Empowering Governance through Citizen Data Management

DBMS Project- G5_05

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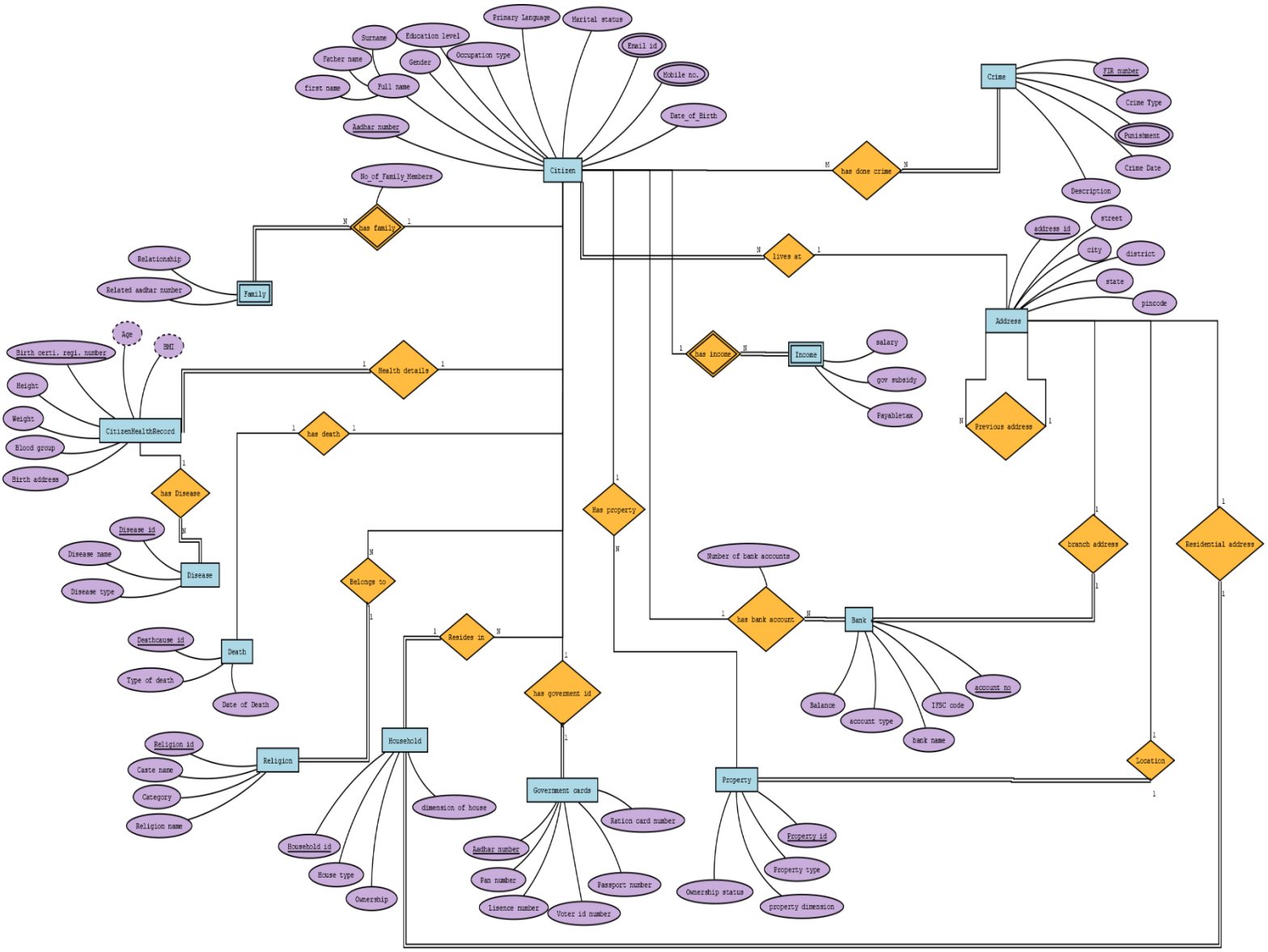
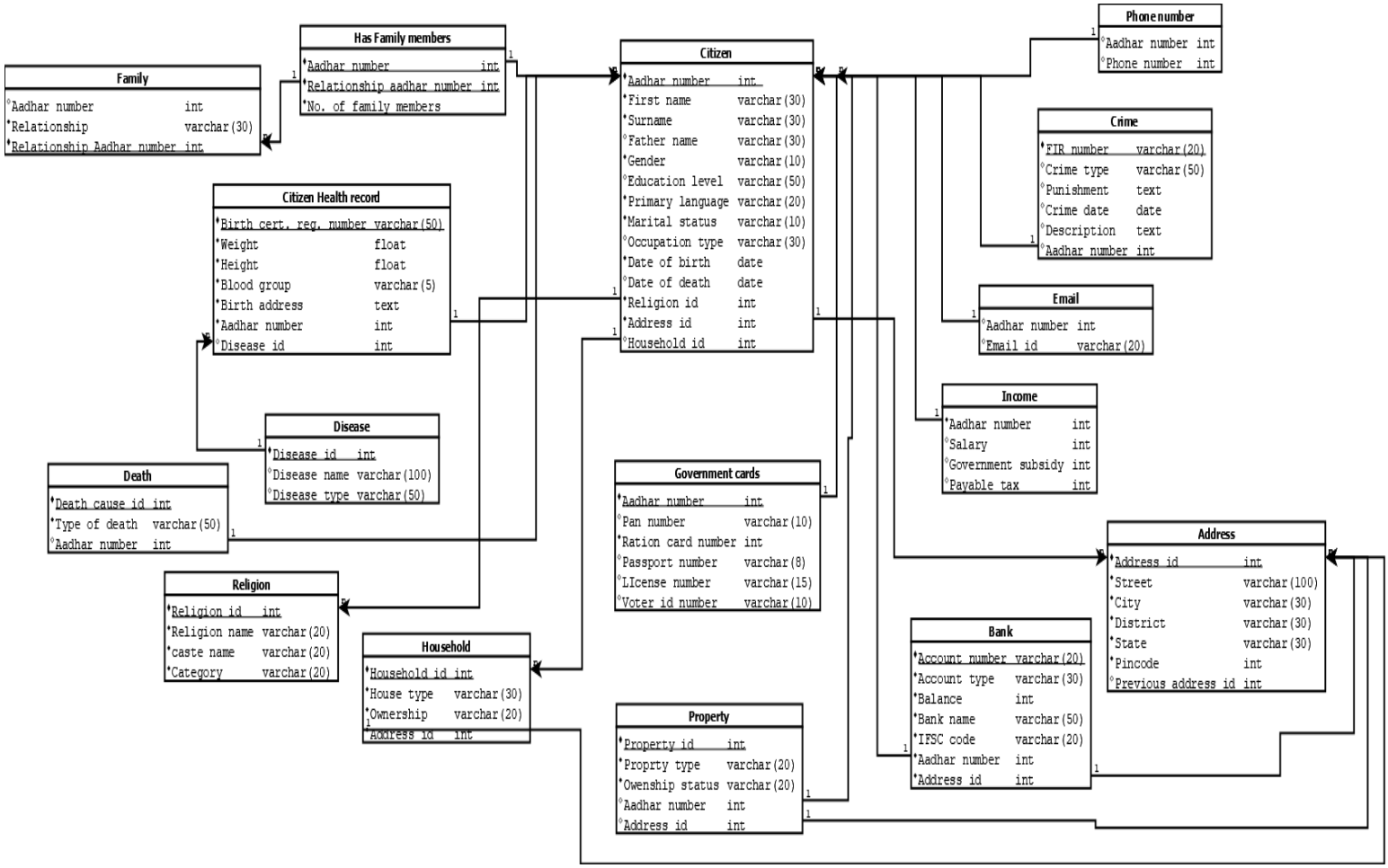
ER Diagram


