CS 5600
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Requirements and Conceptual Document
CATabase: A Cat Adoption Database Management System

I.   Requirements

    a. Problem Description

There are approximately 50-70 million feral cats in the United States, with some figures estimating at least 100 million without a home. Cats are natural predators and thus pose a serious threat to the local wildlife while also being at risk of being attacked by other cats, aggressive animals, or seriously injured by fast-moving vehicles. And yet, there are only about 2 million cats being adopted each year in the US. As such, a comprehensive cat adoption database will help people more easily connect with owners and shelters to adopt and reduce the number of vulnerable cats out in the elements.

    b. Summarized Nouns and Verbs

        i.   Nouns

            1. Cats (*Note: cats available for adoption*)

                (1) cat_id: unsigned integer

                (2) cat_name: string

                (3) cat_dob: string(yyyy-mm-dd)

                (4) cat_weight_lb: float

                    (a) Note: Weight in pounds

                (5) cat_breed: string{"Siamese", "Bengal", "American Shorthair", "Russian Blue", …}

                (6) cat_personality: string{"Friendly", "Shy", "Energetic", "Moody",...}

                (7) shelter: Object

                (8) adoption_details: ObjectArray[]

                    *(a) **adoption_details.**user_id*

                    *(b) **adoption_details.**user_first_name*

                    *(c) **adoption_details.**user_last_name*

                    *(d) **adoption_details.**user_address*

                    *(e) **adoption_details.**user_email*

                    *(f) **adoption_details.**user_phone*

                    *(g) **adoption_details.**adoption_approved*

            2. Shelters

                (1) shelter_id: unsigned integer

                (2) shelter_name: string

                 (3) shelter_location: string

(4) shelter_email: string

(5) shelter_phone: string

(6) user_ratings: Object

*(a) **user_ratings**.user_id*

*(b) **user_ratings**.user_first_name*

*(c) **user_ratings**.user_last_name*

*(d) **user_ratings**.user_address*

*(e) **user_ratings**.user_email*

*(f) **user_ratings.**user_phone*

*(g) **user_ratings**.rating_score*

3. Users:

(1) user_id: unsigned integer

(2) user_first_name: string

(3) user_last_name: string

(4) user_address: string

(5) user_email: string

(6) user_phone: string

ii. Verbs

1. House

2. Adopt

3. Rate

c. Narratives

i. Cats

1. Each cat is housed in one shelter only

2. Each cat can be applied for adoption by zero or more users

ii. Shelters

1. A shelter can house zero or more cats

2. A shelter can be rated by zero or more users

iii. Users

1. A user can apply to adopt one or more existing cats

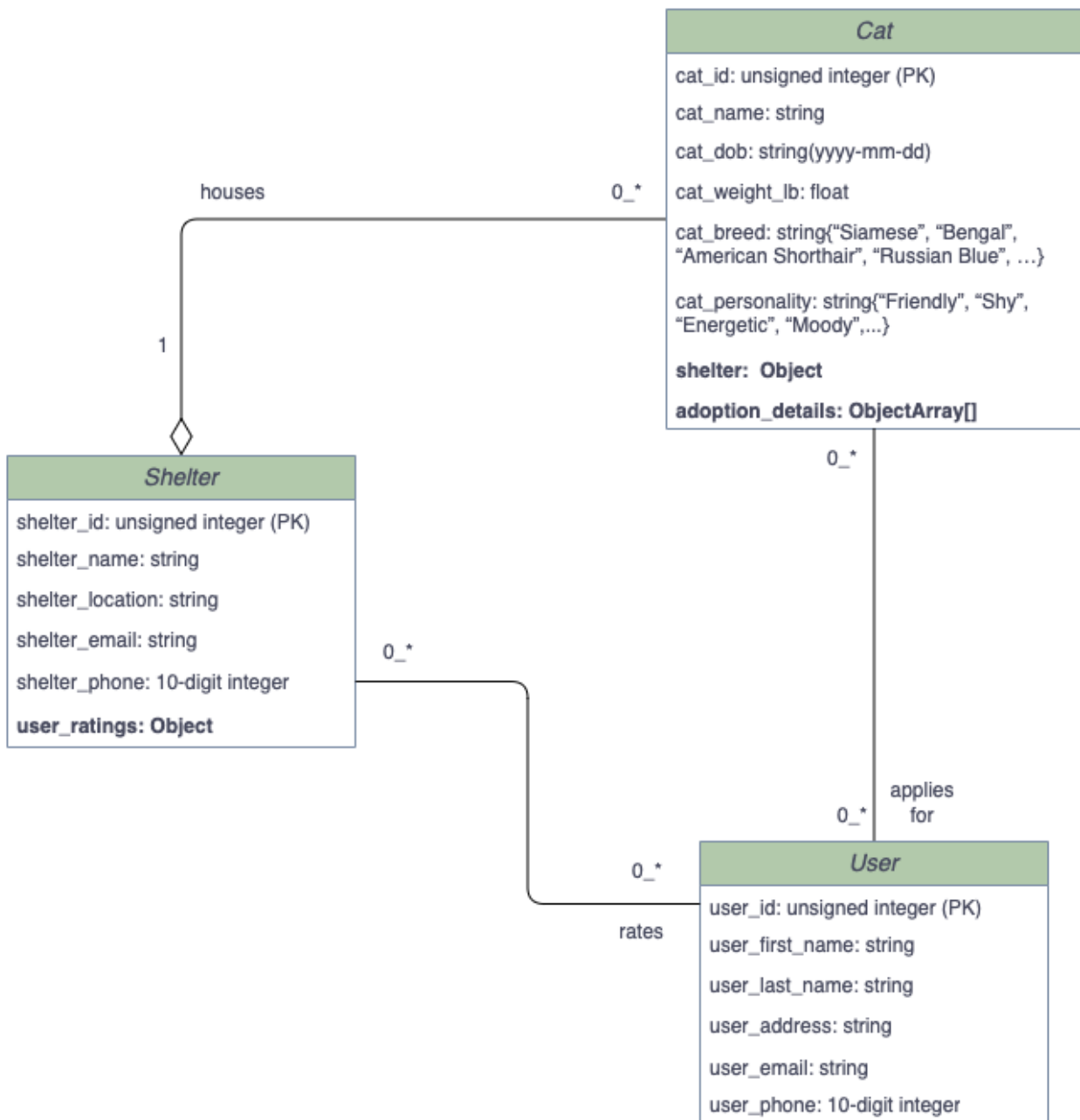2. A user can rate zero or more existing shelters on the scale of 1 to 5

