

COMP 3005
Assignment #2
Due: October 4

Instruction

1. This is an individual assignment. Copying is not allowed.
2. Submit your assignment as a single word/PDF document on [culearn](#).

Queries (20 marks)

Use Relational Algebra (ALG) to express the following queries based on the following suppliers-and-parts databases. Submit your algebra expressions for these queries as well as the query results.

Suppliers

<u>S#</u>	SNAME	STATUS	CITY
S1	Smith	20	London
S2	Jones	30	Paris
S3	Blake	30	Paris
S4	Clark	20	London
S5	Adams	30	Athens

Parts

<u>P#</u>	PNAME	COLOR	WEIGHT	CITY
P1	Nut	Red	12.0	London
P2	Bolt	Green	17.0	Paris
P3	Screw	Blue	17.0	Oslo
P4	Screw	Red	14.0	London
P5	Cam	Blue	12.0	Paris
P6	Cog	Red	19.0	London

SP

<u>S#</u>	<u>P#</u>	QTY
S1	P1	300
S1	P2	200
S1	P3	400
S1	P4	200
S1	P5	100
S1	P6	100
S2	P1	300
S2	P2	400
S3	P2	200
S4	P2	200
S4	P3	300
S4	P4	400
S4	P5	500
S4	P6	600

1. Get the part names that Adams provides.

```
T1 := select sname = 'Adams' (suppliers);  
T2 := (T1 njoin SP) njoin Parts;  
project pname (T2);
```

```
PNAME  
No result
```

2. Get supplier names for suppliers who supply part P2.

```
project sname (select p# = 'P2' (Suppliers njoin SP));
```

SNAME
Smith
Jones
Blake
Clark

3. Get supplier names and the total quantity of parts supplied.

```
aggregate SNAME, sum(QTY) (suppliers njoin SP);
```

SNAME	sum(QTY)
Smith	1300
Jones	700
Blake	200
Clark	2000

4. Get supplier names for suppliers who supply parts with quantity less than 300

```
project sname (select QTY < 300 (Suppliers njoin SP));
```

SNAME
Smith
Blake
Clark

5. Get supplier names for suppliers who supply either blue or green parts.

```
T1 := Suppliers njoin (SP njoin Parts));  
project sname(select color='Green' or color='Blue' (T1));
```

SNAME
Smith
Jones
Blake
Clark

6. Get supplier name/part name pairs such that the indicated supplier does not supply the indicated part.

```
T1 := project sname (Suppliers);  
T2 := project pname (Parts);  
T3 := T1 times T2;  
T4 := project sname, pname (Suppliers njoin (SP njoin Parts));  
T3 minus T4;  
SNAME      PNAME
```

Adams	Bolt
Adams	Cam
Adams	Cog
Adams	Nut
Adams	Screw
Blake	Cam
Blake	Cog
Blake	Nut
Blake	Screw
Clark	Nut
Jones	Cam
Jones	Cog
Jones	Screw

7. Get supplier names for suppliers who does not supply any parts.

```
T1 := project sname (Suppliers);
T2 := project sname (Suppliers njoin SP);
T1 minus T2;
```

```
SNAME
Adams
```

8. Get supplier names for suppliers who supply all parts.

```
T1 := project S#, P# (SP);
T2 := project P# (Parts);
T3 := T1 divideby T2;
project SNAME (T3 njoin Suppliers);
```

```
SNAME
Smith
```

9. Get supplier names for suppliers who supply all parts except P1.

```
T1 := project S#, P# (sp);
T2 := project P# (select P# != 'P1' (parts));
T3 := T1 divideby T2;
T4 := project S# (select P#='P1' (Suppliers njoin SP));
T5 := T3 minus T4;
project sname (Suppliers njoin T5);
```

Solution 2:

```
T1: = PROJECT S#, P# (SP);
T2: = PROJECT P# (parts);
T3: = T1 divideby T2;
```

```
T4: = PROJECT P# (SELECT P#!='P1' (parts));  
T5: = T1 divideby T4;  
PROJECT SNAME (T5 minus T3) njoin suppliers;
```

SNAME

CLARK

10. Get supplier names and the number of parts and total quantity supplied.

```
aggregate SNAME, count(p#), sum(QTY) (suppliers njoin SP);
```

SNAME	COUNT (P#)	SUM (QTY)
Smith	6	1300
Jones	2	700
Blake	1	200
Clark	5	2000