

# CS1555 Recitation 12 Solution

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Objective: to practice ER diagrams and transforming them to relational schemas

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## ER Diagrams

1. Create an ER Diagram for a rental management company that rents apartments. Each apartment has an address (street address, city, zipcode), apt\_number, floor, last inspection permit number, number of bedrooms and number of bathrooms. Each apartment also has an owner. We keep the owner's name and address only. The apartments are rented to tenants who are required to sign leases. Each lease has a lease\_no, duration, start-date, end-date, and monthly payment. When the tenants renew the lease, we keep track of the renewal date and the duration of the renewal. We keep track of all the apartments a tenant has rented from the company before. Tenants have SSNs, names, occupation, previous address(es), cell phone numbers, and monthly income. A tenant could submit a maintenance request for the apartment where something broke. A maintenance request should have request\_date, problem, description and whether it has been resolved.

NOTE: this is a more complex example that brings into ER diagram weak entities and identifying relationships

2. Transform the ER diagram from part 1 into relational schemas

## Observations:

A **rental management company** that rents apartments.

Each **apartment** has an address (street address, city, zipcode), apt\_number, floor, last inspection permit number, number of bedrooms and number of bathrooms.

Each **apartment** also has an **owner**. We keep the owner's name and address only.

The **apartments** are **rented** to **tenants** who are required to **sign leases**.

Each **lease** has a lease\_no, duration, start-date, end-date, and monthly payment.

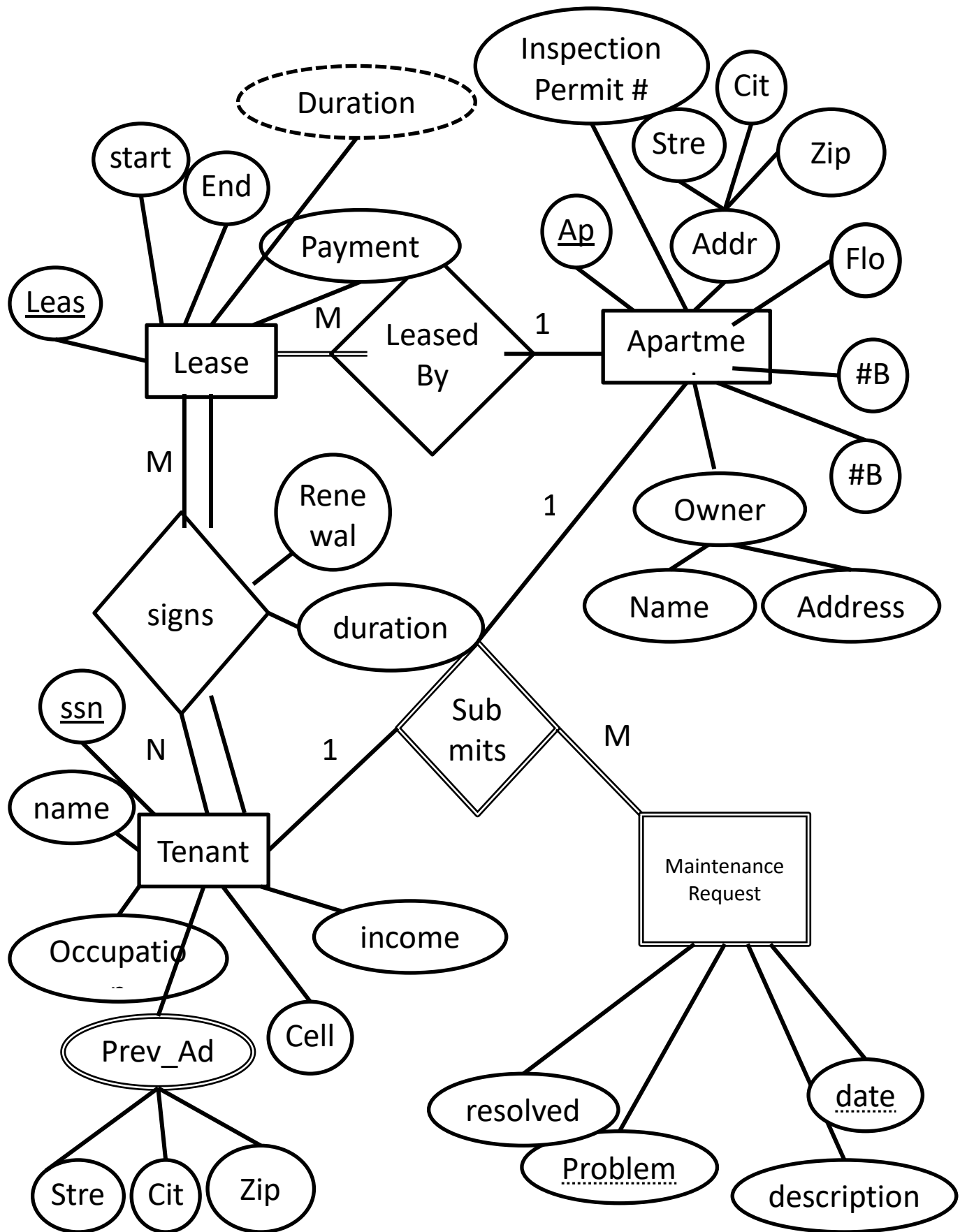
When the **tenants** **renew** the **lease**, we keep track of the renewal date and the duration of the renewal.

We keep track of all the apartments a tenant has rented from the company before.

**Tenants** have SSNs, names, occupation, previous address(es), cell phone numbers, and monthly income.

A **tenant** could **submit** a **maintenance request** for the **apartment** where something broke.

A maintenance request should have request\_date, problem, description and whether it has been resolved.



## 2. Transform the ER diagram from part 1 into relational schemas

### Entities:

1. Apartment ( address(street address, city, zipcode), apt\_no, floor, n\_bedrooms, n\_bathrooms, inspection\_permit\_no, {Owner(name, address)})
2. Lease ( lease\_no, duration, start-date, end-date, monthly payment)
3. Tenant (ssn, name, occupation, {previous address(street, city, zipcode)}, cell\_no, income)
4. Maintenance Request (date, problem, description, resolved) – weak entity

### Relationships:

1. Leased By <Lease, Apartment> M:1, TOTAL/PARTIAL
2. Signs < Lease, Tenant> M:N, TOTAL/TOTAL, renewal\_date, duration
3. Submits <Tenant, Apartment, MaintenanceRequest> 1:1:M  
PARTIAL/PARTIAL/TOTAL

### The resulting schemas after mapping:

APARTMENT (apt\_no, floor, n\_bedrooms, n\_bathrooms, inspection\_permit\_no, street address, city, zipcode, owner\_name, owner\_address)

LEASE ( lease\_no, start-date, end-date, monthly payment, apt\_no)

FK (apt\_no) → APARTMENT (apt\_no)

TENANT (ssn, name, occupation, cell\_no, income)

MAINTENANCE\_REQUEST (date, problem, apt\_no, ssn, description, resolved)

FK (apt\_no) → APARTMENT (apt\_no)

FK (ssn) → TENANT (ssn)

TENANT\_SIGNATURE (renewal\_date, lease\_no, ssn, duration)

FK (lease\_no) → LEASE (lease\_no)

FK (ssn) → TENANT (ssn)

TENANT\_PREV\_ADDR (ssn, street address, city, zipcode)

FK (ssn) → TENANT (ssn)

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