[Q1: 5pts] Suppose relation R(A,B, C) has the following tuples:

A	B	C
3	3	2
6	4	3
2	4	1
3	5	1
7	1	2

and relation S(B,C,D) has the following tuples:

B	C	D
5	1	6
1	5	8
4	3	9

Compute the natural join of R and S. Show the schema of the result relation.

[Q2: 5pts] Suppose relation R(A,B) has the following tuples:

A	B
1	a
7	t
2	g
4	c
10	t

and relation S(B,C,D) has the following tuples:

B	C	D
c	5	6
a	7	8
t	8	9

Compute the theta-join of R and S with the condition R.B = S.B AND R.A > S.D. Show the schema of the result relation.

[Q3: 5pts] Consider a relation R(A,B) with r tuples, all unique within R, and a relation S(B,C) with s tuples, all unique within S. Let t represent the number of tuples in R natural-join S. What is the value range of t? What is the value of t for R natural-join R (assuming no null values in R)?

[Q4: 5pts] Suppose relation R(A,B,C) has the following tuples:

A	B	C
1	2	3
4	2	3
4	5	6
2	5	3
1	2	6

Compute the projection $\pi_{B,A}$ (R). Show the schema of the result relation.

[Q5: 12 pts] Suppose relation R(A,B,C) has the following tuples:

Relation R(A,B,C):

A	B	C
a	b	c
d	b	c
d	e	f
b	e	c
a	b	f

Relation S(A,B,C):

A	B	C
b	e	c
b	e	d
d	e	f
a	b	c

Union R ∪ S — schema (A, B, C):

A	B	C
a	b	c
d	b	c
d	e	f
b	e	c
a	b	f
b	e	d

Intersection R ∩ S — schema (A, B, C):

A	B	C
a	b	c
d	e	f
b	e	c

Difference R − S — schema (A, B, C):

A	B	C
d	b	c
a	b	f

Difference S − R — schema (A, B, C):

A	B	C
b	e	d