Primary Language
Marital status
Surname
Education level
Email id
Father name
Gender
Occupation type
Mobile no.
first name
Full name
Date_of_Birth
Aadhar number
Citizen
Crime
FIR number
Crime Type
Punishment
Crime Date
Description
has done crime
No_of_Family_Members
has family
Relationship
Related aadhar number
Family
lives at
address id
street
city
district
state
pincode
Address
Age
BMI
Birth certi. regi. number
Height
Weight
Blood group
Birth address
CitizenHealthRecord
Health details
has death
has Disease
has income
Income
salary
gov subsidy
Payabletax
Previous address
Disease id
Disease name
Disease type
Disease
Belongs to
Has property
Number of bank accounts
has bank account
Bank
branch address
Residential address
Deathcause id
Type of death
Death
Date of Death
Resides in
has goverment id
Balance
account type
IFSC code
bank name
account no
Religion id
Caste name
Category
Religion name
Religion
Household
Government cards
Property
Location
dimension of house
Household id
House type
Ownership
Aadhar number
Pan number
Lisence number
Voter id number
Ration card number
Passport number
Property id
Property type
Ownership status
property dimension

Relational Schema



Functional Dependency and BCNF Analysis

1. Citizen

aadhar_number → {first_name, surname, father_name, gender,
education_level, primary_language,
marital_status, occupation_type, date_of_birth, date_of_death, religion_id,
address_id,
household_id}

2. CitizenEmail

(aadhar_number, email_id) → ∅

3. CitizenMobile

(aadhar_number, mobile_no) → ∅

4. Family

related_aadhar_number → {aadhar_number, relationship,
no_of_family_members}

5. CitizenHealthRecord

birth_cert_reg_no → {age, bmi, weight, height, blood_group, birth_address,
aadhar_number,
disease_id}

6. Disease

disease_id → {disease_name, disease_type}

7. Death

deathcause_id → {type_of_death, aadhar_number}

8. Income

aadhar_number → {salary, gov_subsidy, payabletax}

9. Address
address_id → {street, city, district, state, pincode, previous_address_id}

10. Crime
fir_number → {crime_type, punishment, crime_date, description, aadhar_number}

11. Property
property_id → {property_type, ownership_status, property_dimension, aadhar_number, address_id}

12. Household
household_id → {house_type, ownership, dimension_of_house, address_id}

13. Religion
religion_id → {religion_name, caste_name, category}

14. GovernmentCards
aadhar_number → {pan_number, ration_card_number, passport_number, license_number, voter_id_number}

15. Bank
account_no → {account_type, balance, bank_name, ifsc_code, aadhar_number, address_id}

→Proof that Relations are in BCNF

Citizen

Functional Dependency: aadhar_number → {first_name, surname, father_name, gender, education_level, primary_language, marital_status, occupation_type, email_id, mobile_no, date_of_birth, religion_id, address_id, household_id}

- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.

→ Therefore, the relation 'Citizen' is in BCNF.

Family

Functional Dependency: related_aadhar_number → {relationship, no_of_family_members}

- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.

→ Therefore, the relation 'Family' is in BCNF.

→for the citizenemail and citizenmobilenumber both entity tables are in BCNF as they are in Family Entity.

CitizenHealthRecord

Functional Dependency: birth_cert_reg_no → {age, bmi, weight, height, blood_group, birth_address, aadhar_number, disease_id}

- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.

→ Therefore, the relation 'CitizenHealthRecord' is in BCNF.

Disease

Functional Dependency: disease_id → {disease_name, disease_type}

- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Disease' is in BCNF.

Death

Functional Dependency: deathcause_id → {type_of_death, date_of_death, aadhar_number}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Death' is in BCNF.

Income

Functional Dependency: aadhar_number → {salary, gov_subsidy, payabletax}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Income' is in BCNF.

Address

Functional Dependency: address_id → {street, city, district, state, pincode, previous_address_id}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Address' is in BCNF.

Crime

Functional Dependency: fir_number → {crime_type, punishment, crime_date, description, aadhar_number}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Crime' is in BCNF.

Property

Functional Dependency: property_id → {property_type, ownership_status, property_dimension, aadhar_number, address_id}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Property' is in BCNF.

Household

Functional Dependency: household_id → {house_type, ownership, dimension_of_house, address_id}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Household' is in BCNF.

Religion

Functional Dependency: religion_id → {religion_name, caste_name, category}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Religion' is in BCNF.

GovernmentCards

Functional Dependency: aadhar_number → {pan_number, ration_card_number, passport_number, license_number, voter_id_number}
- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'GovernmentCards' is in BCNF.

Bank

Functional Dependency: account_no → {account_type, balance, bank_name, ifsc_code, aadhar_number, address_id}

- The left-hand side of the FD is the primary key of the table.
- All non-key attributes are fully functionally dependent on the primary key.
- There are no partial or transitive dependencies.
→ Therefore, the relation 'Bank' is in BCNF.