CS 336 HW2
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1.Write SQL statements to create the relevant tables described by the following ER diagram. Your statements should specify an appropriate data type for each field and include key constraints.

```
CREATE TABLE Employee (
  id INT PRIMARY KEY,
  name VARCHAR(50) NOT NULL,
  age INT NOT NULL,
  salary DECIMAL(10, 2) NOT NULL
);

CREATE TABLE Department (
  id INT PRIMARY KEY,
  name VARCHAR(50) NOT NULL,
  budget DECIMAL(10, 2) NOT NULL
);

CREATE TABLE Works_In (
  employee_id INT NOT NULL,
  department_id INT NOT NULL,
  percent_time DECIMAL(3, 2) NOT NULL,
  PRIMARY KEY (employee_id, department_id),
  FOREIGN KEY (employee_id) REFERENCES Employee(id),
  FOREIGN KEY (department_id) REFERENCES Department(id)
);
```

2. A)

```
SELECT DISTINCT Suppliers.name
FROM Suppliers
JOIN Catalog ON Catalog.sid = Suppliers.id
JOIN Parts ON Catalog.pid = Parts.id
WHERE Parts.color = 'red';
```

B)

```
SELECT DISTINCT Suppliers.id
FROM Suppliers
LEFT JOIN Catalog ON Catalog.sid = Suppliers.id
LEFT JOIN Parts ON Catalog.pid = Parts.id
WHERE Parts.color = 'red' OR Suppliers.address = '123 College Ave.';
```

C)

```
SELECT Catalog.sid
FROM Catalog
JOIN Parts ON Catalog.pid = Parts.id
WHERE Parts.color IN ('red', 'green')
GROUP BY Catalog.sid
HAVING COUNT(DISTINCT Parts.color) = 2;
```

D)

```
SELECT Catalog.sid
FROM Catalog
JOIN Parts ON Catalog.pid = Parts.id
WHERE Parts.color = 'red' OR Parts.color = 'green'
GROUP BY Catalog.sid
HAVING COUNT(DISTINCT Parts.color) = 1;
```

E)

```
SELECT Catalog.pid
FROM Catalog
JOIN Parts ON Catalog.pid = Parts.id
JOIN Suppliers ON Catalog.sid = Suppliers.id
WHERE Suppliers.name = 'Toshiba'
AND Catalog.cost = (SELECT MAX(cost) FROM Catalog WHERE sid = Suppliers.id);
```

3. A)

```
SELECT DISTINCT Students.name
FROM Students
JOIN Takes ON Students.id = Takes.sid
JOIN Classes ON Takes.cname = Classes.name
JOIN Profs ON Classes.pid = Profs.id
WHERE Profs.name = 'Marie Curie' AND Students.level = 'JR';
```

B)

```
SELECT DISTINCT Classes.name
FROM Classes
LEFT JOIN Takes ON Classes.name = Takes.cname
WHERE Classes.room = 'Tillett 232' OR (SELECT COUNT(*) FROM Takes WHERE
Takes.cname = Classes.name) >= 5;
```

C)

```
SELECT DISTINCT Profs.name
FROM Profs
JOIN Classes ON Profs.id = Classes.pid
WHERE NOT EXISTS (
   SELECT DISTINCT room
   FROM Classes
   WHERE NOT EXISTS (
      SELECT *
      FROM Classes AS C
      WHERE C.pid = Profs.id AND C.room = Classes.room
   )
);
```

D)

```
SELECT level, AVG(age)
FROM Students
GROUP BY level;
```

E)

```
SELECT Profs.name, COUNT(*) as total_classes
FROM Profs
JOIN Classes ON Profs.id = Classes.pid
WHERE NOT EXISTS (
   SELECT *
   FROM Classes AS C
   WHERE C.pid = Profs.id AND C.room != 'Tillett 232'
)
GROUP BY Profs.name;
```