Relational Algebra: A formal query language based on a set of operations on relation

fundamental operation

- Select
- Project
- cartesian product
- union
- Set difference
- Rename

Additional operation

- Natural join
- Intersection
- Assignment
- Division / quotient
- θ - join

Above operations DOES NOT MODIFY the database/ record

SELECT operation (σ)

(*) Entire row satisfying cond$_i$ C_i

This is a unary operation defined on single relation

$$\sigma_{year=2016}(book)$$

$$\sigma_{C_i}(r)$$

↑

Show / select all the book records having publication year = 2016

$$\sigma_{ACCNO \geq 10000}(book)$$

10001 → Yes

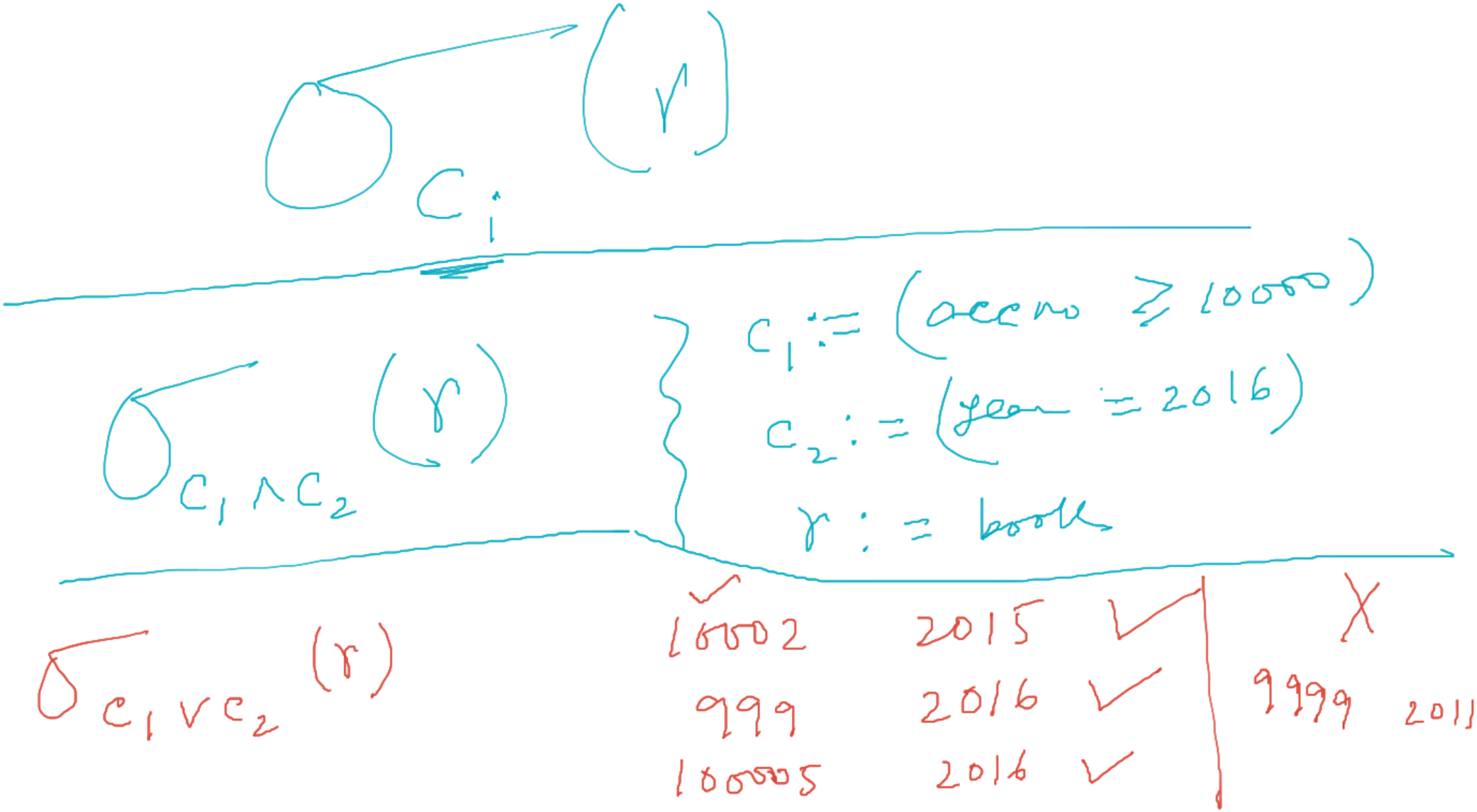
1009 → NO

$$\sigma_{(ACCNO \geq 10000) \wedge (year = 2016)}(book)$$

10009 2015 X

999 2016 X

100003 2016 ✓

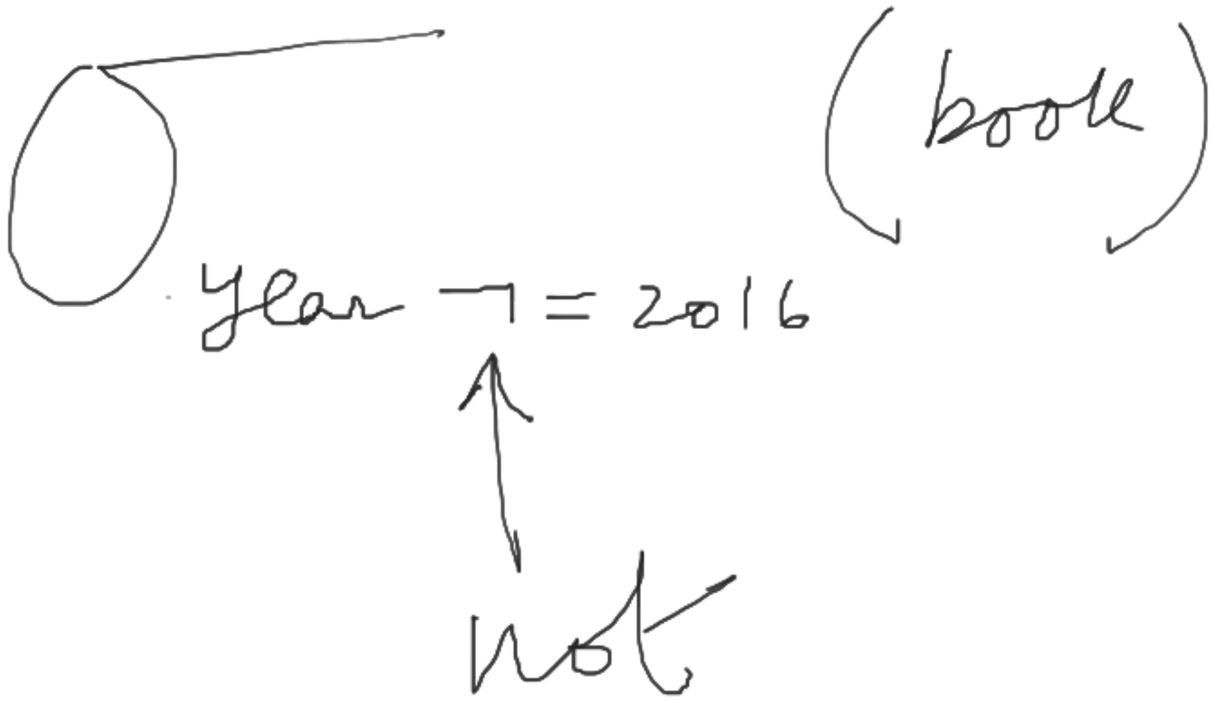

$\sigma_{c_i}(r)$
$\sigma_{c_1 \wedge c_2}(r)$
$\sigma_{c_1 \vee c_2}(r)$
$c_1 := (\text{accno} \geq 1000)$
$c_2 := (\text{year} = 2016)$
$r := \text{book}$
10002 2015
999 2016
100005 2016
X
9999 2011

$\sigma_{(title = 'DBMS') \wedge (year = 2020)}(book)$

SELECT ALL the books WHERE title is DBMS AND year of pub. is 2020 from book relation

Book

AccNo	Year	Title
1005	2020	DBMS
1012	2020	DBMS
~~1003~~	~~2016~~	~~DBMS~~


book
year ¬ = 2016
not