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CS 1555/2055

Assignment 3

1. (a) |a| = 1 because the query is projecting only the machine\_name; |r(a)| = 6 because there are 6 tuples in the TICKETS relation

(b) |b| = 12 because the natural join will add the arities of the individual relations, minus duplicates; |r(b)| = 12 because all tuples in ASSIGNMENT will correspond to a tuple in TICKETS, since ASSIGNMENT.ticket\_number is a foreign key for TICKETS.ticket\_number

(c) |c| = 13 because left outer join does duplicate attributes with the same name; |r(c)| = 12 because ASSIGNMENT.ticket\_number is a foreign key for TICKETS.ticket\_number, meaning that all of the tuples in ASSIGNMENT will be part of the join

2. (a) **Π***fname, lname*(**σ***expertise = ‘hardware’* (TECH\_PERSONNEL))

(b) **ƒ*count*(σ***location = ‘SENSQ’* (INVENTORY))

3. (a) HS 🡨 **σ***status = ‘assigned’* (ASSIGNMENT)

IS 🡨 HS ⋈HS.tech\_pplSoft = TECH\_PERSONNEL.pplSoft TECH\_PERSONNEL

JS 🡨 **σ***fname = ‘Bob’* ∧ *lname = ‘Hoffman’* (IS)

KS 🡨 JS \* TICKETS

RSLT 🡨 **Π***ticket\_number, owner\_pplSoft, date\_submitted, date\_closed, days\_worked\_on, category\_id, machine\_name, description* (KS)

(b) (Assuming that the wording of the question means that only users who submitted a ticket in Dec 2019 should be listed – also assuming that the tickets are numbered sequentially so the highest number is the most recent one)

HS 🡨 **σ***date\_submitted >= ‘01-DEC-2019’ ∧ date\_submitted <= ’31-DEC-2019’* (TICKETS)

RSLT 🡨 *owner\_pplSoft, ticket\_number***ƒ *MAX(ticket\_number)* (HS)**

**(c)**

**HS 🡨 σ***date\_submitted >= ‘01-FEB-2019’ ∧ date\_submitted <= ’28-FEB-2019’* (TICKETS)

IS 🡨 *owner\_pplSoft* **ƒ *COUNT(owner\_pplSoft)* (HS)**

**JS 🡨 σ***COUNT(owner\_pplSoft) > 5* (IS)

KS 🡨 JS ⋈JS.owner\_pplSoft = USERS.pplSoft USERS

RSLT 🡨 **Π***fname, lname*(KS)

(d) HS 🡨 **σ***status = ‘closed\_successful’* (ASSIGNMENT)

IS 🡨 *owner\_pplSoft* **ƒ*COUNT(owner\_pplSoft)* (HS)**

**JS 🡨 *owner\_pplSoft, COUNT(owner\_pplSoft)* ƒ *MAX(COUNT(owner\_pplSoft))* (IS) (Here I’m using COUNT(owner\_pplSoft) to refer to the attribute name after the previous operation)**

**KS 🡨 JS** ⋈JS.tech\_pplSoft = TECH\_PERSONNEL.pplSoft TECH\_PERSONNEL

RSLT 🡨 **Π***fname, lname*(KS)

(e) HS 🡨 **Π***ticket\_number, machine\_name, date\_submitted*(TICKETS)

IS 🡨 **σ***(date\_submitted >= ‘01-JUN-2019’ ∧ date\_submitted <= ’30-JUN-2019’) ∨ (date\_submitted >= ‘01-AUG-2019’ ∧ date\_submitted <= ’31-AUG-2019’)* (HS)

JS 🡨 *machine\_name* **ƒ *COUNT(machine\_name)* (IS)**

**KS 🡨** *machine\_name* **ƒ *MAX(COUNT(machine\_name))* (JS)**

**RSLT(‘Device Name’) 🡨 Π***machine\_name* (KS)

(f) HS 🡨 **Π***ticket\_number, tech\_pplSoft*(ASSIGNMENT)

IS 🡨 HS \* TICKETS  
 JS 🡨 **Π***ticket\_number, tech\_pplSoft, category\_id* (IS)

KS 🡨 *tech\_pplSoft, category\_id***ƒ*COUNT(category\_id)* (JS)**

**LS 🡨 KS \* CATEGORIES  
 RSLT 🡨 Π***tech\_pplSoft, category, description*(LS)

(g) HS 🡨 **σ***date\_submitted >= ‘01-SEP-2019’ ∧ date\_submitted <= ’30-SEP-2019’* (TICKETS)

IS 🡨 **Π***owner\_pplSoft, category\_id* (HS)

JS 🡨 *owner\_pplSoft* **ƒ*COUNT(owner\_pplSoft)***

**LS 🡨 *owner\_pplSoft* ƒ*MAX(COUNT(owner\_pplSoft))***

**MS 🡨 LS** ⋈LS.owner\_pplSoft = USERS.pplSoft USERS

**RSLT 🡨 Π***fname, lname, pittID* (MS)