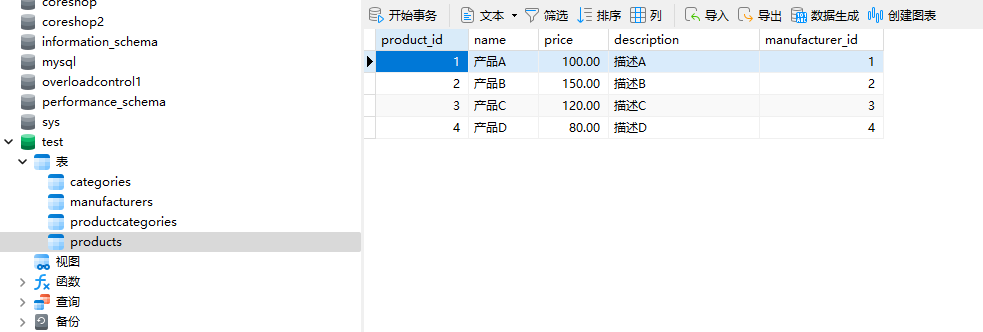
**表结构设计**

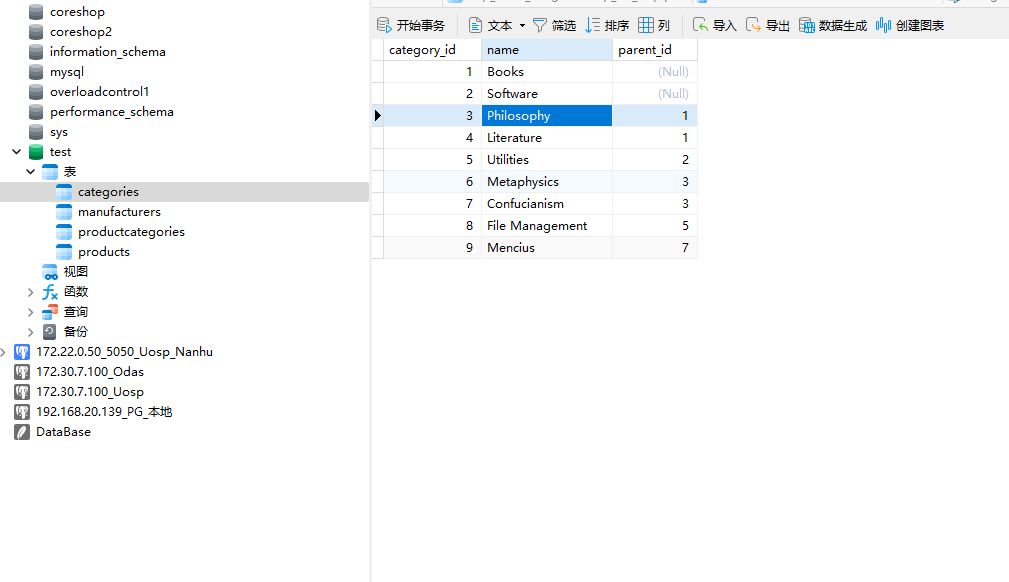
产品表（Products）

| **列名** | **数据类型** | **约束条件** |
| --- | --- | --- |
| product\_id | INT | PRIMARY KEY, AUTO\_INCREMENT |
| name | VARCHAR(255) | NOT NULL |
| price | DECIMAL(10,2) | NOT NULL |
| description | TEXT |  |
| manufacturer\_id | INT | FOREIGN KEY REFERENCES Manufacturers(manufacturer\_id) ON DELETE SET NULL |



