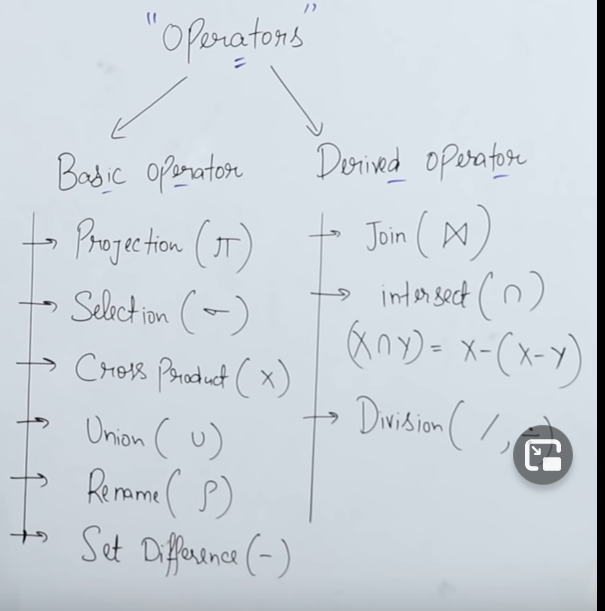
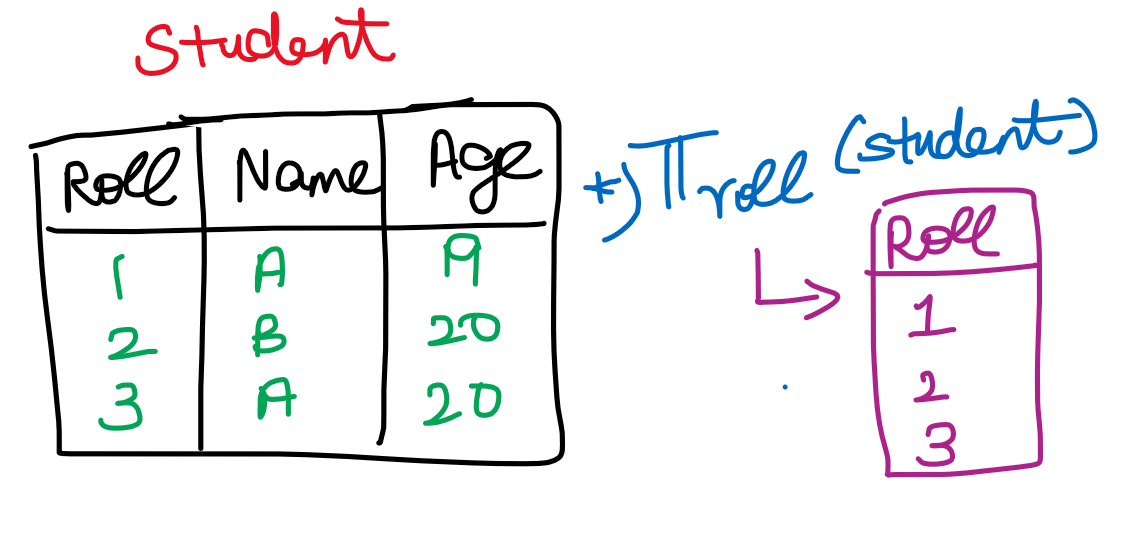
**Relational Algebra**

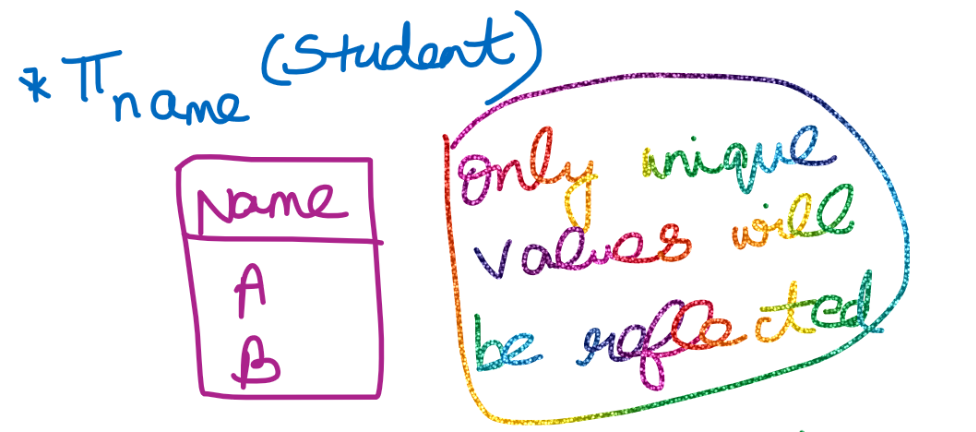
Relational algebra is a **procedural query language** (or) **formal query language**, which takes instances of relations as input and yields instances of relations as output. It uses operators to perform queries. An operator can be either **unary** or **binary**. They accept relations as their input and yield relations as their output. Relational algebra is performed recursively on a relation and intermediate results are also considered relations.

