Fall 2017	CSC 365: Database Systems	Emilia E. Buckalew

Homework 1

Due dates:

MWF section: negotiable, hopefully Friday, October 6, 11:59 a.m. (i.e. noon)
TR section: negotiable, hopefully Saturday, October 7, 11:59 a.m. (i.e. noon)

Instructions:

You must put your answers on a separate sheet of paper, written legibly and with adequate spacing so that I can easily determine what your answer is.

Problem 1 *Consider the following relations:*

R:

A	B	C
b	*c*	*3*
c	*c*	*3*
c	*a*	*3*
b	*b*	*1*
c	*a*	*4*
b	*a*	*2*

S:

A	B	C
c	*c*	*2*
c	*a*	*3*
b	*b*	*1*
a	*b*	*3*
b	*c*	*3*
a	*a*	*1*
c	*c*	*3*

T:

B	D	E	F
a	*a*	*1*	*2*
c	*d*	*2*	*4*
b	*b*	*3*	*2*
d	*b*	*3*	*2*
a	*a*	*2*	*3*
b	*c*	*4*	*1*
d	*a*	*1*	*4*

W:

C	D
1	*a*
2	*b*
3	*c*
4	*d*

For each of the following queries: (1) compute the answer, (2) draw the query tree.

a. $R \cap S$

b. $S - R$

c. $R - S$

d. $\pi_{A,B}(S)$

e. $\pi_{B,C}(R) \cup \pi_{B,C}(S)$

f. $\pi_{A,B}(R) - \pi_{A,B}(S)$

g. $\pi_C(W) \times \pi_A(S) \times \pi_B(T)$

h. $\sigma_{E>F}(T)$

i. $\sigma_{A \neq B}(R)$

j. $\pi_{B,F}(\sigma_{F \geq E}(T))$

k. $\sigma_{A=D \vee B=D}(\pi_{A,B}(R) \times W)$

l. $\sigma_{A=b \wedge C>1}(R) \cup \sigma_{B=b \vee C \neq 3}(S)$

m. $\sigma_{\neg(B=d)}(T)$

n. $\pi_{A,B,R.C,D}(\sigma_{R.C=W.C}(R \times W))$

o. $W \bowtie R$

p. $W \bowtie_{R.C=W.C} R$

q. $T \bowtie_{F>C} W$

r. $R \bowtie S$

s. $R \bowtie_{R.B=S.A} S$

t. $(R \bowtie T) \bowtie \pi_{A,C,D}(S \bowtie W)$

u. $\pi_{T1.D,T2.B}(\rho_{T1}(T) \bowtie_{T1.D=T2.B} \rho_{T2}(T))$

v. $\pi_{B,D,E}(\sigma_{F \leq C}(T \bowtie W))$

w. $\pi_{A,B}(R \bowtie_{R.C \neq S.C} S) \bowtie \sigma_{D=a}(T)$

x. $\pi_A(\pi_B(\pi_C(R \cup S)))$

y. $\sigma_{A \neq a}(S) \bowtie \sigma_{D \neq c}(W)$

z. $\sigma_{C=1}(R) \bowtie \sigma_{C=2}(S)$