**RENTAL MANAGEMENT DATABASE DESIGN DOCUMENT**

**USF\_ID:U72254994(Venkata Satya Sai Lakshmi Lavanya)**

**Subject\_ID:ISM6218(Advanced Database Management System)**

**Submission\_Date:05-09-2021**

**Table Of Contents**

**Topic------------------------------------------------------------------------------------------Page\_number**

**Purpose-------------------------------------------------------------------------------------- 3**

**Narrative------------------------------------------------------------------------------------ 3**

**Requirements------------------------------------------------------------------------------ 3**

**Entities--------------------------------------------------------------------------------------- 4**

**Entities with attributes------------------------------------------------------------------ 4-5**

**Business Rules------------------------------------------------------------------------------ 5**

**ERD-------------------------------------------------------------------------------------------- 6**

**EERD------------------------------------------------------------------------------------------- 7**

**Relational Schema------------------------------------------------------------------------- 8**

**Entities and attributes and their constraints--------------------------------------- 9-11**

**Purpose**

The purpose of this Database Design Documentation is to create an outline of the database that is usually required by any rental management system. Further efforts have been put to make sure that all the business rules mentioned in the narrative document are met. This database holds information about the tenants, properties and landlords. This database is meant to keep a track of the maintenance and inspection activities that are performed on properties. The database also comprises of entities that hold information about vendors who perform different maintenance services on properties. Further, the database keeps a track of rent payment transactions. The main goal is to collect and maintain information about all the tasks and activities that are performed from the beginning of property inspection till the date of lease termination.

**Narrative**

A rental management company manages business transactions consisting of tenants who rent the properties, landlords who own the properties, tenants who inspect the properties, vendors who conduct maintenance at the properties, tenants who request maintenance at the properties, and tenants who pay rent at the properties. Information like names, and contact details are collected about tenants and landlords. Number of late payments are also tracked. Further, Vendor Information (names, contact details, and services offered) is collected. Address Information about properties is maintained. Inspection related information such as which tenant conducted the inspection of which property, the type of inspection, and a photo image of the item inspected are maintained in a separate entity. Information collected about maintenance include information about which vendor serviced which property, the type of maintenance and the date performed. Also, details about rent payments are also captured.

**Requirements (Actors and roles)**

Landlord: Landlords own one or more properties which is rented to zero or one tenant and the landlord receives payment from the tenant in single payment or in multiple payments.

Tenant: Each tenant can own one and only one property. Tenant can make Zero,one or multiple payments to landlord for the property and they can request repair services on properties.

Property: Properties are owned by zero or one tenant. These properties receive repair services on request from the tenant.

Vendor: The maintenance services that are performed on the property are offered by different vendors.

Services: These are the list of maintenance services from which the tenant can make a selection and then the selected services are performed on the properties.

**Entities**

Landlord

Tenant

Property

Vendor

Services

**Entities with attributes**

Landlords

* Landlord\_Ref\_num
* First\_name
* Last\_name
* Address
* (H-no, Street\_no,Community,Pin\_code)
* Ph\_no
* Email\_address
* Property\_ID
* Corresponding\_Tenant\_Ref\_num

Tenant

* Tenant\_Ref\_num
* First\_name
* Last\_name
* Address
* (H-no, Street\_no,Community,Pin\_code)
* Ph\_no
* Email\_address
* Property\_ID
* Corresponding\_Landlord\_Ref\_Num
* No\_of \_late\_payments

Property

* Property\_ID
* Address
* (H-no, Street\_no,Community,Pin\_code)
* Neighbourhood
* (Schools,Malls,Food\_courts,Transit\_options)
* Landmark
* Age\_of\_the \_property
* Property\_Type
* Landlord\_Ref\_num
* Tenant\_Ref\_num

Services

* Service\_ID
* Service\_description
* Service\_cost
* Vendor\_ID
* Service\_Type
* Expected\_Duration

Vendor

* Vendor\_ID
* Vendor\_name
* List\_of\_services\_offered
* Rating
* Ph\_no
* Email\_address
* Office\_address
* (Street\_no,pincode,company\_name)

**Business Rules**

1. A landlord owns at least one or more properties.
2. A property is owned by only one landlord.
3. A tenant rents only one property.
4. A tenant requests zero, one or more than one repair of a property.
5. A property has zero or one tenants, and no more than one tenant.
6. A property has zero, one or more than one maintenance.
7. Tenants conduct one or more inspections of a property.
8. Tenants pay zero, one or more than one rent payment.
9. A property is inspected zero, one or more than one times.
10. A property received zero, one or more than one rent payment.
11. A vendor conducts zero, one or more than one maintenance on zero, one or more than one property.

