**Relational Schema**

BookStores

|  |  |
| --- | --- |
| **Bookstore\_ID** | B\_University\_name |

University

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **University\_ID** | University\_Name | U\_BookStore\_ID | City | State |

Students

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Student\_ID** | Password | S\_University\_ID | Stud\_Name | Email\_Address | S\_Major |

Semester

|  |  |  |
| --- | --- | --- |
| **Semester\_ID** | Semester\_Name | Sem\_university\_ID |

Courses

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course\_ID** | **C\_Semester\_ID** | **C\_University\_ID** | C\_textbook\_name | Major | C\_Type\_textbook | Student’s enrolled |

Standard\_Books

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ISBN** | Textbook\_Name | Author | Std\_Price | No\_of\_books\_available | **BookStore\_ID** |

Customized\_Books

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SKU\_Code** | Textbook\_name | Author | Cust\_Price | No\_of\_books\_available | **BookStore\_ID** |

TextBooks

|  |  |
| --- | --- |
| **Book\_Code** | **BookStore\_ID** |

Buy

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Buy\_Price | **Book\_Code** | **BookStore\_ID** | **Student\_ID** | Date\_Sold | Qty\_bought | Type\_textbook |

Rent

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Student\_ID** | **ISBN** | **BookStore\_ID** | Rent\_Price | Date\_rented | Qty\_bought | Renewal |

Relational Algebra Querries

1. Query: Display all the University info and Students info studying in respective University(University Name,City,State,Student ID,Student Name,Email Address ,Major)

Relational Algebra:

π University\_name,City,State,Student\_ID,Student\_Name, ,Email Address,Major (Students⋈ Students.S\_University\_ID=University.University\_ID University)).

2. Query: Display University info and Students info of student named "muffa"

Relational Algebra:

π University\_name,City,State,Student\_ID,Student\_Name, ,Email Address,Major

(Student\_name=”muffa”(Students⋈ Students.S\_University\_ID=University.University\_ID University)).

3. Query: Display student info ,standard book info and date when bought and quantity info related to the students who have bought standard book from BookStore with ID 1

Relational Algebra:  
π Student\_Name,Email Address,S\_Major,ISBN,Textbook\_Name,Author,Std\_Price,Date\_Sold,Qty\_bought(B\_BookStore\_ID='1' AND B\_Tpe\_Textbook='Standard' ((Buy⋈ Buy.B\_BookStore\_ID =Standard\_S\_BookStore\_ID and buy.B\_Book\_Code =standard\_books.ISBN (Standard\_books)) ⋈ buy.B\_Student\_ID =Students.Student\_ID(Students))

4. Query: Display University name and id and count of Standard Books only when more than 1 Standard book is available

Relational Algebra:

T1(University\_ID, StandardBooks)← University\_ID ℑ Count C\_Type\_Textbook(Courses)

T2 ← σ StandardBooks >1(T1)

RESULT ← πUniversity\_name, University\_ID,StandardBooks(T2 \* University)

5. Query: Display Student name and no of books bought by student only if student bought more than 1 book

Relational Algebra:

T1(Student\_ID, Books\_bought)← Student\_ID ℑ Sum Qty\_bought(Buy)

T2 ← σ Books\_bought >1(T1)

RESULT ← πStudent\_name, Student\_ID,books\_bought(T2 \* Students)

6. Query: Display all Standard TextBooks Info of a particular Author available at a BookStore.

Relational Algebra:

πTextbook\_Name,Author,No\_of\_books\_available,BookStore ID(Author\_Name=”Dr. Elmasari” (Standard\_BooksStandard\_Books.BookStore \_ID=BookStores.BookStore\_ID ⋈ BookStores))

7. Query: Display customized textbooks info with code “121” and University name to which it belongs.

Relational Algebra:

πUniversity\_name,Textbook\_name,Author,No\_of\_books\_available(SKU\_Code=”121”

(Customized\_BooksCustomized\_Books.BookStore\_ID=University.U\_BookStore\_ID ⋈ University))

8. Query: Display all Standard TextBooks available at a BookStore.

Relational Algebra:

πTextbook\_Name,Author,University\_Name(S\_BookStore\_ID=”1” (Standard\_BooksStandard\_Books.S\_BookStore \_ID=BookStores.BookStore\_ID ⋈ BookStores) ⋈ BookStores.BookStore\_ID =university.U\_BookStore\_ID University))

9. Query: Show all the books name rented by a student whose student id is 1004 and BookStore id is 1

Relational Algebra:

π Textbook\_Name,Student\_name (R\_Student\_ID = “ 1004 “,R\_Bookstore\_ID=”1” (Rent⋈rent.R\_Student\_ID=students.Student\_ID Students)⋈ Rent.R\_ISBN

= Standard\_Books.ISBN Standard\_Books ) ⋈ Rent.R\_BookStore\_ID

= university\_U\_BookStore\_ID University))

10. Query: Display all the Textbooks Name available for Fall semester for specific Major at a particular University.

Relational Algebra:

π C\_TextBook\_Name,C\_Major,C\_Type\_Textbook,Semester\_Name(C\_Major = “ Computer Science”,C\_University\_ID=”1”,Semester\_Name=”Fall” (Courses⋈ Courses.C\_Semester\_ID=Semesters.Semester\_ID Semesters) ⋈ Courses.C\_University\_ID=University\_ID University).