Data And Applications
Project Phase - 1

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The Mini-World

Society Management is the prominent need of our modern and enormous societies. It helps to reach maximum people at the same time and reduces the effort.It is difficult to keep a track of each family living within a society and record the information manually in spreadsheets. In this case, this society management system helps maintain the details of owners and tenants living in the apartment complex.It becomes easy for the members to contact the authorities of the society for any service they require.
This database allows users to place requests, lodge complaints and also helps Society Managers to maintain track of issues yet to be resolved.It also helps them to update the database easily in-case some resident leaves the society or someone joins the society.They can also track the number of visitors who are visiting the society, details of maintenance workers and security.

The purpose of this database thus is to assist all the society members in terms of ease of accessibility for both the society members and committee.

The users of this database thus will be both the society members and committee.

Database Requirements

Entity Types:

1. Residents
2. Flats
3. Complaints/Issues
4. Resident Welfare Association (committee)
5. Visitors
6. Security
7. Buildings
8. Resident Workers
9. Requests

Table for Entity-types,Attributes,Data Types,Domain

Entity Type	Attributes	Data Types	Domain
Residents	Aadhar Number	INT	Any 12 Digit Number
	Name	VARCHAR	Atmax 30 letters
	D.O.B	DATE	Any Valid Date
	Age (derived attribute from DOB)	INT	[0,150]
	Gender	VARCHAR	{Male,Female,Others}
	Email	VARCHAR	Any Valid Emails
	Phone Number	INT	Any 10 Digit Numbers

	Flat number	INT	[A-N] + Any 4 Digit Number
Flats	Flat number	VARCHAR	[A-N] + Any 4 Digit Number
	Owner	VARCHAR	Atmax 30 letters
	Building identifier	VARCHAR	[A - N]
	Number of residents	INT	[0-10]
Complaints/ Issues	Complaint ID	INT	Any 7 Digit Number
	Flat number	VARCHAR	[A-N] + Any 4 Digit Number
	Complaint Type	VARCHAR	Atmax 100 letters
	Complaint Date	DATE	Any Valid Date
	Resolve_status	INT	{ 0 or 1 }
Visitors	Flat Number	VARCHAR	[A-N] + Any 4 Digit Number
	Phone Number	INT	Any 10 Digit Numbers
	Name	VARCHAR	Atmax 30 letters
	Entry_Time	TIME	00:00 - 23:59
	Exit_Time	TIME	00:00 - 23:59

Security	Security ID	INT	Any 4 Digit Number
	Name	VARCHAR	Atmax 30 letters
	Age	INT	[21,150]
	Phone Number	INT	Any 10 Digit Numbers
Requests	Request ID	INT	Any 5 Digit Number
	Flat number	VARCHAR	[A-N] + Any 4 Digit Number
	Request Type	VARCHAR	Atmax 100 letters
	Request date	DATE	Any Valid Date
	Resolve_status	INT	{ 0 or 1 }
Maintenance Workers	Worker ID	INT	Any 4 Digit Number
	Name	VARCHAR	Atmax 30 letters
	Phone Number	INT	Any 10 Digit Numbers
Building	Building identifier	VARCHAR	[A-N]
	Number of flats	INT	Any 2 digit number
RWA	Name	VARCHAR	Atmax 30 letters

	D.O.B	DATE	Any Valid Date
	Age	INT	[30,150]
	Gender	VARCHAR	{Male,Female,Others}
	Email	VARCHAR	Any Valid Emails
	Phone Number	INT	Any 10 Digit Numbers
	Responsibility	VARCHAR	Atmax 30 letters

Two Key Attributes:
Residents have key attributes: aadhar number and phone number.

Security has key attributes: Security ID and phone number.

Weak Entity:
1. Complaints
2. Requests
3. Visitors

Relationship Types :

- Owns:

  NOTE : In *Owns* we have assumed that there is only one owner of the flat while others *reside* in a flat.

  Resident owns a flat.

  E.g. Swayam owns the C-204 flat.
  Degree - 2
  Participating entity types -Resident and Flat
  Cardinality ratio - 1 : N
  Participation constraints - a resident should own at least one flat.