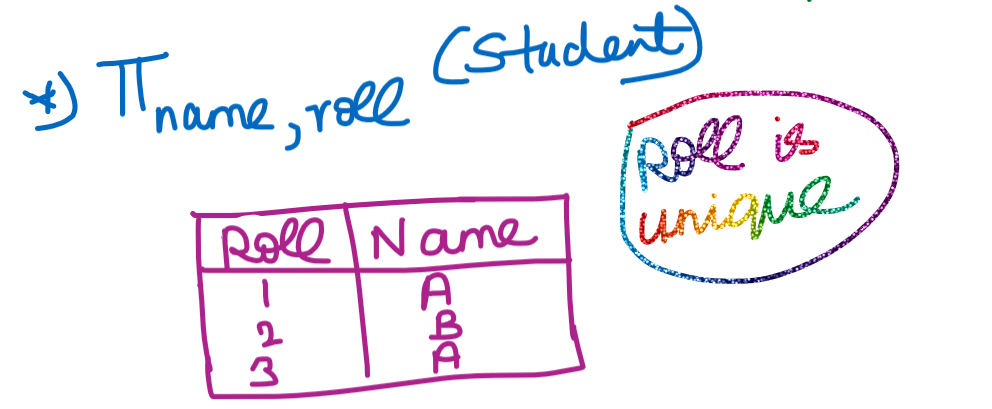


**Projection (**

**Selects a particular column**

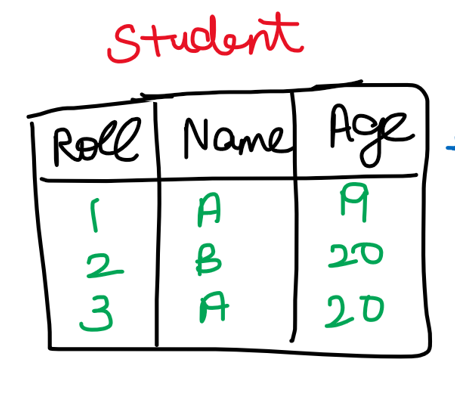


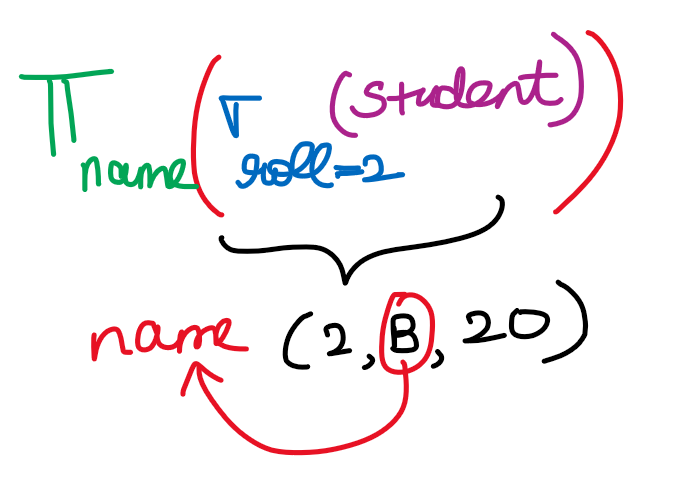




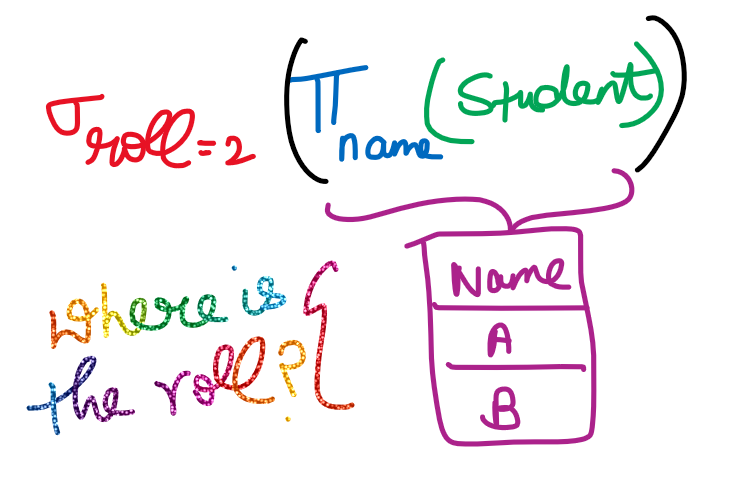
