SET difference
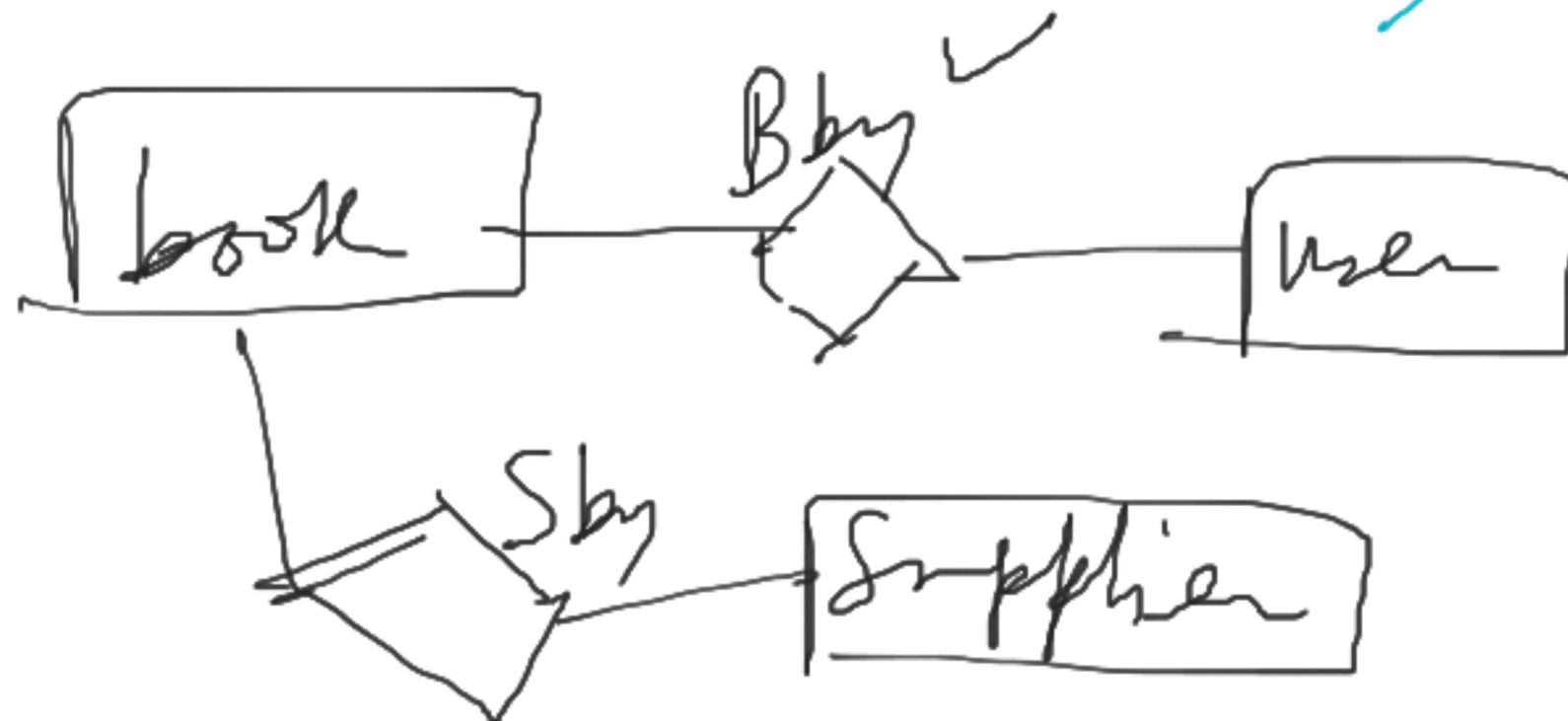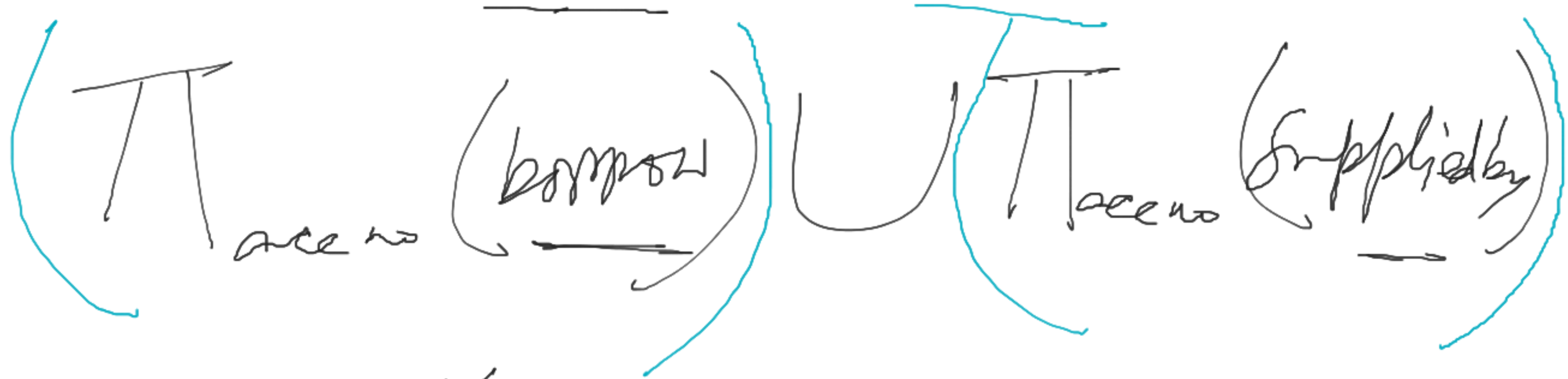
find acc no. of all books those are available in library