- Resides in:

  Residents resides in a flat.

  E.g. Swayam,Mr. Manoj,Ms. Vandana,Aryan resides in C-204 flat.
  Degree - 2
  Participating entity types -Resident and Flat
  Cardinality ratio - N : 1
  Participation constraints - There is no constraint in this relationship type. For example there can be a vacant flat in the society.

- Belongs to:

  This Flat belongs to a particular building.

  E.g. C-204 belongs to building C.
  Degree - 2
  Participating entity types - Flat and building.
  Cardinality ratio - N : 1
  Participation constraints - Each flat belongs to exactly one building and a building must contain at least one flat.

- Requested by:

  NOTE : Each request has its own unique ID so a flat can have N requests but one particular request cannot belong to multiple flats.

  A request requested by a flat.

  E.g. Pest Control requested by C-204.
  Degree - 2
  Participating entity types - Request and Flat
  Cardinality ratio - N : 1
  Participation constraints - N requests are requested by only one flat.

- Dropped by:

  A visitor dropped by to visit a flat.

  E.g. Rohan Kumar dropped by for flat C-204 to visit Swayam.
  Degree: 2

Participating entity types - Visitor and Flat.
Cardinality ratio : N : M
Participation constraints - Any number of visitors must be dropped by to visit at least one flat.

- Lodged by:

  NOTE : Each complaint has its own unique ID so a flat can have N complaints but one particular complaint cannot belong to multiple flats.

  A complaint lodged by a flat.

  E.g. Water-mosquitoes breeding lodged by G-103.
  Degree - 2
  Participating entity types - Complaint and Flat
  Cardinality ratio - N : 1
  Participation constraints - N complaints are lodged by only one flat.

- Guarded by:

  NOTE : According to our security system , a security guard must guard only one building and each building has only one guard for security.

  A building guarded by security.

  E.g. Building C guarded by Rohan Sethji.
  Degree - 2
  Participating entity types - Building and Security.
  Cardinality ratio - 1 : 1
  Participation constraints - exactly one building is guarded by exactly one security guard.

Degree > 3 Relationship Type:

- Handles:

  RWA handles complaints,maintenance workers,and security.

E.g. The RWA handles all the complaints of society members and also maintains this along with information of maintenance workers and security.
Degree - 4
Participating entity types - RWA,Complaints,Maintenance Workers,Security.

Subclass:

1. Flats ⊂ Buildings
2. RWA ⊂ Residents

Composite attribute:

1. Name -> (first name and last name)
2. Email ID -> (username and @ and mail server and domain)

Multivalued attribute:

Note : Assuming entities can have many phone numbers and emails, example: Rohan Sethji has 2 phone numbers and also 2 emails.

1. Phone number
2. Email ID

Derived attribute:

1. Age of resident (From DOB of resident).
2. Number of residents in a flat (From flat number in Resident Entity).

2.1 Bonus:

Relationship type: Works_under:

Participating Entity : Residents

Resident-1 works under Resident-2 in the Resident Welfare Association
Eg: Aman works under Raman in the RWA where Raman is the head of the Election Committee , Aman is conducting the elections for various roles in the society.

Functional Requirements:

Retrievals:

• Selections:

1. List of all flats.
2. List of all residents.

• Projections:

1. Show visitors of a particular date.
2. Show complaints of a particular flat.

• Aggregate:

1. Total number of residents in a house.
2. Total number of requests of a particular flat.

• Search:

1. Search residents by Aadhar ID.
2. Search issues by flat number.

• Analysis:

1. Generating a report about the number of complaints and requests initiated by the residents.

2. Generating a report about the number of visitors for each building (security analysis).

1.

Modifications:

• Insertion:

1. Allocating new residents in a flat.
2. Adding new members to the RWA.

• Updation:

1. Updating the positions of members of RWA.
2. Updating the number of unresolved requests and complaints.
3. Updating the Security of a particular building.

• Deletion:

1. Deleting completed requests from the request list of the residents..
2. Removing the residents who are relocating from the database.
3. Deleting the Security Info/Worker Info if they resign/are fired.