**Selection (**

**Selects a particular row(tuple)**

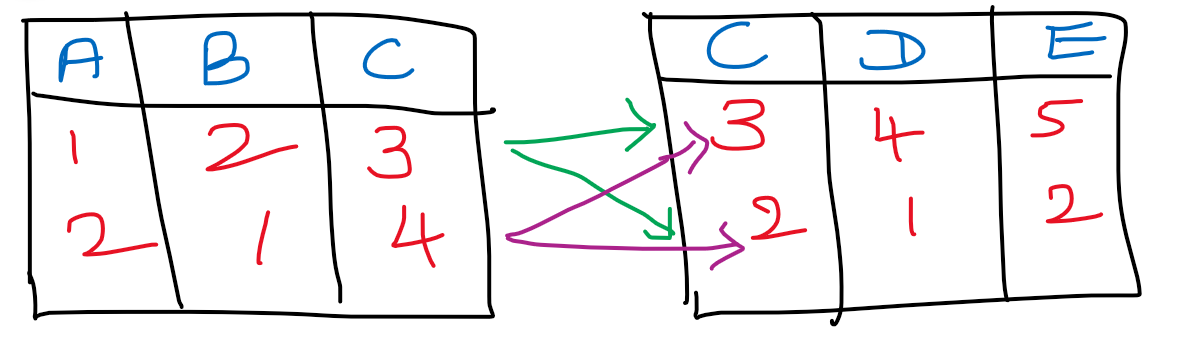


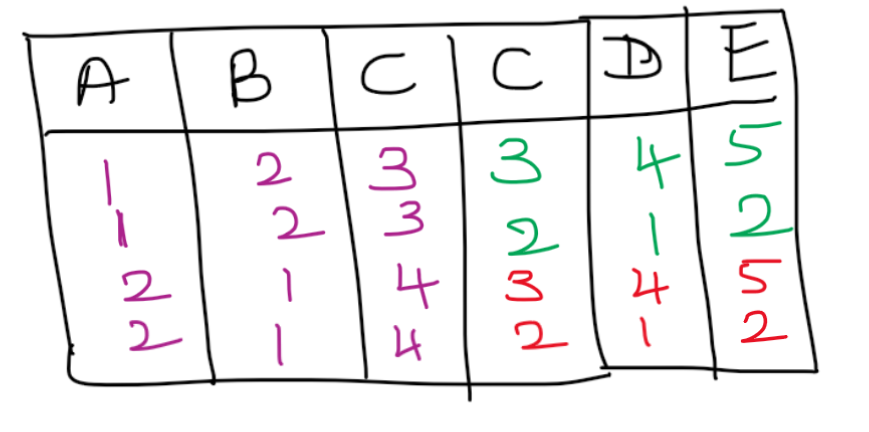
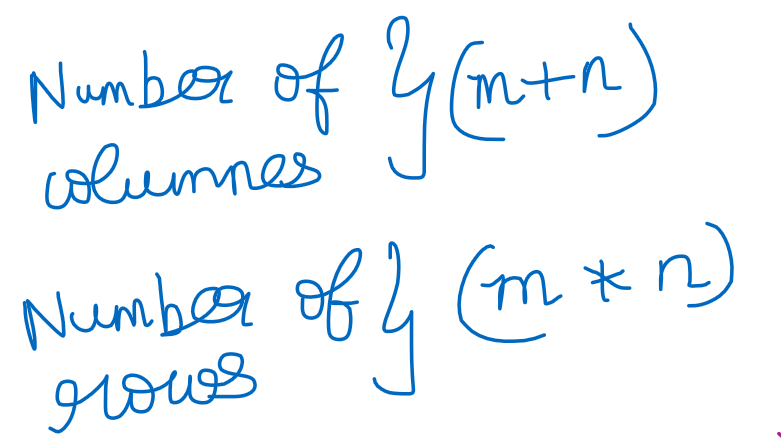
**Retrieve the name of the student whose roll no=2**