$$\Pi_{acc no}(book) - \Pi_{acc no}(borrow)$$

UNION operation

Find out all books those are either issued or have been supplied by a supplier

$$\left(\Pi_{acc\ no} \left(borrow \right) \right) \cup \left(\Pi_{acc\ no} \left(SuppliedBy \right) \right)$$

Intersection

r

A	B
a	1
b	3

s

A	B
a	1
b	2

$r \cap s$

A	B
a	1

$$r \cap s = r - (r - s)$$
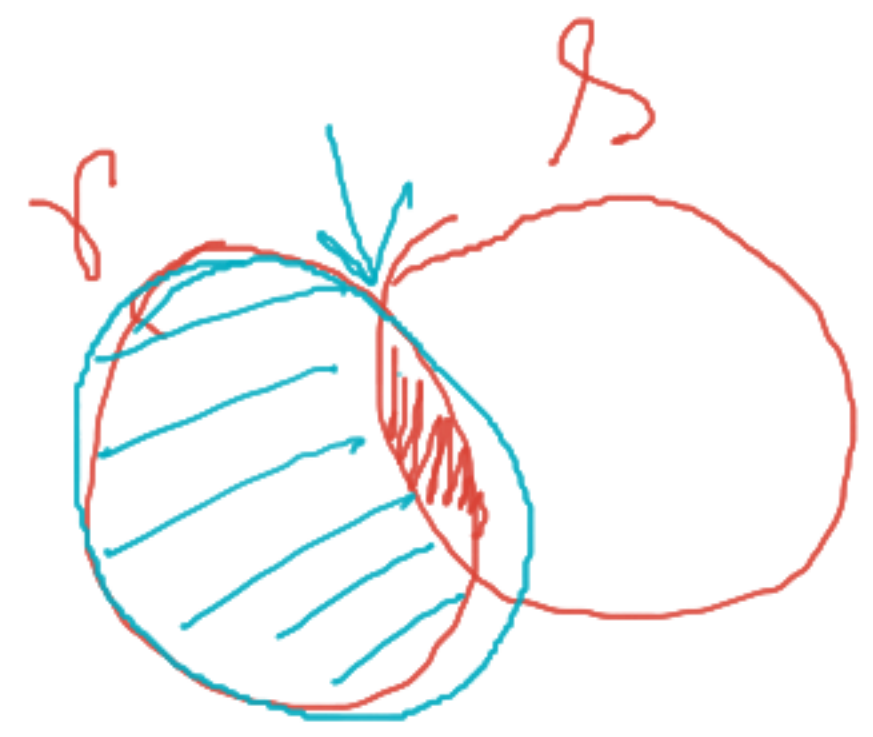
b	3

a	1

NATURAL JOIN operation ⋈

$r(R)$

A	B

S

$r(S)$

C	D

If no common element in R and S

$\Rightarrow$ if $R \cap S = \phi$

then $r \bowtie s = r \times s$

$r \bowtie s = (A, B, C, D)$

r (R)

A	B	C
a	b	c
d	e	f
g	h	i

s (S)

