Question 6:

Consider the following expressions, which use the result of a relational algebra operation as the input to another operation. For each expression, explain in words what the expression does.

σ year ≥2009 (takes )  student

σyear ≥2009 (takes I student )

σID ,name ,course id (student I takes )

Solution :

1. finds all the students who have taken atleast one course since the year 2009 . It also displays the student information along with the course information.
2. It does the same as A(solution above) but here first natural join operation is done. After that those students are only selected who have take courses since 2009.
3. Finds the ID,name and course id of all the students who have taken atleast one course .

Question 9: Consider the bank database of Figure 2.15.

1. What are the appropriate primary keys?

Solution :

Considering that their cannot be duplicate tuples in the relation. otherwise customer name is not a good fit for primary key.

|  |  |
| --- | --- |
| **Table name** | **Primary Key** |
| Customer | Customer\_name |
| Branch | Branch\_name |
| Loan | Loan\_number |
| Account | Account\_number |
|  |  |

1. Given your choice of primary keys, identify appropriate foreign keys.

Solution :

|  |  |
| --- | --- |
| **Table name** | **Foreign Key** |
| Borrower | Customer\_name  Loan\_number |
| Depositor | Customer\_name  Account\_number |
| Loan | Branch\_name |
| Account | Branch\_name |
|  |  |

**2.13**Consider the bank database of Figure 2.15. Give an expression in the rela- tional algebra for each of the following queries:

* 1. A. Find all loan numbers with a loan value greater than $10,000.
  2. B. Find the names of all depositors who have an account with a value greater than $6,000.
  3. C. Find the names of all depositors who have an account with a value greater than $6,000 at the “Uptown” branch.

Solution :

A : π Loan\_number( σ amount ≥10000 (loan ) )

B: π Customer\_name( σ balance ≥6000 (account  depositor ) )

C : π Customer\_name( σ balance ≥6000  σ branch\_name = ‘Uptown’ (account  depositor ) )