**Shifting projection and selection, what will happen ????**



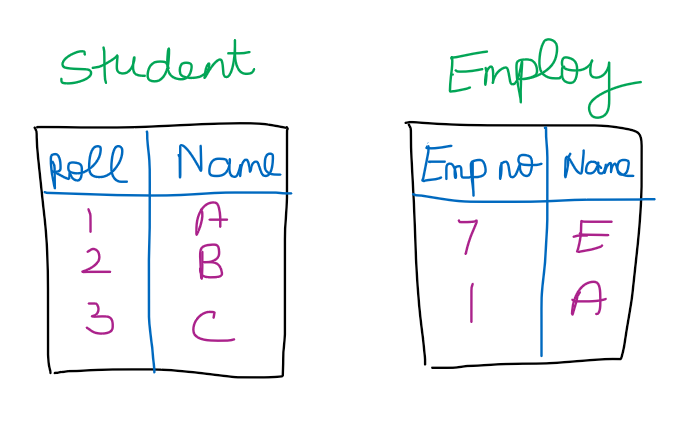
**Cross Product**

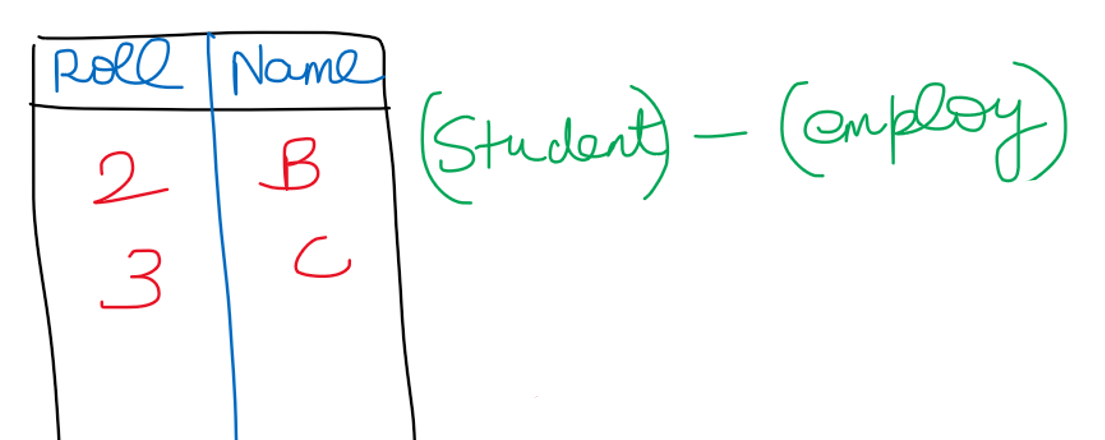


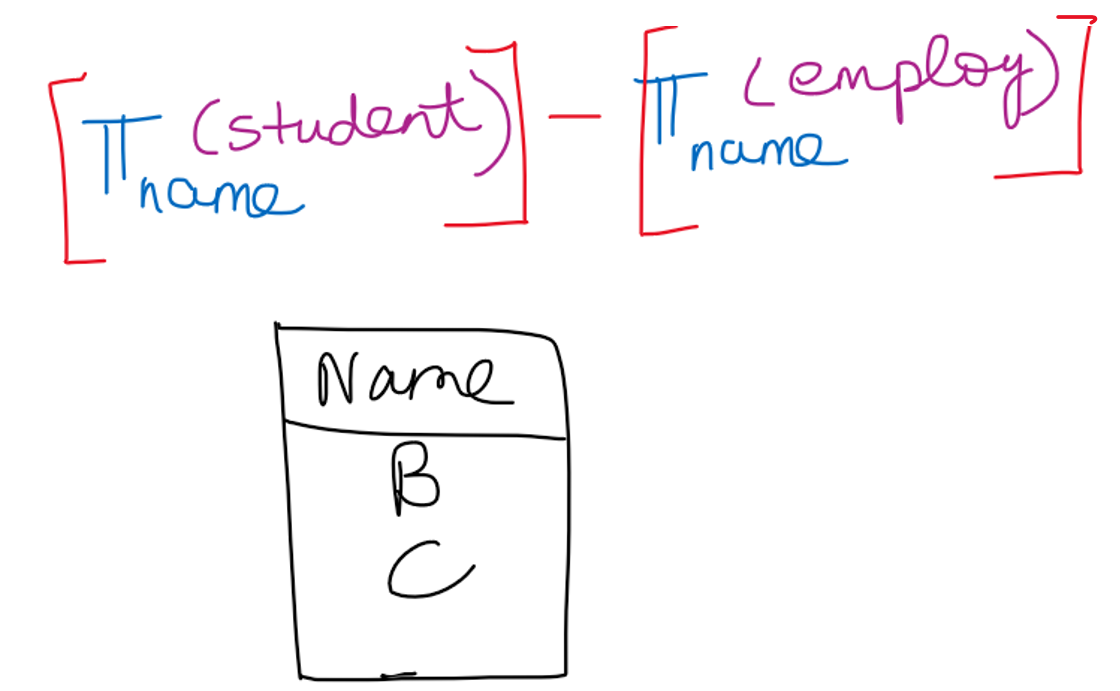


Here C column is repeated (since at-least one column should be common)

