

Relational Algebra

r1		
a	b	c
1	1	1
1	2	4
2	0	3

r2	
a	d
1	1
0	1
2	1

r3		
c	d	e
1	1	0
4	1	1
2	1	0
2	3	3

r4		
a	b	c
1	1	0
1	2	2

1. $\pi_{[a,b]}(\sigma_{[b>1 \vee c=3]}r1) \cup \pi_{[a,b]}r4$
2. $\sigma_{[d=1]}r3 \times \pi_{[a]}r4$
3. $\pi_{[b,c]}(\sigma_{[c=3]}r1) \times \pi_{[a,b]}r4$
4. $\pi_{[a,c]}(r1 \cup r4)$
5. $\pi_{[d]}r3 * \sigma_{[(a=0 \vee a=2) \wedge d=1]}r2$
6. Compute the following join variants for $r1 * r2$
 - (a) left outer join
 - (b) right outer join
 - (c) full outer join
 - (d) union join
 - (e) semi join
 - (f) $r1 *_{[r1.a=r2.a \wedge b>1]} r2$
7. Compute the following join variants for $r2 * r3$
 - (a) left outer join
 - (b) right outer join
 - (c) full outer join
 - (d) union join
 - (e) semi join
8. $(\pi_{[d]}r3) \setminus (\pi_{[d]}r2)$
9. $\pi_{[a]}r2 * \sigma_{[c=2]}r3$

Relational Algebra and SQL

- Please translate the tables from above (schema and values) into a Postgresql database.
- Verify the results of the relational algebra exercise by executing the corresponding SQL queries on the Postgresql database..