**Entity Relationship Diagram(ERD)**



**EERD**



**Relational Schema**

**Diagram

Description automatically generated**

**Tables and attributes and their Constraints**

Entity(Landlord)

Attributes in Landlord:

* Landlord\_Ref\_num(Primary\_key)
* First\_name
* Last\_name
* Address(Composite attribute with H-no,streetno,pincode,community etc..)
* Ph\_no
* Email\_address
* Property\_ID(Foreign key in landlord table and Primary key in property table)
* Tenant\_Ref\_num(Foreign key in landlord table and Primary key in Tenant table)

Entity(Property)

Attributes in Property

* Property\_ID(Primary\_key)
* Address(Composite attribute with H-no,streetno,pincode,community etc..)
* Neighbourhood(Composite attribute with schools,Hospitals, Transit facilities etc..)
* Landmark
* Age of property
* Property\_type(categorical with values like apartment, villa,warehouse etc..)
* Landlord\_Ref\_num(Foreign key in Property table and Primary key in Landlord table)
* Tenant\_Ref\_num(Foreign key in Property table and Primary key in Tenant table)

Entity(Lease\_details)

Attributes in Lease\_details

* Date\_of\_availability
* Lease\_Tenure
* Monthly\_payment\_due\_date
* Rental\_amount
* Property\_ID(PK,FK)
* Tenant\_Ref\_num(Can take null value since it’s not necessary that all properties have tenants) (Foreign key in Lease details table and Primary key in Tenant table)
* Landlord\_Ref\_num(Foreign key in Lease\_details table and Primary key in Tenant table)

Entity(Tenant)

Attributes in Tenant

* Tenant\_Ref\_Num(Primary\_Key)
* First\_Name
* Last\_Name
* Address(Composite attribute with H-no,streetno,pincode,community etc..)
* Phone\_no
* Email\_address
* Property\_ID(Foreign key in Tenant table and Primary key in Property table)
* Landlord\_Ref\_Num(Foreign key in Tenant table and Primary key in Landlord table)
* Late\_Payment\_count
* Move\_in\_date
* Lease\_termination\_date

Entity(Inspection\_details)

Attributes in Inspection\_details

* Inspection\_booking\_Ref(Primary\_key){Composite key which is a combination of tenant\_ref\_num and Property\_revist\_count)
* Inspected\_by(This attribute refers to tenant\_ref\_num in tenant table hence it is a foreign key)
* Inspection\_date
* Inspection\_Type
* Time\_slot
* Property\_Id(Foreign\_key in Inspection\_details table and primary key in property table)
* Property\_photo\_desc
* Photo\_filename
* Photo\_location

Entity(Payment\_details)

Attributes in Payment\_details

* Payment\_ID(Primary\_key)
* Due\_date
* Payment\_type
* Paid\_date
* Payment\_method
* Amount
* Paid\_by(Refers to tenant\_ref\_num in tenant table since amount/rent is paid by tenant hence it is a foreign key)
* Property\_ID(Foreign\_key in Payment\_details table and primary key in property table)
* Paid\_to(Refers to landlord\_ref\_num in landlord table since amount/rent is paid to landlord hence it is a foreign key)

Entity(Maintenance)

Attributes in Maintenance

* Maintenance\_booking\_ID(primary\_key)
* Service\_date
* Time\_slot
* Status(categorical upcoming /cancelled/completed)
* Services\_requested(Multivalued attribute)
* Customer\_type
* Property\_ID(Foreign key in Maintenance table and primary key in Property table)
* Vendor\_Requested(Foreign key in Maintenance table and primary key in vendor table)
* Tenant\_Ref\_Num(Foreign key in Maintenance table and primary key in tenant table)

Entity(Services)

Attributes in Services

* Service\_ID(primary\_key)
* Service\_desc
* Service\_cost
* Vendor\_ID(Foreign key in Services table and primary key in vendor table)
* Service\_type(Categorical which contains values like renivate,remodel,repair etc)
* Expected\_duration

Vendor

* Vendor\_Id(Primary\_key)
* Vendor\_name
* Services\_offered(Multivalued attribute)(Foreign key in vendor table and primary key in Service table)
* Rating
* Email\_address
* Office\_address