**Set Difference (-)**



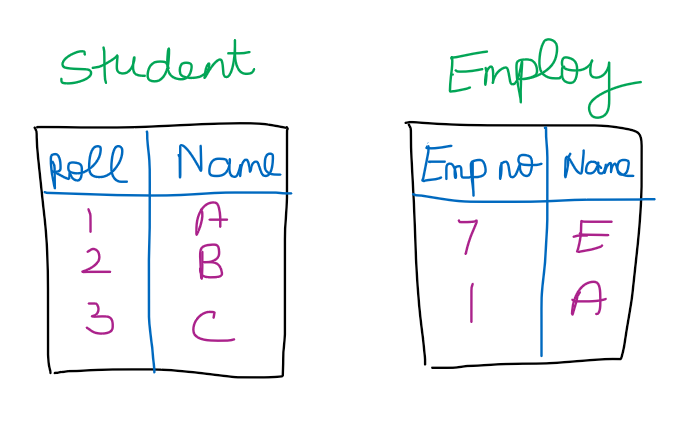


**Name of the person who is a student and but not an employ**

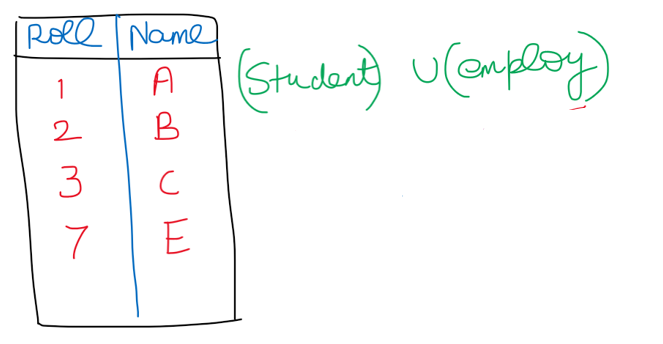
**Name of the person who is an employ and but not a student**

**Union**

Number of columns must be same.  
Domain of every column must be same.

