

- -00Database Systems: Homework #1 Solution

1.

(a)

```
CREATE TABLE Product (  
    maker CHAR(30),  
    model INT,  
    type CHAR(15),  
    PRIMARY KEY (model)  
);
```

(b)

```
CREATE TABLE PC (  
    model INT,  
    speed FLOAT,  
    ram INT,  
    hd INT,  
    price INT,  
    PRIMARY KEY (model)  
);
```

(c)

```
CREATE TABLE Laptop (  
    model INT,  
    speed FLOAT,  
    ram INT,  
    hd INT,  
    screen FLOAT,  
    price INT,  
    PRIMARY KEY (model)  
);
```

2.

(a)

$$\pi_{model}(\sigma_{speed \geq 3.00}(PC))$$

(b)

$$\pi_{maker}(\sigma_{hd \geq 100}(Product \bowtie Laptop))$$

(c)

$$\pi_{model, price}(\sigma_{maker='B'}(PC \cup Laptop \cup Printer \bowtie Product))$$

3.

(a)

$$\sigma_{speed < 2.00 \text{ AND } price > 500}(PC) = \emptyset$$

(b)

$$\sigma_{screen < 15.4 \text{ AND } hd < 100 \text{ AND } price \geq 1000}(Laptop) = \emptyset$$

(c)

$$Relation\ R := Product \bowtie PC$$

$$Relation\ S := Product \bowtie Laptop$$

$$\pi_{maker}(R) \cap \pi_{maker}(S) = \emptyset$$