**LAB 4 – Relational Algebra** Tomas Gonzalez Ortega Arundeep Chohan

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Note: We both worked pretty hard specially trying to test the Relax application so please do not discount points for give the same file.

**Question 1**

1 πCNo ((STUDENT)⨝(ENROLLED))

2 πCNo (COURSE) - πCNo (ENROLLED)

3 πname,CName (ENROLLED⨝STUDENT⨝COURSE)

4 πStudID (σCName = 'Database Systems' ∨ CName = 'Analysis of Algorithms' (COURSE⨝STUDENT⨝ENROLLED))

5 πStudID (σCName = 'Database Systems' ∧ CName = 'Analysis of Algorithms' (COURSE⨝STUDENT⨝ENROLLED))

6 (πCName (COURSE) ⨝ (πStudID, CName (ENROLLED⨝COURSE))) ÷ (πStudID (ENROLLED))

7 π CName ( σ major = 'COMP' (COURSE⨝STUDENT⨝ENROLLED))

group: this is terrible

STUDENT = {

StudID:number, name:string, address:string, gender:string, major:string

1 , 'Shuang' , 'whatever 1' , 'Feminine' , 'COMP'

2 , 'Ayako' , 'whatever 2' , 'Feminine' , 'b'

3 , 'Rene' , 'whatever 3' , 'Masculine' , 'c'

4 , 'Aarundeep', 'whatever 4' , 'Masculine' , 'd'

5 , 'Tom' , 'whatever 5' , 'Masculine' , 'e'

}

COURSE = {

CNo:number, CName:string

11 , 'whatever a'

22 , 'whatever b'

33 , 'whatever c'

44 , 'Analysis of Algorithms'

55 , 'Database Systems'

}

ENROLLED = {

StudID:number, CNo:number

1 , 11

2 , 22

3 , 33

4 , 44

5 , 55

}

**Quention 2**

1) π Fname,Lname ( σ Hours > 10 ∧ Dno = 5 (EMPLOYEE⨝WORKS\_ON⨝PROJECT))

2) π Fname,Lname ( σ Super\_ssn = 333445555 (EMPLOYEE))

Note:  
First one is the one we use to get the Franklin Wong SSN and the second is to get the SSN of the people supervised by Franklin Wong.  
π Essn ( σ Fname ='Franklin' ∧ Lname = 'Wong' (EMPLOYEE))

π Essn ( σ Super\_ssn = 333445555 (EMPLOYEE))

3) πPname,Hours (Pno γ (SUM Hours (WORKS\_ON⨝PROJECT))) According to page 261 of the book (watching example 2).

Maybe like this?  
π Pname,Hours (γ Pno, Hours; sum(WORKS\_ON)->x ( PROJECT ))

4) π Fname,Lname ( σ Hours = NULL (EMPLOYEE⨝WORKS\_ON⨝PROJECT))

5) π Dname (DEPARTMENT) ⨝ AVG (Salary)(EMPLOYEE)   
This didn’t work in the relational algebra calculator (Relax) but is just a syntax issue with the software. We’re positive about the idea because it looks similar than another examples.

6) π AVG (salary) ( σ sex = 'F' (EMPLOYEE))

7) π Fname,Lname,Address ( σ Plocation = 'Houston'(EMPLOYEE⨝WORKS\_ON⨝PROJECT)) - π Fname,Lname,Address ( σ Dlocation ≠ 'Houston' (EMPLOYEE⨝DEPT\_LOCATIONS))

8) π Lname (π Mgr\_ssn (DEPARTMENT⨝DEPENDENT⨝EMPLOYEE) - π Essn (DEPARTMENT⨝DEPENDENT⨝EMPLOYEE))

π Mgr\_ssn (DEPARTMENT⨝DEPENDENT) - π Essn (DEPARTMENT⨝DEPENDENT) We know this one works and this get the Ssn of the department manager and in the top we tried to get the name in the Relax software but we got a syntax issue.