* 描述

该实例是一个客房管理系统，用于管理酒店客房的类型、价格、客房信息以及客户信息。以下是对该系统的描述和回答问题：

* 实体和联系：

- 实体：room\_type（客房类型）、room\_price（价目信息）、room\_info（客房信息）、customer\_info（客户信息）

- 联系：room\_price与room\_type之间的外键联系、customer\_info与room\_info之间的外键联系

* 实体和联系的属性：

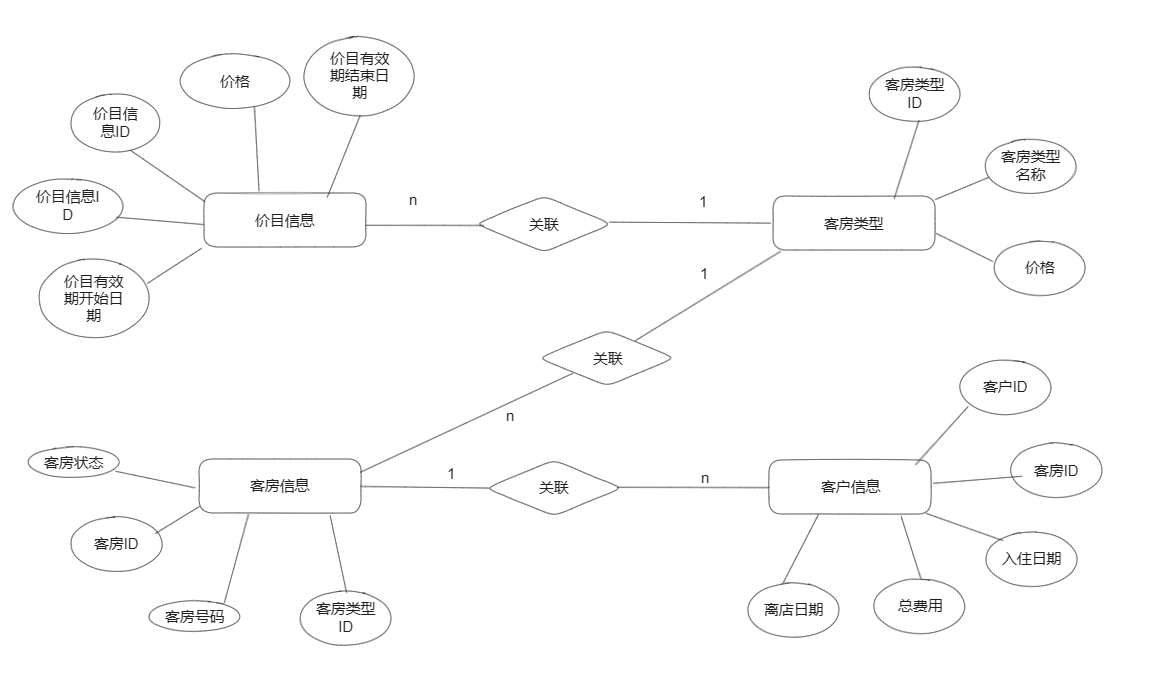
- room\_type：type\_id（主键），type\_name，price

- room\_price：price\_id（主键），type\_id（外键），start\_date，end\_date，price

- room\_info：room\_id（主键），type\_id（外键），room\_number，status

- customer\_info：customer\_id（主键），room\_id（外键），check\_in\_date，check\_out\_date，total\_cost

* E-R图：



* 关系模式：

room\_type (type\_id [PK], type\_name, price)

room\_price (price\_id [PK], type\_id [FK], start\_date, end\_date, price)

room\_info (room\_id [PK], type\_id [FK], room\_number, status)

customer\_info (customer\_id [PK], room\_id [FK], check\_in\_date, check\_out\_date, total\_cost)

其中，[PK]表示主键，[FK]表示外键。

* Sql语句：

1. 客房类型表（room\_type）：

```

CREATE TABLE room\_type (

type\_id INT PRIMARY KEY,

type\_name VARCHAR(50) NOT NULL,

price DECIMAL(10,2) NOT NULL

);

```

2. 价目信息表（room\_price）：

```

CREATE TABLE room\_price (

price\_id INT PRIMARY KEY,

type\_id INT NOT NULL,

start\_date DATE NOT NULL,

end\_date DATE NOT NULL,

price DECIMAL(10,2) NOT NULL,

FOREIGN KEY (type\_id) REFERENCES room\_type(type\_id)

);

```

3. 客房信息表（room\_info）：

```

CREATE TABLE room\_info (

room\_id INT PRIMARY KEY,

type\_id INT NOT NULL,

room\_number VARCHAR(20) UNIQUE NOT NULL,

status VARCHAR(10) NOT NULL DEFAULT 'Vacant',

FOREIGN KEY (type\_id) REFERENCES room\_type(type\_id)

);

```

4. 客户信息表（customer\_info）：

```

CREATE TABLE customer\_info (

customer\_id INT PRIMARY KEY,

room\_id INT NOT NULL,

check\_in\_date DATE NOT NULL,

check\_out\_date DATE,

total\_cost DECIMAL(10,2),

FOREIGN KEY (room\_id) REFERENCES room\_info(room\_id)

);

```

以下是触发器的SQL语句：

1. 入住触发器（check\_in\_trigger）：

CREATE TRIGGER check\_in\_trigger AFTER INSERT ON customer\_info

FOR EACH ROW

BEGIN

UPDATE room\_info SET status = 'Occupied' WHERE room\_id = NEW.room\_id;

END;

2. 退房触发器（check\_out\_trigger）：

```

CREATE TRIGGER check\_out\_trigger AFTER UPDATE ON customer\_info

FOR EACH ROW

BEGIN

IF NEW.check\_out\_date IS NOT NULL THEN

UPDATE room\_info SET status = 'Vacant' WHERE room\_id = NEW.room\_id;

END IF;

END;

以下是存储过程的SQL语句：

CREATE PROCEDURE calculate\_cost(IN start\_date DATE, IN end\_date DATE)

BEGIN

SELECT rt.type\_name, SUM(DATEDIFF(ci.check\_out\_date, ci.check\_in\_date)) AS total\_days, SUM(rp.price \* DATEDIFF(ci.check\_out\_date, ci.check\_in\_date)) AS total\_cost

FROM customer\_info ci

JOIN room\_info ri ON ci.room\_id = ri.room\_id

JOIN room\_type rt ON ri.type\_id = rt.type\_id

JOIN room\_price rp ON rt.type\_id = rp.type\_id AND ci.check\_in\_date >= rp.start\_date AND ci.check\_out\_date <= rp.end\_date

WHERE (ci.check\_in\_date BETWEEN start\_date AND end\_date) OR (ci.check\_out\_date BETWEEN start\_date AND end\_date)

GROUP BY rt.type\_name;

END;

以下是视图的SQL语句：

CREATE VIEW vacant\_rooms\_view AS

SELECT ri.room\_id, ri.room\_number, rt.type\_name

FROM room\_info ri

JOIN room\_type rt ON ri.type\_id = rt.type\_id

WHERE ri.status = 'Vacant';