1DV503/1DT903 Database Technology and Modeling

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***Assignment 2***

**Task 1:**

**A.**

{Manufacturer,serial number} -> Model, Batch, Capacity, Retailer  
**B.**  
Model number -> manufacturer  
**C.**  
Batch -> Model

**Task 2:**

The relation is in 1NF because it has a primary key that uniquely identifies each  
record and it doesn’t contain any multivalued or nested relations. But the relation is not in 2NF or 3NF because it contains an attribute that is not dependent on the whole primary key, for example the commission is only dependent on the salesperson. And for the relation to be 3NF it must first be in 2NF and it is not allowed to have a nonkey attribute dependent on another nonkey attribute, but the discount is dependent on the date\_sold attribute which leads to it not being 3NF.   
  
To normalize it completely you first need to make it 2NF by splitting it into two different relations, CAR\_SALE\_1(Car,Date\_sold,Discount) and CAR\_SALE\_2(Car,Salesperson, Commission).  
To normalize it into 3NF we split the CAR\_SALE\_2 into two new relations, CAR\_SALE\_3(Car,Salesperson) and COMMISSION(Salesperson, commission).  
With these relations all attributes are fully dependent on the primary key of each relation and no transitive dependencies exist. Thus, the relation is 3NF.

**Task 3:**

**A.**

Query:

SELECT fname,lname

FROM EMPLOYEE AS E

INNER JOIN WORKS \_ON AS W ON E.ssn = W.essn

INNER JOIN PROJECT AS P ON W.pno = P.pnumber

WHERE P.pname = ‘computerization’;

Output:

En bild som visar text

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**B.**

Query:

SELECT pnumber,dnumber,lname,address,bdate  
FROM PROJECT AS P  
INNER JOIN DEPARTMENT AS D ON P.dnum = D.dnumber  
INNER JOIN EMPLOYEE AS E ON D.mgrssn = E.ssn  
WHERE plocation='Houston';

Output:

**En bild som visar bord

Automatiskt genererad beskrivning**

**C.**

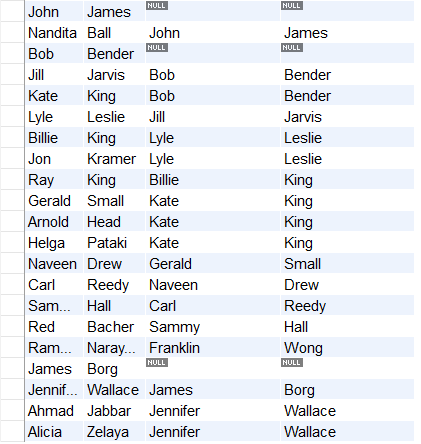
Query:

SELECT E.fname,E.lname,S.fname as supervisor\_fname,S.lname as supervisor\_lname  
FROM EMPLOYEE AS E  
LEFT JOIN EMPLOYEE AS S ON E.superssn = S.ssn;

Output:

**En bild som visar bord

Automatiskt genererad beskrivning**

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**D.**

Query:

SELECT \*  
FROM EMPLOYEE  
WHERE address LIKE '%Atlanta, GA';

Output:

**En bild som visar text, bord

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**E.**

Query:

SELECT \*  
FROM EMPLOYEE  
WHERE MONTH(bdate)='11'

Output:

En bild som visar text, bord

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**F.**

Query:

SELECT dname, AVG(E.salary) as average\_salary  
FROM EMPLOYEE AS E  
INNER JOIN DEPARTMENT AS D ON E.dno = D.dnumber  
GROUP BY D.dname;

Output:

**En bild som visar text

Automatiskt genererad beskrivning**

**G.**

Query:

SELECT fname,lname  
FROM EMPLOYEE AS E  
LEFT JOIN WORKS\_ON AS W ON E.ssn = W.essn  
WHERE W.essn IS NULL;

Output:

**En bild som visar bord

Automatiskt genererad beskrivning**

**H.**

Query:

SELECT fname,lname  
FROM EMPLOYEE AS E  
INNER JOIN WORKS\_ON AS W ON E.ssn = W.essn  
INNER JOIN PROJECT AS P ON W.pno = P.pnumber  
INNER JOIN DEPARTMENT AS D ON E.dno = D.dnumber  
WHERE D.dnumber = '5' AND E.salary > '30000' AND P.pname = 'ProductZ';

Output:

En bild som visar bord

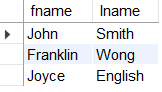
Automatiskt genererad beskrivning

**I.**

Query:

SELECT fname,lname  
FROM EMPLOYEE AS E  
INNER JOIN DEPARTMENT AS D ON E.dno = D.dnumber  
WHERE E.address LIKE '%Houston, TX%' AND D.mgrssn = '333445555';

Output:



**J.**

Query:

SELECT fname,lname  
FROM EMPLOYEE AS E  
INNER JOIN DEPARTMENT AS D ON E.dno=D.dnumber  
WHERE D.dnumber = (  
SELECT dno  
    FROM EMPLOYEE  
    GROUP BY dno  
    ORDER BY MAX(salary) DESC  
    LIMIT 1  
);

Output:



**K.**

Query:

SELECT dnumber,dname,COUNT(ssn)  as num\_employees  
FROM EMPLOYEE AS E  
INNER JOIN DEPARTMENT AS D ON E.dno = D.dnumber  
GROUP BY D.dnumber,D.dname  
HAVING AVG(E.salary) > '30000';

Output:

**En bild som visar bord

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**L.**

Query:

SELECT dependent\_name,relationship  
FROM DEPENDENT AS DE  
INNER JOIN EMPLOYEE AS E ON DE.essn = E.ssn  
WHERE E.superssn = '333445555'  
ORDER BY DE.dependent\_name ASC;

Output:

**En bild som visar bord

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