d. Challenges

i. Should a cat have multiple personalities?

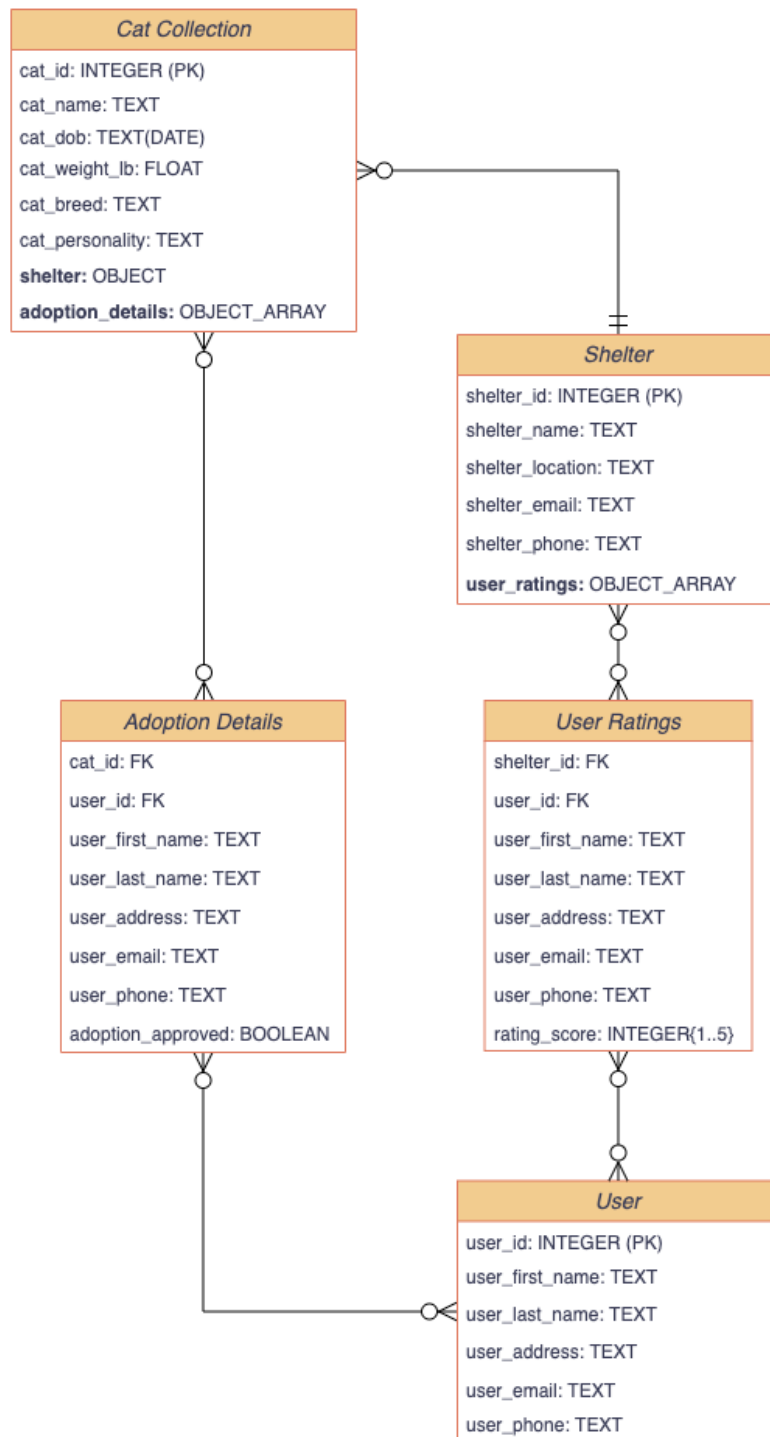ii. Should there be a separate owner class?

