**CSCI 5333.3 DBMS**

**Suggested Solution for HW #3**

(1) For example:

1. π SCITY( SUPPLIER |X| SUPPLY |X| ( π PNUM (σ COLOR = ‘Green’ (PART))))
2. π SNUM(σ Quantity>3 (SUPPLY |X| ( π PNUM (σ COLOR = ‘Green’ (PART))))
3. π SNUM, PNUM (SUPPLY))/ ( π SNUM (σ SSCITY = ‘Houston’ (SUPPLIER)))
4. π PNAME (PART |X| SUPPLY |X|π SNUM (σ STATUS > 4 (SUPPLIER)))

(2) For example:

1. PROJECT [SCITY] (SUPPLIER JOIN SUPPLY JOIN (SELECT [COLOR='Green'] (PART)));
2. PROJECT [SNUM] (SELECT [QUANTITY > 3] (SUPPLY JOIN (SELECT [COLOR='Green'] (PART))));
3. (PROJECT [PNUM] (SUPPLY))

MINUS

(PROJECT [PNUM]

(((PROJECT [SNUM] (SELECT [SCITY='Houston'] (SUPPLIER)))

TIMES

(PROJECT [PNUM] (SUPPLY)))

MINUS

(PROJECT [SNUM, PNUM] (SUPPLY))));

1. PROJECT [PNUM]  
   ((SELECT [STATUS > 4] (SUPPLIER))

JOIN

SUPPLY

JOIN

PART);

(3) For example:

1. {(S.CITY) | S ϵ SUPPLIER , U ϵ SUPPLY, P ϵ PART, S.SNUM = U.SNUM, U.PNUM = P.PNUM, P.COLOR=’Green’}
2. {(S.SNUM) | S ϵ SUPPLY, P ϵ PART, S.PNUM = P.PNUM, S.QUANTITY>3, P.COLOR=’Green’}
3. {(U.PNUM) | U ϵ SUPPLY, ~ (Ǝ S) (S ϵ SUPPLIER, S.SCITY = ‘Houston’, ~ (Ǝ U2) ( U2 ϵ SUPPLY, U2.SNUM = S.SNUM, U2.PNUM = U.PNUM)) }
4. {({P.PNUM) | S ϵ SUPPLIER , U ϵ SUPPLY, P ϵ PART, S.SNUM = U.SNUM, U.PNUM = P.PNUM, P.STATUS>4}

(4) For example:

1. { (SCITY) | (SNUM, \_ , SCITY, \_ ) ϵ SUPPLIER, (SNUM, PNUM, \_ ) ϵ SUPPLY, (PNUM, \_, ‘Green’, \_) ϵ PART }
2. { (SNUM) | (SNUM, PNUM, QUANTITY ) ϵ SUPPLY, (PNUM, \_, ‘Green’, \_ ) ϵ PART , QUANTITY > 3}
3. { (PNUM) | (\_, PNUM, \_ ) ϵ SUPPLY, ~ (Ǝ SNUM ) ( (SNUM, \_, ‘\_, \_ ) ϵ SUPPLIER, (SNUM, PNUM, \_ ) ∉ SUPPLY ) }
4. { (PNUM) | (SNUM, \_ , \_, STATUS ) ϵ SUPPLIER, (SNUM, PNUM, \_ ) ϵ SUPPLY, (PNUM, \_, \_, \_) ϵ PART, STATUS > 4}