Alien Adoption Database Writeup

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Summary:

We designed a database to facilitate the adoption of orphaned aliens. The overall structure consists of Aliens who live in Orphanages and these Orphanages are contained in an Agency. Different planets can have any number of Agencies and Orphanages. An adoption request occurs between an Alien and a Family. This request is removed once it has been approved or denied. If this request is approved then the Alien is paired with the family in the Adopted table. Aliens that have not been adopted can remain in the adopted table with a Null family field.

Database Requirements:

Agency

An agency has a unique name within the organization

An agency exists on a planet

It functions as a broker for orphanages. It can work with as many or as few orphanages as it wants (including none)

It handles adoption requests as well. It can have any number of requests (including none)

Planet

A planet has a unique name, a galaxy it is located in, and a climate

A planet can be home to any number of aliens, families, or agencies (including none)

Orphanages

An orphanage has a name and an agency it associates with

An orphanage must have one and only one agency that it affiliates with

An orphanage houses as many aliens as it wants (including none)

Family

A family has an ID, a last name, an income, and a planet of residence

It can only exist on 1 planet at a time. A family may also be interstellar and therefore not have a current planet

A family may have adopted as many aliens as it wants (including none)

Similarly, a family may have as many adoption_requests as it wants (including none)

Adoption_Request

An adoption request has an ID, an alien ID, and a family ID

It must correspond to a single alien and a single family (although aliens and families can have multiple pending requests)

Medical

A medical record has an alien's ID, their birthday, and a boolean of whether they are up-to-date on vaccinations.

Each medical record corresponds to one alien, and each alien has only one medical record.

Alien

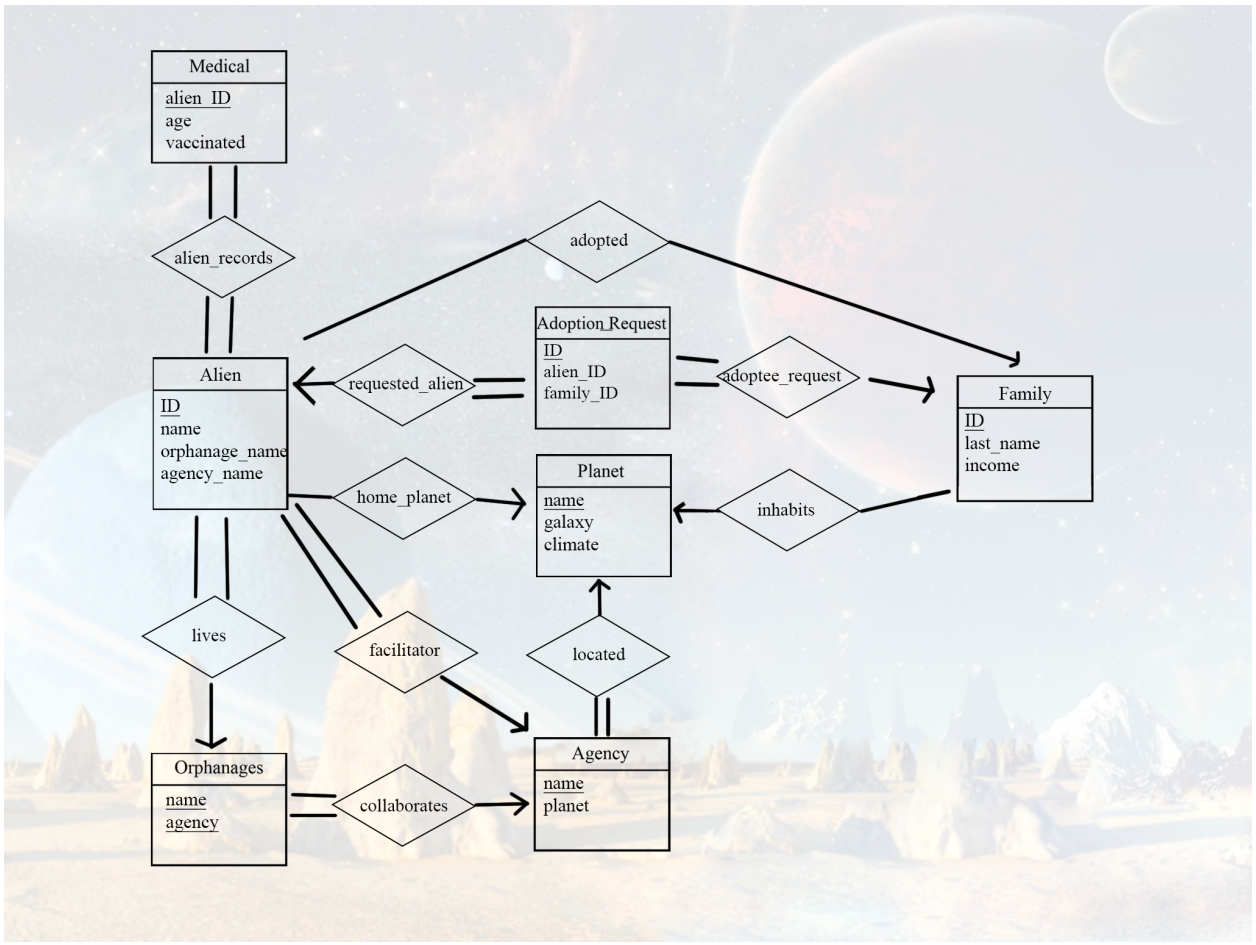
An alien has a unique identifying ID, a name, exactly one home planet, and an orphanage where they live.

