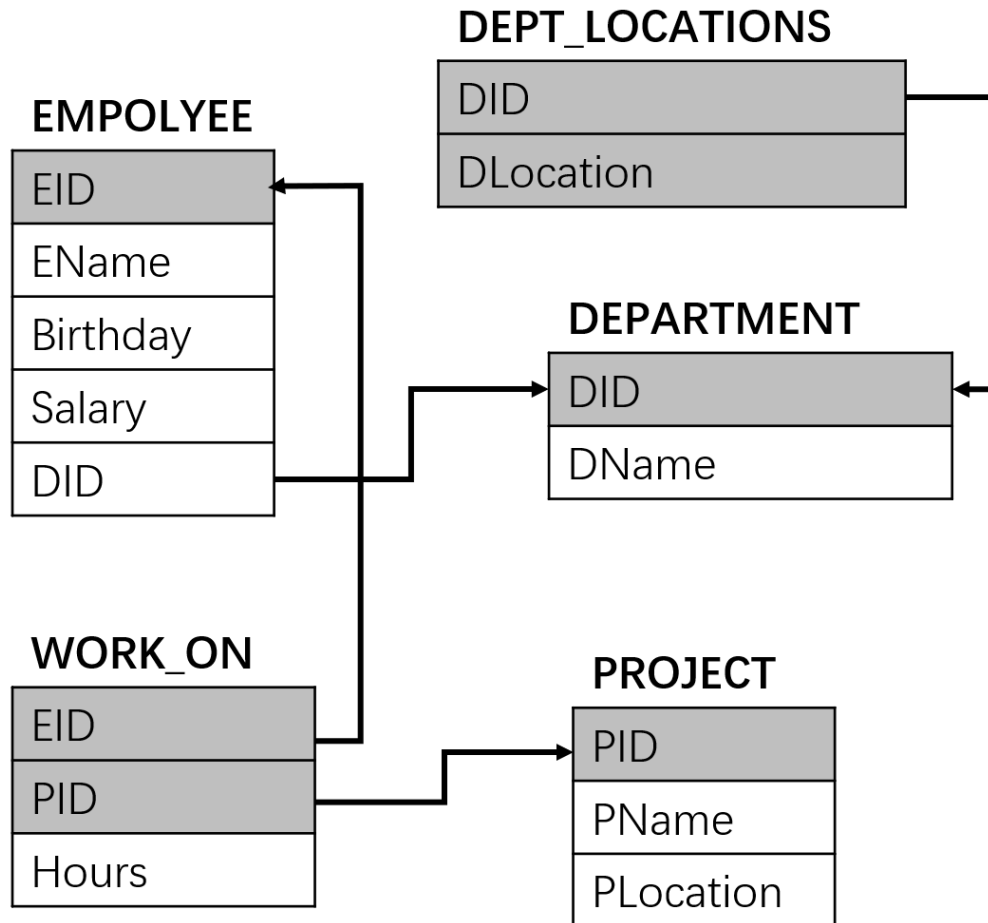


## COMP 5112. Lab 7: Relational Model

### Question 1.



Consider the COMPANY relation database schema shown above, which manages the employees, departments, and projects. Write relational algebra expressions for the following queries.

Hint: please use the natural join operator.

