CS 166: Lab 4 Assignment: The Relational Algebra

OCTOBER 21, 2019

The purpose of the following assignment is to practice the relational algebra. To do this assignment, you may need to read the lab notes (Lab 4). Please use the relational algebra operators to write the queries.
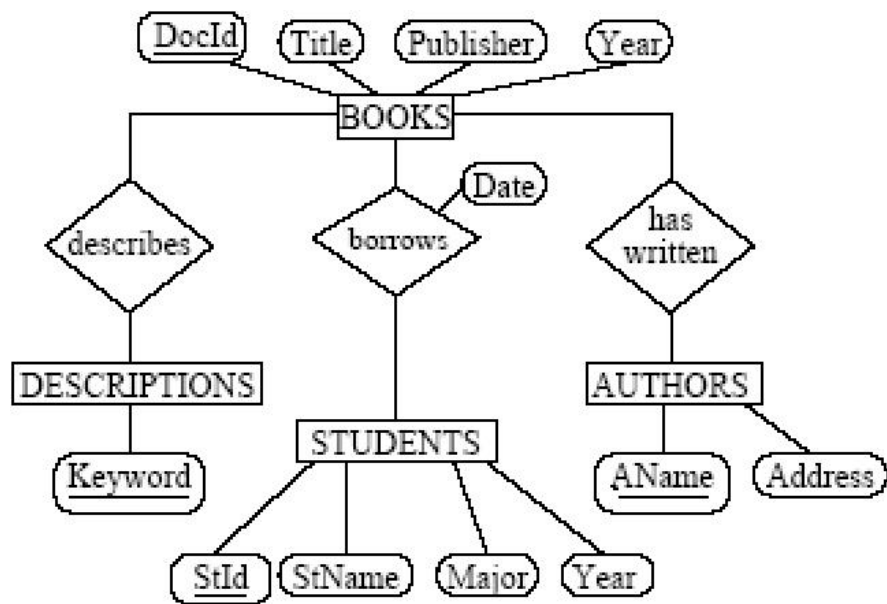
Assume that the following relations exist:

- BOOKS(DocId, Title, Publisher, Year)

- STUDENTS(StId, StName, Major, Age)

- AUTHORS(AName, Address)

- borrows(DocId, StId, Date)

- has-written(DocId, AName)

- describes(DocId, Keyword)

The following shows the entity relationship diagram. The key fields of the relations are underlined in the ER diagram.

Write the following queries in relational algebra:

1. List the year and title of each book

2. List all information about students whose major is CS

3. List all students with books they can borrow

4. List all books published by McGraw-Hill before 1990

5. List the name of those authors who are living in Davis

6. List the name of students who are older than 30 and who are not studying CS

7. Rename AName in the relation AUTHORS to Name

8. List the names of all students who have borrowed a book and who are CS majors

9. List the title of books written by the author "Jones"

10. As previous, but not books that have the keyword "database"

11. Find the name of the youngest student

12. Find the title of the oldest book