B	D
B	D
b	q
p	r
e	t

$$r \bowtie s$$

$$= \pi_{\substack{r.A, \\ r.B, \\ r.C, \\ s.D}} \left(\sigma_{r.B = s.B} \left(r \times s \right) \right)$$

$$\boxed{r \bowtie s} = r(R) \bowtie s(S) = r \bowtie s (R \cup S)$$

A	B	C	D
a	b	c	q
d	e	f	t

$$r \bowtie s = s \bowtie r$$

True / False

Example   book (Accno, Year, title)
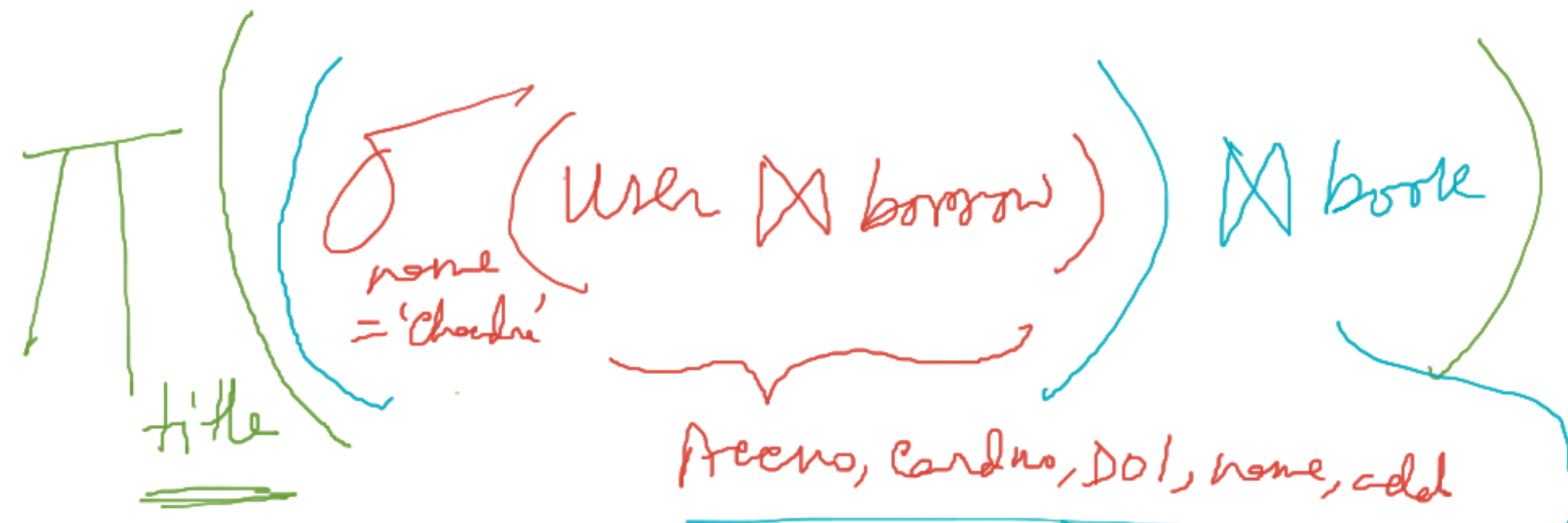   borrow (Accno, Cardno, DOI)
           user (cardno, bname, add)

book ⋈ borrow (Accno, Year, title, Cardno, DOI)

$\pi_{title} (\sigma_{Cardno = c001} (book ⋈ borrow))$

find out title of all books issued to card "c001"

⊗ find out the titles of all books issued to 'Chandra'

book (Accno , Year , title)
borrow (Accno, Cardno, DOI)
user (cardno , name, add)

$$\Pi_{title} \left(\left(\sigma_{name = 'Chandra'} \left(User \bowtie borrow \right) \right) \bowtie book \right)$$

Accno, Cardno, DOI, name, add

Accno, Cardno, DOI, name, add, Year, title

Accn	CNO	DOI	name	add
	-	-	Chandra	
			chandra	
			Chandra	

$$\Pi_{title}\left(\left(\sigma_{name=Chandra}(User \bowtie borrow)\right) \bowtie book\right) \rightarrow \textcircled{1}$$

OR

$$\Pi_{title}\left(\left(\sigma_{name='Chandra}(user) \bowtie borrow\right) \bowtie book\right) \rightarrow \textcircled{2}$$

OR

$$\Pi_{title}\left(\sigma_{name='Chandra}\left((user \bowtie book) \bowtie borrow\right)\right) \rightarrow \textcircled{3}$$

H.W.