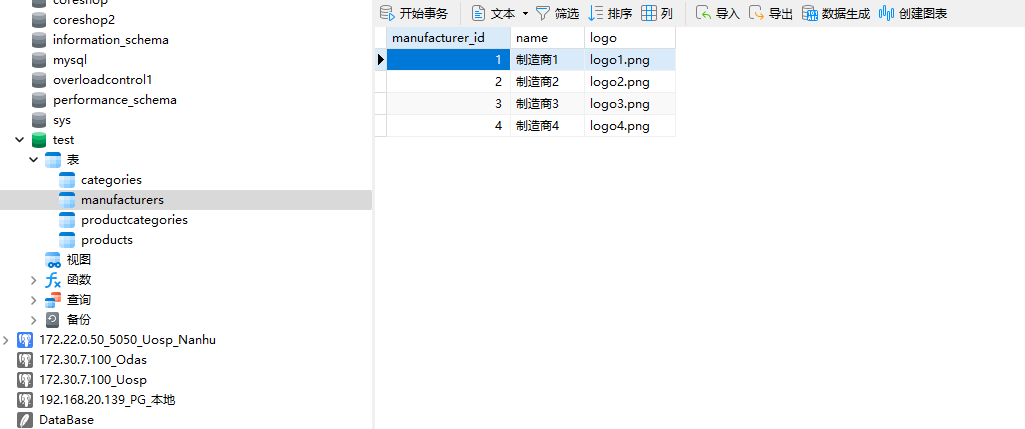
分类表（Categories）

| **列名** | **数据类型** | **约束条件** |
| --- | --- | --- |
| category\_id | INT | PRIMARY KEY, AUTO\_INCREMENT |
| name | VARCHAR(255) | NOT NULL |
| parent\_id | INT | FOREIGN KEY REFERENCES Categories(category\_id) ON DELETE CASCADE, NULLABLE |



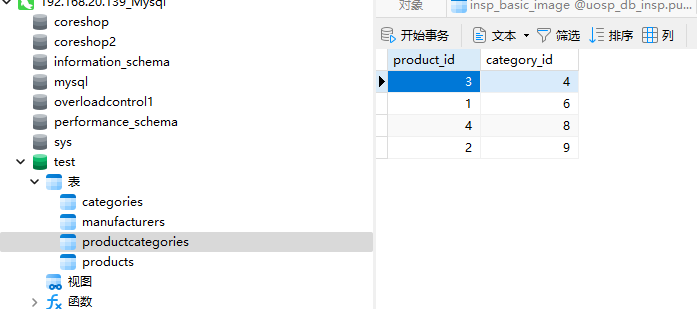
制造商表（Manufacturers）

| **列名** | **数据类型** | **约束条件** |
| --- | --- | --- |
| manufacturer\_id | INT | PRIMARY KEY, AUTO\_INCREMENT |
| name | VARCHAR(255) | NOT NULL |
| logo | VARCHAR(255) |  |



产品-分类关联表（ProductCategories）

| **列名** | **数据类型** | **约束条件** |
| --- | --- | --- |
| product\_id | INT | FOREIGN KEY REFERENCES Products(product\_id) ON DELETE CASCADE, PRIMARY KEY (product\_id, category\_id) |
| category\_id | INT | FOREIGN KEY REFERENCES Categories(category\_id) ON DELETE CASCADE, PRIMARY KEY (product\_id, category\_id) |



**SQL查询**

递归查询所有多层级分类商品

WITH RECURSIVE CategoryHierarchy AS (

SELECT

category\_id,

name,

parent\_id,

CAST(name AS CHAR(255)) AS full\_path

FROM

Categories

WHERE

parent\_id IS NULL

UNION ALL

SELECT

c.category\_id,

c.name,

c.parent\_id,

CONCAT(ch.full\_path, ' - ', c.name) AS full\_path

FROM

Categories c

INNER JOIN

CategoryHierarchy ch ON c.parent\_id = ch.category\_id

)

SELECT

ch.full\_path AS category\_path,

p.name AS product\_name,

p.price,

p.description,

m.name AS manufacturer\_name,

m.logo

FROM

CategoryHierarchy ch

INNER JOIN

ProductCategories pc ON ch.category\_id = pc.category\_id

INNER JOIN

Products p ON pc.product\_id = p.product\_id

INNER JOIN

Manufacturers m ON p.manufacturer\_id = m.manufacturer\_id

ORDER BY

ch.full\_path, p.name;