CATabase
UML Class Diagram

Cat

cat_id: unsigned integer (PK)

cat_name: string

cat_dob: string(yyyy-mm-dd)

cat_weight_lb: float

cat_breed: string{"Siamese", "Bengal", "American Shorthair", "Russian Blue", ...}

cat_personality: string{"Friendly", "Shy", "Energetic", "Moody",...}

shelter: Object

adoption_details: ObjectArray[]

houses   0_*

1

Shelter

shelter_id: unsigned integer (PK)

shelter_name: string

shelter_location: string

shelter_email: string

shelter_phone: 10-digit integer

user_ratings: Object

0_*

0_*

0_*

0_*

applies for

rates

User

user_id: unsigned integer (PK)

user_first_name: string

user_last_name: string

user_address: string

user_email: string

user_phone: 10-digit integer

III.   Entity-Relationship Model (ERD) with Hierarchical Tables

CATabase
Hierarchical Tables

Cat Collection

cat_id: INTEGER (PK)

cat_name: TEXT

cat_dob: TEXT(DATE)

cat_weight_lb: FLOAT

cat_breed: TEXT

cat_personality: TEXT

shelter: OBJECT

adoption_details: OBJECT_ARRAY

Shelter

shelter_id: INTEGER (PK)

shelter_name: TEXT

shelter_location: TEXT

shelter_email: TEXT

shelter_phone: TEXT

user_ratings: OBJECT_ARRAY

Adoption Details

cat_id: FK

user_id: FK

user_first_name: TEXT

user_last_name: TEXT

user_address: TEXT

user_email: TEXT

user_phone: TEXT

adoption_approved: BOOLEAN

User Ratings

shelter_id: FK

user_id: FK

user_first_name: TEXT

user_last_name: TEXT

user_address: TEXT

user_email: TEXT

user_phone: TEXT

rating_score: INTEGER{1..5}

User

user_id: INTEGER (PK)

user_first_name: TEXT

user_last_name: TEXT

user_address: TEXT

user_email: TEXT

user_phone: TEXT

IV. Document Schema
Main collections: Cats
1. Sample Cat document:

```json
{
    "cat_id": 1,
    "cat_name": "Pannier",
    "cat_dob": "2014-07-24",
    "cat_weight_lb": 13.2,
    "cat_breed": "Ragdoll",
    "cat_personality": "Ambivert",
    "shelter": {
      "shelter_id": 28,
      "shelter_name": "Lind LLC",
      "shelter_location": "44567 Golden Leaf Court",
      "shelter_email": "mmccorryr@apache.org",
      "shelter_phone": "7628662930",
      "user_ratings": [
        {
          "user_id": 86,
          "user_first_name": "Jonathon",
          "user_last_name": "Patridge",
          "user_address": "150 Logan Circle",
          "user_email": "jpatridge2d@networkadvertising.org",
          "user_phone": "9797208606",
          "rating_score": 5
        },
        {
          "user_id": 53,
          "user_first_name": "Martina",
          "user_last_name": "Maldin",
          "user_address": "39856 Rutledge Hill",
          "user_email": "mmaldin1g@cargocollective.com",
          "user_phone": "4575231925",
          "rating_score": 5
        },
        {
          "user_id": 153,
          "user_first_name": "Ainslie",
          "user_last_name": "Westmarland",
          "user_address": "670 Eagle Crest Street",
          "user_email": "awestmarland48@zimbio.com",
          "user_phone": "3844110869",
          "rating_score": 4
        }
      ]
    },
    "adoption_details": [
      {
        "user_id": 118,
        "user_first_name": "Thelma",
        "user_last_name": "Ferrarello",
        "user_address": "15221 Goodland Center",
        "user_email": "tferrarello39@vinaora.com",
        "user_phone": "4084104091",
        "adoption_approved": true
      },
      {
        "user_id": 53,
        "user_first_name": "Martina",
        "user_last_name": "Maldin",
        "user_address": "39856 Rutledge Hill",
        "user_email": "mmaldin1g@cargocollective.com",
        "user_phone": "4575231925",
        "adoption_approved": false
      }
    ]
}
```