

Zachary Taylor HW#2

ch 5

5.11

abfgj

5.11

integrity constraints

df

5.17

entity - no prim key is null

ch 8

referential - a tuple in a relation must refer

8.18

to a tuple in another

8.22

entity that exists

ch 9

9.4

a) insert Robert F scott 943745431972-
2363 New castle M 58000 988665555]

in employee

no constraint error

b) Product A 4 bellaire 2 in project

referential constraint Dnum 2
refers to a department that
does not exist.

This constraint can be enforced by
not allowing projects with impossible
dnum to be added.

f) delete works-on tuples with ESSN
333445555

No error. There are no external references to these tuples.

g) delete employee tuple with ssn 987654321

referential errors. Jennifer is a supervisor to alicia and also the mgr to administration. Deleting her from employee means both of those point to invalid data. To fix you could simply require the editing of super-ssn and mgr-ssn if one happens to be a super.

i) modify mgr-ssn and mgr-start-date of the department tuple with Dnumber=5 to 123456789 and '2007-10-01'

First several referential errors. First 123456789 becomes his own super and thus now has outdated super-ssn. 2nd all other members of department 5 have outdated super-ssn. Simply require these changes/updates before allowing modification to fix.

5.17

Sale has foreign key Salesperson-id
" " " " serial_no

I assume options are their own part
they have their own serial_no independent
of car serial_no.

Car

<u>Serial no</u>	<u>Model</u>	<u>Manufacturer</u>	<u>Price</u>
123	car-1	Car-Co	\$5
456	car-2	Lot-Cars	\$25
789	car-3	Car-Co	\$125

Option

<u>serial No</u>	<u>option Name</u>	<u>Price</u>
321	speakers	\$10,000
654	bluetooth	\$15
987	options	\$10

Sale

<u>Salesperson-id</u>	<u>Serial-no</u>	<u>Date</u>	<u>Sale-amount</u>	<u>Salesperson-id</u>	<u>Name</u>	<u>Phone</u>
1894	789	1/01/1991	\$125	1894	Tom	801 333 44
1999	654	1/02/1991	\$15	1999	Jerry	802 444 555
1999	987	1/02/1991	\$10			

violation

insert

Sale < 1111, 111, 1111111, 12

There is no salesperson 1111 or
serial 1111.

Non

insert

Sale < 1999, 321, 1031999, 100007

Ch 8

Fig 8.14

8.18)

a) How many copies of the lost tribe
in Sharpstown?

Sharpstown \leftarrow branch-name = Sharpstown Library-Branch

books \leftarrow BookCopies Sharpstown
 $\text{branch_id} = \text{sharpstowns branch_id}$

result \leftarrow (T_i (books \bowtie (no_of_copies book_id = book_id \bowtie tribe = lost tribe book)))

b) How many copies are owned by each?
tribe \leftarrow (book_id = the lost tribe book)

result \leftarrow (book_copies \bowtie tribe
 $\text{Book_id} = \text{book_id}$)

c) The names of all borrowers who do not have any books checked out.

notbor ← Borrower ($\pi_{\text{Card-no}}$ Borrower) \sqcap ($\pi_{\text{Book-bans}}$ Borrower)

result $\leftarrow \Pi_{name} \left(Borrower \setminus \{not bor\} \mid card_no = card_no \right)$

d) for each book that is loaned out from Sharpsstown and whose due-date is today, retrieve the book title, borrower's name and address.

bfs ← (Book-Loan) (Tl (S
 branchid=branch_id branch_name=sharpstown Library-Branch)
 branchid=branch_id
 special ← (S bfs)
 Due_date=today)

see d2) branch
① for each branch, retrieve name
and total number of books loaned from
that branch. see c2)

$\rightarrow d2) \left(\begin{matrix} book \\ \text{book_id} = book_id \end{matrix} \right) \left(\begin{matrix} BORROWER \\ \text{card_no} = card_no \end{matrix} \right)$

Result $\left(\begin{array}{l} \text{book_name,} \\ \text{borrower_name,} \\ \text{borrower_address} \end{array} \right)$

f) retrieve names, addresses, and
checked out for all w/ > 3
books checked out.

g) for each book authored or coauthored
by Stephen King, retrieve title
and # copies owned by central

e2) $\leftarrow \text{Book} \bowtie \text{Library_branch}$
 $\text{branch_id} = \text{branch_id}$

Count_books $\leftarrow \left(\text{Branch_id} \ 3 \text{count} \ \text{book_id} \right)$
result $\leftarrow \left(\text{branch_book_count} \ \text{branch_id} = \text{Branch_id} \right)$

f) $\leftarrow \left(\text{Card_no} \ 3 \text{count} \ \text{book_id} \ \text{Book_Loans} \right)$

BWS $\leftarrow \left(\text{Borrower} \bowtie \left(\text{Card_no} \ \text{count_book} \right) \right)$

result $\leftarrow \left(\text{BWS} \ \text{name}, \ \text{address}, \ \text{count_book} \right)$

g)

Count book id

~~book_id~~ ~~book_name~~ ~~book_id = book_id~~

central $\left(\pi_{\text{branch_id}}^{\text{O}} \text{branch_name} = \text{central} \right) \text{Library-Branch}$

bac $\left(\pi_{\text{branch_id}}^{\text{O}} \text{book_copies} \right) \text{book}$

SK $\left(\pi_{\text{author_name}}^{\text{O}} \text{book_Author} \right) \text{book} \left(\text{bac} \right)$

result $\left(\pi_{\text{title}}^{\text{O}} \text{book} \right) \left(\text{bac} \right) \left(\text{SK} \right)$

ST 11.11
A-ST = 9.11

8 A 8 0 9
0 0 0 0 0
2 0 2 0 0
0 0 0 0 0
0 0 0 0 0

8.22)

a) $T_1 \bowtie T_2$
 $T_1.P = T_2.A$

P	Q	R	A	B	C
10	a	S	10	b	G
10	a	S	10	b	S
25	a	b	25	C	3

b) $T_1 \bowtie T_2$
 $T_1.Q = T_2.B$

P	Q	R	A	B	C
15	b	8	10	b	6
15	b	R	10	b	S

c) $T_1 \bowtie T_2$
 $T_1.P = T_2.A$

P	Q	R	A	B	C
10	a	S	10	b	G
10	a	S	10	b	S
15	b	8	null	null	null
25	a	b	25	C	3

d) $T_1 \bowtie T_2$

$$T_1.Q = T_2.B$$

P Q R A B C

15 6 8 10 6 5

15 6 8 10 6 5

null null null 25 C 3

e) $T_1 \sqcup T_2$

A B C

10 a 5

15 b 8

25 a 6

10 b 6

25 c 3

10 b 5

f) $T_1 \bowtie T_2$

$$T_1.P = T_2.A \text{ and } T_1.R = T_2.C$$

P Q R A B C

10 a 5 10 b 5

92.81

9.4

Ship-type		
Type	Tonnage	Hull

Ship	owner	ship-type	home-port	port
sname				

port	state-name	on-name
pname		

state/country	Continent
name	

ship-movement	sname	Date	time	longitude
timestamp				

port-visit	start-date	End-date
sname	pname	

sea/ocean/lake collapsed
into on-name due
to lack of season as
a relation.