

Topgyal Gurung  
CSCI 43500-02  
HW-3  
October 20, 2018

**HW3: Organize information for printed circuit boards and complex electronics.**

**Design a database given this description for the EPA and the FIRM**

**Write a SQL based report to list those chips, pcbs and product that are not compliant and identify the violation.**

**make up an EPA and Firm database data.**

---

Electronic- IC chip or PCB. PCB is assembly of chips. Each device one or more PCBs.

Toxic material on Process or product :

For process, it is WASTE

For product, it is RESIDUAL AMOUNT

### **EPA AND FIRM**

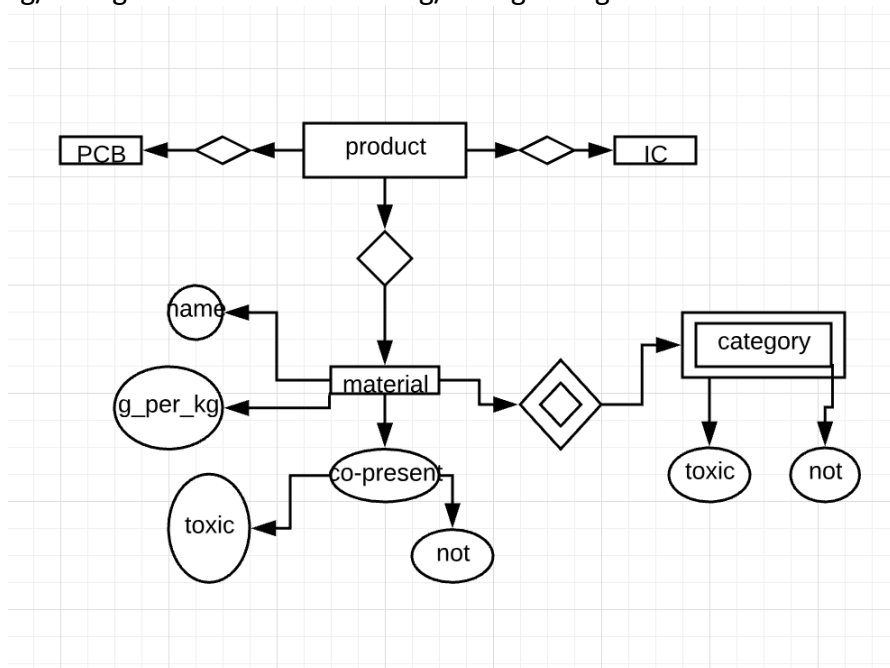
#### **Database for EPA:**

material\_name varchar (4) eg. Hg, As

category- toxic or non-toxic

g\_per\_kg is the limit of material per product

i.e 0.0001g/1000g for Arsenic and 0.001 g/1000g for hg



### SQL:

- Create database EPA;
- Create table product(name varchar(6), category varchar(6), g\_per\_kg int);
- 

Eg: To create the EPA database with data

- Insert into product( name, category, g\_per\_kg) values (Hg, toxic, 0.001);
- Insert into product( name, category, g\_per\_kg) values (As, toxic, 0.0001);
- Insert into product( name, category, g\_per\_kg) values (H2O, toxic, 50);
- insert into product( name, category,amt\_per\_product) values( 'copper', 'not',100 );
- insert into product(name, category,amt\_per\_product) values( 'silicon', 'not',500 );

➤MariaDB [EPA]> select \*from product;

material	category	amt_per_product
mercury	toxic	0.001
As	toxic	0.0001
h2o	toxic	50
copper	not	100
silicon	not	500

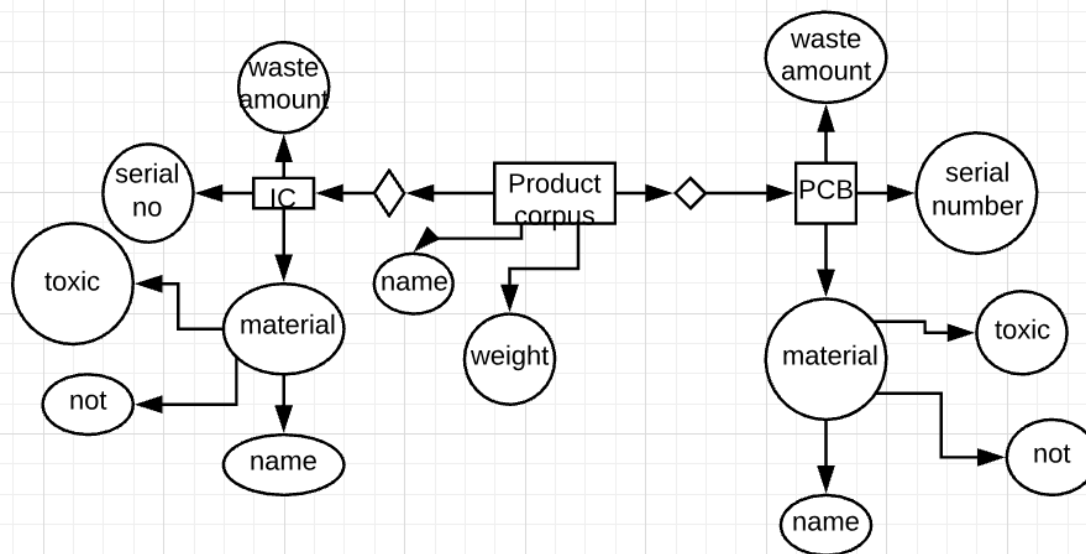
So the table product will contain material name, whether it is toxic or not and limit amount g per product weight)

We should also create table that shows limit amount of any toxic material individually present in the product or process and co-present with toxic and non-toxic.

### Database for FIRM:

Product corpus contains all chips and products required to make product

Each chip and pcb contains all toxic material and corpus maintains estimated amount of waste



Write a SQL based report to list those chips, pcbs and product that are not compliant and identify the violation.

- Create database firm;
- Create table product( name varchar (8), type var(4), weight\_in\_g int);
- insert into product (name,type weight)values("xpro", "all", 2000);
- insert into product (name,type weight)values("jet", "not", 300);

Not compliant: > select name from product where type= "not";

```

➤ +-----+
➤ | name |
➤ +-----+
➤ | p2   |
➤ +-----+
  
```

- create table IC(serial\_no int, material varchar(4),type varchar(4), waste\_amt\_in\_gram int);
- insert into IC(serial\_no,material,type,waste\_amt\_in\_gram)values(14,'h20','toxic',30);
- insert into IC(serial\_no,material,type,waste\_amt\_in\_gram)values(21,'As','toxic',0.005);
- insert into IC(serial\_no,material,type,waste\_amt\_in\_gram)values(55,'hg','toxic',0.95);

Not compliant: >

material
As
hg

- create table PCB(serial\_no int, material varchar(4),type varchar(4), waste\_amt\_in\_gram int);
- insert into PCB(serial\_no,material,type,waste\_amt\_in\_gram)values(14,'h20','toxic',60);
- insert into PCB(serial\_no,material,type,waste\_amt\_in\_gram)values(21,'As','toxic',0.0001);
- insert into IC(serial\_no,material,type,waste\_amt\_in\_gram)values(55,'hg','toxic',0.002);

Not compliant:

material
h20
hg

List of product that are not compliant

- product with one toxic material exceed limit amount with other toxic material
- product with one toxic material exceed limit amount with other non-toxic material
- product with toxic material does not satisfy g per kg limit.

List of chips and pcbs that are not compliant

- with not all material toxic
- does not satisfy estimated amount of waste