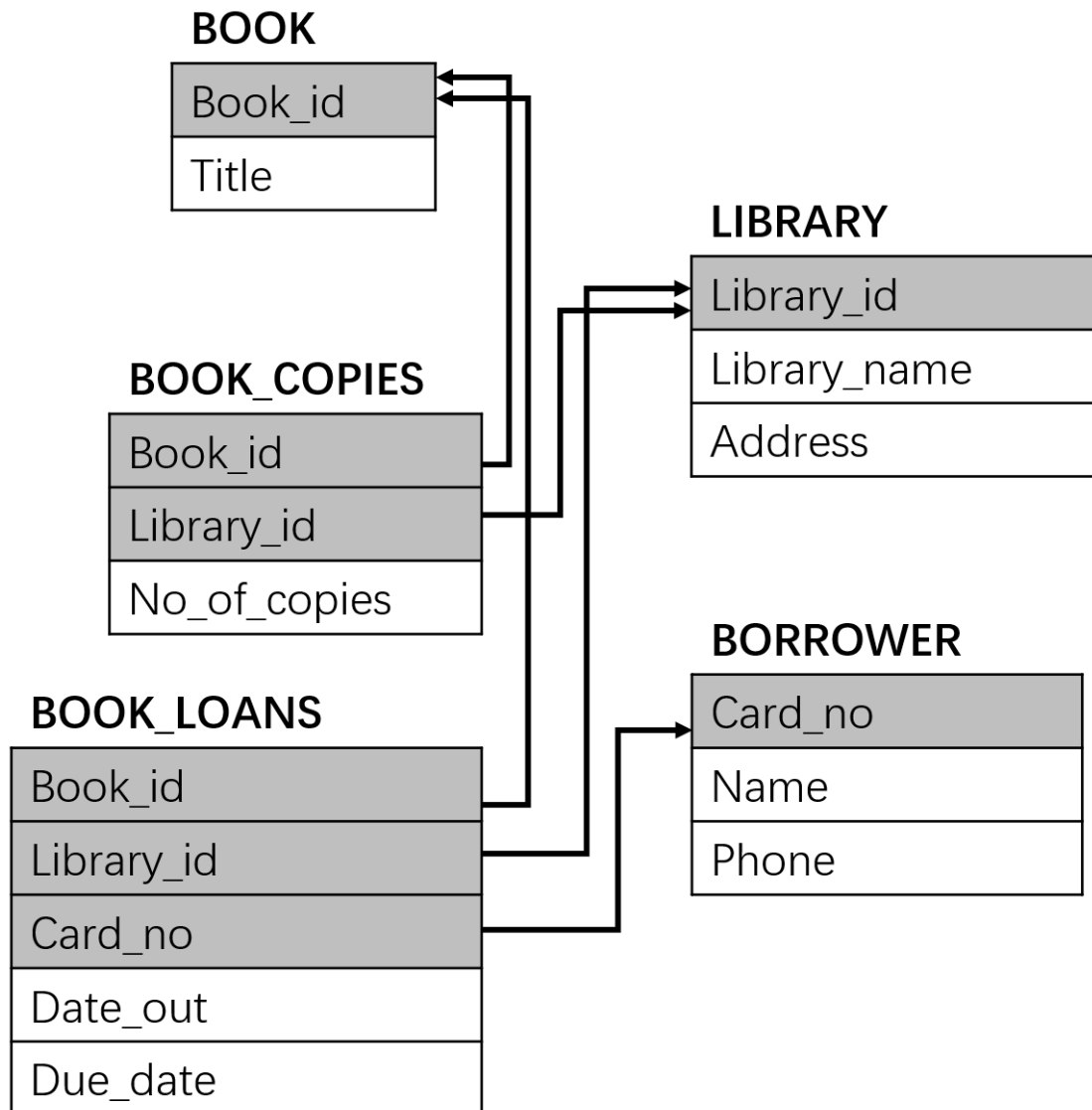
- Retrieve the names of all employees in department "COMP"
- Retrieve the names of all employees in department "COMP" who work on the "ProductX" project.

## Question 2

Consider the Supplier-Parts-Catalog schema: Suppliers(sid, sname, address), Parts(pid, pname, color) and Catalog(sid, pid, cost). State what the following query computes.

$\Pi_{\text{sname}} (\Pi_{\text{sid}} (\sigma_{\text{color}=\text{'red'}} (\text{Parts}) \bowtie \sigma_{\text{cost}<100} (\text{Catalog})) \bowtie \text{Suppliers})$

### Question 3



Consider the LIBRARY relation database schema, which is used to keep track of books, borrows, and book loans. Foreign key constraints are shown in the figure above. Write down relation algebra expressions for the following queries:

- (a) How many copies of the book titled “The Lost Tribe” are owned by the library whose name is “Sharpstown”?

(b) Retrieve the names of all borrowers who do not have any books checked out.