y
345	CMU	EE	N
678	Stanford	history	Y
987	Stanford	CS	Y

Update CSaccept

Create trigger CSacceptUpdate

instead of update of cName on Csaccept

For each row

Begin

   Update Apply

   Set cName = New.cName

   Where sID = Old.sID and cName = Old.cName and

       major = 'CS' and dec = 'Y';

End;

View CSEE

Create View CSEE As

Select sID, cName, major

From Apply

Where major = 'CS' or major = 'EE';

Select *
From CSEE

→

sID	cName	major
123	Stanford	EE
123	Berkeley	EE
345	Cornell	CS
345	CMU	EE
987	Stanford	CS
987	Berkeley	CS
876	Stanford	CS
543	MIT	CS

Insert on CSEE

Insert into CSEE values (111, 'Berkeley', 'CS'); ⟶ Error: SQLite does not allow to modify views

Create trigger CSEEinsert

Instead of insert on CSEE

For each row

Begin

   Insert into Apply values (New.sID, New.cName, New.major, null);

End;

Insert on CSEE

Insert into CSEE values
(111, 'Berkeley', 'CS');

CSEE

sID	cName	major
123	Stanford	EE
123	Berkeley	EE
345	Cornell	CS
345	CMU	EE
987	Stanford	CS
987	Berkeley	CS
876	Stanford	CS
543	MIT	CS
111	Berkeley	CS

Apply

sID	cName	major	dec
123	Stanford	EE	N
…	…	…	…
543	MIT	CS	N
111	Berkeley	CS	Null

Insert on CSEE

Insert into CSEE **values**
(222, 'Berkeley', 'biology');

CSEE

sID	cName	major
123	Stanford	EE
123	Berkeley	EE
345	Cornell	CS
345	CMU	EE
987	Stanford	CS
987	Berkeley	CS
876	Stanford	CS
543	MIT	CS
111	Berkeley	CS

Apply

sID	cName	major	dec
123	Stanford	EE	N
…	…	…	…
111	Berkeley	CS	Null
222	Berkeley	biology	Null

Don't want insertions on a view that affect the base tables and not the view

Insert on CSEE

Drop trigger CSEEinsert;

Create trigger CSEEinsert

Instead of insert on CSEE

For each row

When New.major = 'CS' or New.major = 'EE'

Begin

   Insert into Apply values (New.sID, New.cName, New.major, null);

End;

Insert on CSEE

Insert into CSEE values
(333, 'Berkeley', 'biology');

CSEE

sID	cName	major
123	Stanford	EE
123	Berkeley	EE
345	Cornell	CS
345	CMU	EE
987	Stanford	CS
987	Berkeley	CS
876	Stanford	CS
543	MIT	CS
111	Berkeley	CS

Apply

sID	cName	major	dec
123	Stanford	EE	N
…	…	…	…
111	Berkeley	CS	Null
222	Berkeley	biology	Null

Insert on CSEE

Insert into CSEE values
(333, 'Berkeley', 'EE');

CSEE

sID	cName	major
123	Stanford	EE
123	Berkeley	EE
345	Cornell	CS
345	CMU	EE
987	Stanford	CS
987	Berkeley	CS
876	Stanford	CS
543	MIT	CS
111	Berkeley	CS
333	Berkeley	EE

Apply

sID	cName	major	dec
123	Stanford	EE	N
…	…	…	…
222	Berkeley	biology	Null
333	Berkeley	EE	Null

Kahoot time!

Any doubts?

Readings

Jeffrey Ullman, Jennifer Widom, A first course in
Database Systems 3rd Edition

    Section 8.1 – Virtual Views

    Section 8.2 – Modifying Views