

## Lab1 CIS 3530 (Relational Algebra)

### Submission Instructions

- You must use the same notation of Relational Algebra that we have used in class and those used in the slides ( $\Pi$ ,  $\infty$ ,  $\div$ ,  $\sigma$ ,  $\times$ ,  $\cap$ ,  $\cup$ ,  $-$ ,  $\infty_{\text{left}}$  . . ) OR you may use the ones given in the relational algebra calculator.
- Your submission must be typed - handwritten lab submissions will not be marked. You may use any text editor of your choice to type in the answers. Submit using the dropbox for lab1 on moodle.
- Name the file to submit as lastnameFirstnameL1.txt (e.g. chaturvediRituL1.txt).

### Schema for this lab:

Assume that a tools company called GMT stores data on different parts they manufacture and on suppliers who supply these parts. The database is called SHIPMENT and consists of 3 tables (note that table names are case-insensitive for this lab).

**supplier (sno, sname, status, citys)**

**part (pno, pname, colour, weight, cityp)**

**shipment (sno, pno, qty)**

#### Integrity Constraints

- Primary Key of relation
  - SUPPLIER is sno
  - PARTS is pno
  - SHIPMENT is (sno, pno)
- Foreign key
  - sno in SHIPMENT references (sno) in SUPPLIER
  - pNo in SHIPMENT references (pno) in PARTS

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Relational Algebra queries are written using pen and paper. But there is an online relational calculator available for students to test their queries. You must follow the given steps to temporarily load a dataset that we will use for lab1 and worksheet1. This work by Johannes Kessler is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Relational algebra calculator link for SHIPMENT Database:

<https://dbis-uibk.github.io/relax/calc/gist/a7cb531d6dc1a3db7a99825bd893c642>

**Tip: When you complete a query successfully on the calculator, download it or copy it to a text editor before you start the next query.**

Write query in relational algebra to do the following. For each question, you must (a) write the query in relational algebra (b) show the resulting relation.

1. Get supplier names for suppliers who supply part P2.
2. Get supplier names for suppliers who do not supply part P2.
3. Get supplier names for suppliers who supply at least one blue part.
4. Get supplier names for suppliers who supply all blue parts.
5. Find names of all suppliers who supply both parts P1 and P2.
6. Find the max quantity supplied.
7. Find names of all suppliers who supply 2 parts.

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For convenience, the database instance is given below:

supplier				
sno	sname	status	citys	
S1	Henry	20	Guelph	
S2	Smith	10	London	
S3	Larka	20	Guelph	
S4	Adam	20	Guelph	
S5	Blake	30	Toronto	
S6	Arthur	10	London	
part				
pno	pname	colour	weight	cityp
P1	Bolt	Green	17	Montreal
P2	Bolt	Blue	17.5	Toronto
P3	Screw	Blue	14	London
P4	Can	Green	19	Montreal
P5	Nut	Red	13.9	Guelph
P6	Cog	Blue	14	Windsor

shipment		
sno	pno	qty
S1	P1	200
S2	P3	300
S2	P5	330
S3	P3	200
S3	P2	150
S3	P6	230
S4	P6	500
S5	P1	200
S5	P2	300
S5	P3	500
S5	P4	210
S5	P5	300
S5	P6	400