$r(A, B, C)$

A	B	C
a	b	c
a	c	d
p	q	r

$s(B, C, D)$

B	C	D
r	A	t
b	c	m
q	r	s
b	r	m

$r \bowtie s$

A	B	C	D
a	b	c	m
p	q	r	s

book (Acc no, Year, title)
borrow (Acc no, card no, DOI)
user (card no, name, add)

$(($ user $\bowtie$ borrow $)$ $\bowtie$ book $)$
$\underline{\text{card no}}$
$\underline{ \text{Acc no}}$

SAME ⇅

$(($ user $\bowtie$ book $)$ $\bowtie$ borrow $)$
$\underline{ \times}$
$\underline{ \text{card no, Acc no}}$

$((r \bowtie s) \bowtie t) = r \bowtie (s \bowtie t) = (r \bowtie t) \bowtie s$
$ = r \bowtie (t \bowtie s) = (r \bowtie s \bowtie t)$

$$\Pi_{sname}\left(\sigma_{bname = 'Chandra'}\left(user \bowtie borrowby \bowtie supplier\right)\right)$$

find supplier name of those books have been issued to 'chandra'

NATURAL JOIN

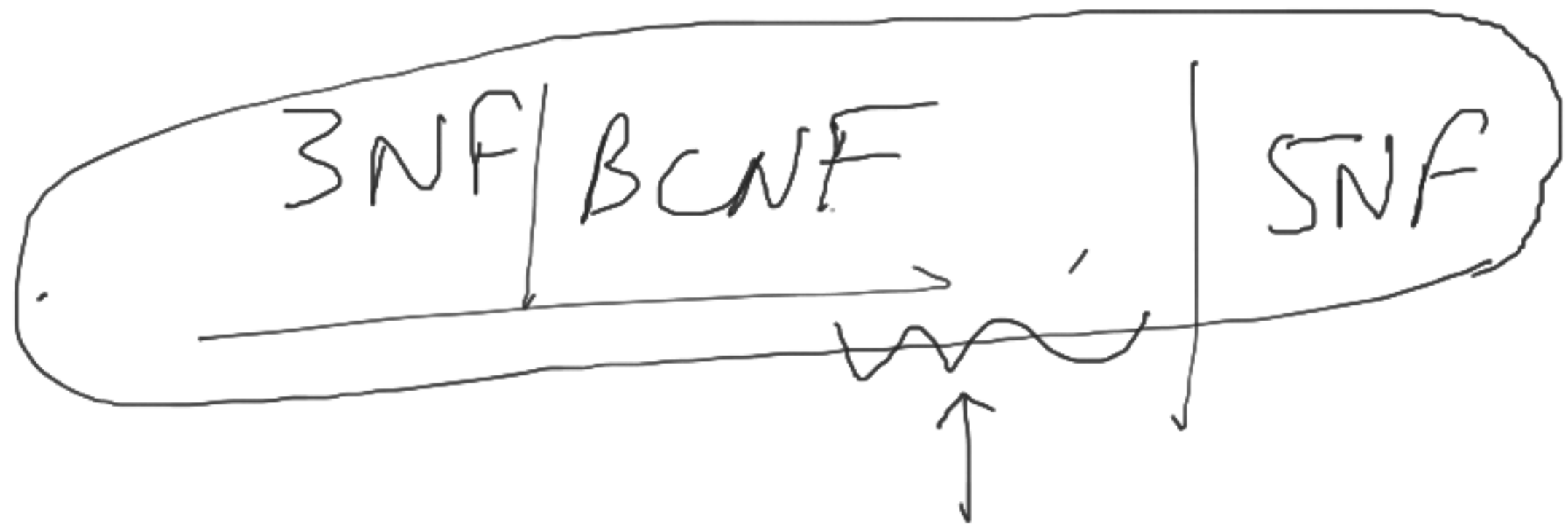let $r(R)$, $s(S)$ be relations and

let $R \cap S = \{A_1, A_2, \ldots, A_K\}$

$$r \bowtie s = \Pi_{R \cup S} \left(\sigma_{\substack{r.A_1 = s.A_1, \\ r.A_2 = s.A_2, \\ \vdots \\ r.A_K = s.A_K}} (r \times s) \right)$$

Excel sheet ⟶ & Link Shere with
                                    friends

Date	Link
080324	

NF

3NF | BCNF | 5NF

Quiz $\longrightarrow$ 4

Assign $\longrightarrow$ 4

$$(\gamma \bowtie t) \bowtie (s \bowtie t)$$

$$= \gamma \bowtie s \bowtie t$$

True/False

ABDEF c

γ

A	B

t

B	C	D

A B C D

s

D	E	F

B,E F $\longrightarrow$ ABCDEF