An alien lives at exactly one orphanage, but each orphanage can house many aliens.

An alien can have as many family requests as it wants (including none), but it can only be adopted by one family (or none).

This is a strong entity due to it containing the primary alien key.

ER Diagram:



Reducing ER Diagram to Schemata:

Planet(name, galaxy, climate)

Family(ID, last_name, income)

Agency(name, planet)

Orphanages(name, agency)

Alien(ID, name, orphanage_name, agency_name)

Medical(alien_ID, age, vaccinated)

Home_planet(alien_ID, planet)

Inhabits(family_ID, planet)

Adoption_request(request_id, alien_ID, family_ID)

Adopted(alien_ID, family_ID)

Arguments The Schemata Are in BCNF (Our Normalization Process):

First and foremost, these Schemata are in BCNF because there are no functional dependencies in the alternate/secondary keys. We meticulously scanned the relationships to separate embedded dependencies. One example of this was how we originally included the Agency name attribute in the Adoption_Request table. Upon deeper examination we realized the Adoption_Request table already contained Alien_ID and Aliens can only be a part of one Orphanage which is a part of one Agency - therefore Agency is a dependency of Alien in this case. By removing these flaws we lay our data out with less redundancy and save memory.

Additionally, scanning the primary keys will reveal that each one of them uniquely identifies all other attributes in an entry. We achieve this by frequently using IDs

due to their simplicity and inherent uniqueness, and also by correctly decomposing our ER diagram. In each one-to-many relationship, we carefully identified the many side and used it as the primary key. We also were particular in identifying candidate keys whenever we selected a primary key because we didn't want to use a primary key that could be further decomposed and still uniquely identify all attributes.

Interface Instructions:

This interface provides you with 8 different options that are detailed below. Many of these options require knowledge of a family ID, alien ID, or a Planet's name. To get an overview of the sample data view "Choice 7" below. This interface simulates an overview of our model but does not include options like adding/removing aliens, families, orphanages, etc. The scope of that would lie in a different system designed for populating the database and not just interacting.

View an Alien's File (Choice 1):

Enter '1' to view an alien's file.

You'll be prompted to enter the Alien's ID.

If applicable, the system will display detailed information about the alien, including name, age, vaccination status, orphanage, agency, planet, and adopted family ID.

View a Family's File (Choice 2):

Enter '2' to view a family's file.

You'll be prompted to enter the Family's ID.

The system will display information about the family, including last name, income, and planet.

View Open Adoption Requests (Choice 3):

Enter '3' to view open adoption requests.

The system will display information about open adoption requests, including request ID, family ID, and alien ID.

Create New Adoption Request (Choice 4):

Enter '4' to create a new adoption request.

You'll be prompted to enter the Alien ID and Family ID.

The system will check for existing requests and if the Alien has already been adopted before creating a new adoption request.

Accept/Deny Adoption Request (Choice 5):

Enter '5' to view and decide on adoption requests.

The system will display open adoption requests and prompt you to enter a decision (1 to accept, 2 to deny) for a specific request.

View All Adoptable Aliens (Choice 6):

Enter '6' to view all adoptable aliens.

The system will display a list of aliens that are available for adoption, showing their ID, name, orphanage, agency, and planet.

See an Overview of the Database (Choice 7):

Enter '7' to see an overview of the entire database.

The system will provide an overview of all aliens, families, and planets, displaying their relevant information.

Exit (Choice 8):

Enter '8' to exit the program.

The program will terminate.