CS 455: Principles of Database Systems

Review Guide 2: SQL (Selected Answers)

books

BNO	Title	Author	Date	Edition
231	The Soul of a New Machine	Tracy Kidder	1981	1
77	Programming Pearls	Jon Bentley	2000	2
23	Programming Pearls	Jon Bentley	1981	1
2	Tess of the d'Urbervilles	Thomas Hardy	1850	1

publishers

PNO	Publisher	City	Web Site
1	Back Bay Books	Boston	backbay.com
2	Addison Wesley	New York	addisonwesley.com
3	Modern Library	London	randomhouse.com
4	Penguin	New York	penguin.com

publishes

PNO	BNO	Pages	Copyright
1	231	293	1981
2	77	235	2001
2	23	200	1980
3	2	565	2001
4	2	540	1990

Assumptions:

- *BNO* are unique book identifiers.
- *PNO* are unique publisher identifiers.
- The date in the *books* relation represents the year the book was originally issued. The date in the *publishes* table represents the copyright date when that particular publisher issued it.

Problems

1. Give the SQL statements to create all tables in this database. Remember to set all integrity constraints, including primary and foreign keys.

2. A CS student screwed up entering all the books' editions (thinking 0 stood for the first edition when normal people use a 1 to indicate the first). Increase every book edition by 1 using a single SQL statement.

3. ** Delete all books that have never been published (do not have an entry in the **publishes** relation).
```
DELETE FROM books WHERE BNO NOT IN
(SELECT BNO FROM publishes);
```

4. Retrieve all *distinct* book titles and authors that published in New York.
```
SELECT DISTINCT Title, DISTINCT Author
FROM books NATURAL JOIN publishes NATURAL JOIN publishers
WHERE Publisher='New York';
```

5. Retrieve the titles, publishers, and copyright dates of all first edition books using subqueries only and no joins.
```
SELECT Title,Publisher,Copyright
FROM books, publishes, publishers
WHERE books.BNO=publishes.BNO AND publishers.PNO=publishes.PNO AND publishes.BNO IN (SELECT
BNO FROM books WHERE edition=1);
```

6. Per each copyright year, find the maximum and minimum number of pages published.
Solution: `SELECT Copyright,min(Pages),max(Pages) FROM publishes GROUP BY Copyright;`

7. What year did Thomas Hardy publish his first book?

8. ** Who published Thomas Hardy's most recent book?

9. As mentioned in the lectures, *outer join* expressions in SQL (and relational algebra) are short-hands for more involved queries. Rewrite the following statement without using the *outer join* expression.
Solution:
```
select * from books natural join publishes
union
select books.BNO,Title,Author,Date,Edition,NULL,NULL,NULL
from books, publishes
where NOT EXISTS (select * from books where books.BNO = publishes.BNO);
```