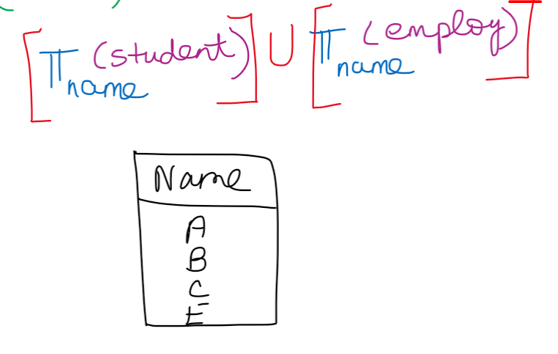


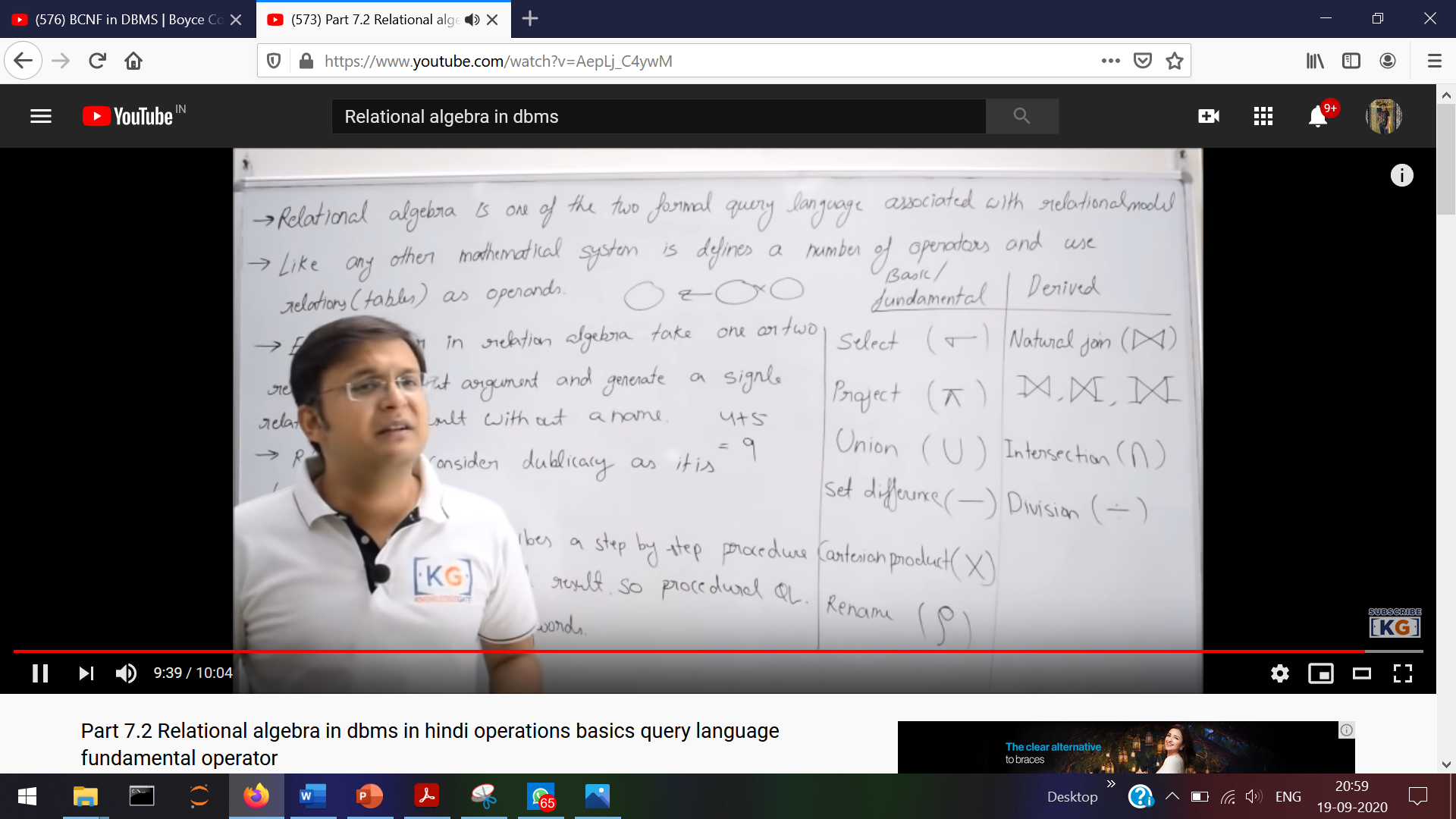
Union operation





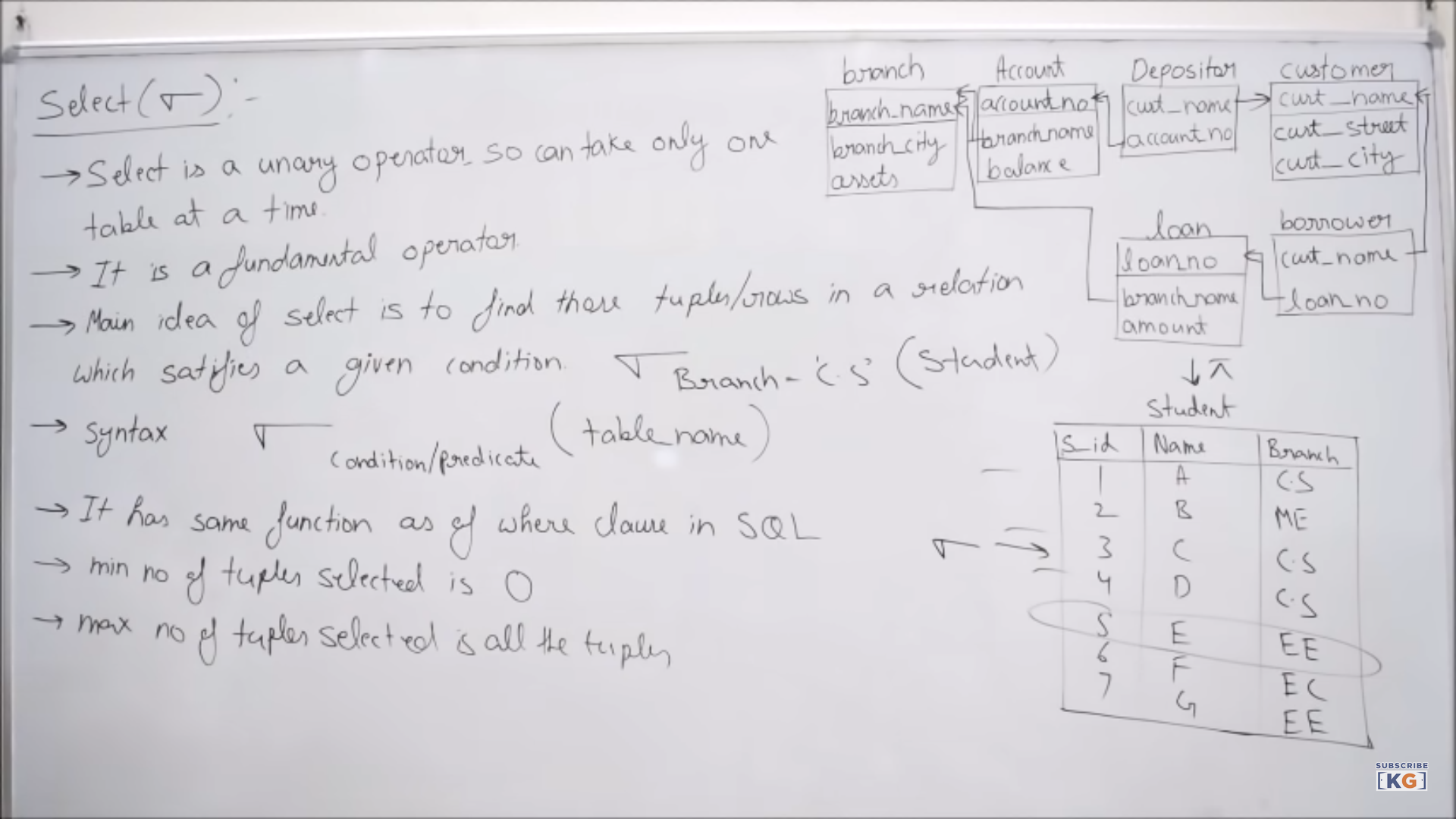
**Name of the student who is both employ and student**





**Select**



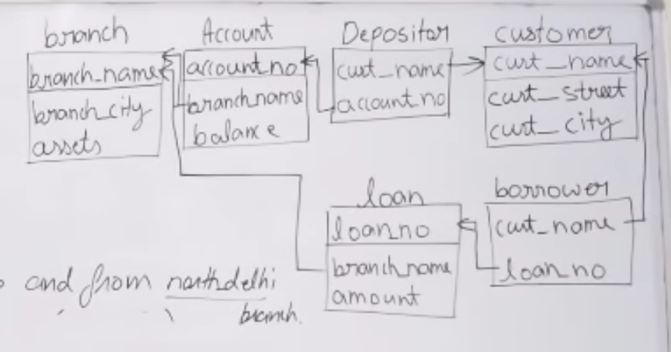




Minimum number of tuples selected 🡪 branch is ‘Civil’  
Maximum number of tuples selected 🡪 Sid <=7



**Practice question - 1**





**Find the details of accounts having balance greater than 1000??**

Balance>=1000 (account)



**Find the details of the customer who lives in Delhi??**

customer\_city=’Delhi’(customer)



**Find the details of the loans having amount<=5000 and from ‘North Delhi’ branch???**

amount<=5000 ( branch\_name=’North Delhi’ (loan) )



branch\_name=’North Delhi’ ( amount<=5000 (loan))



(loan)  
 branch\_name=’North Delhi’ amount<=5000



**Find the branch details which are in Delhi or having assests>=10,00,000???** (branch)  
 assets>=10,00,000 branch\_city=’Delhi’



**Projection**

**Find all the branch names of the bank????**

(branch) [ In account and loan table ‘branch\_name’ 🡪 foreign key]branch\_name



**Find all the account number along with the balance???**  (account)



account\_no,balance

**Find the names of all the customers who have loan??**

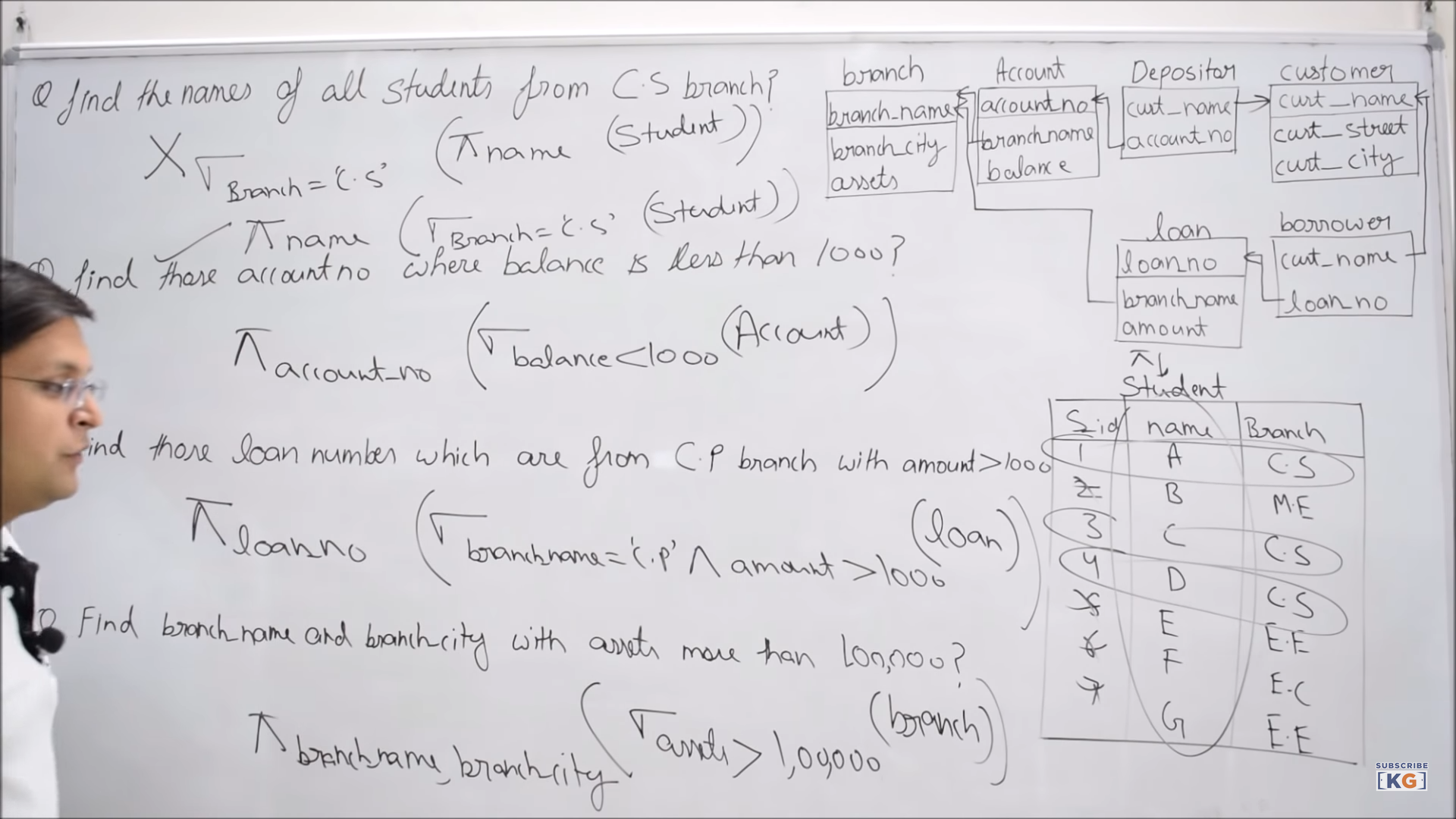
(borrower)  
 Customer\_name



**Find all the details about the branch???**

(branch) 🡪 It includes all the attributes along with all the rows of the branch

**Selection along with projection**



Why intersection is a derived attribute?????

