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: ObjectArray[]
(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

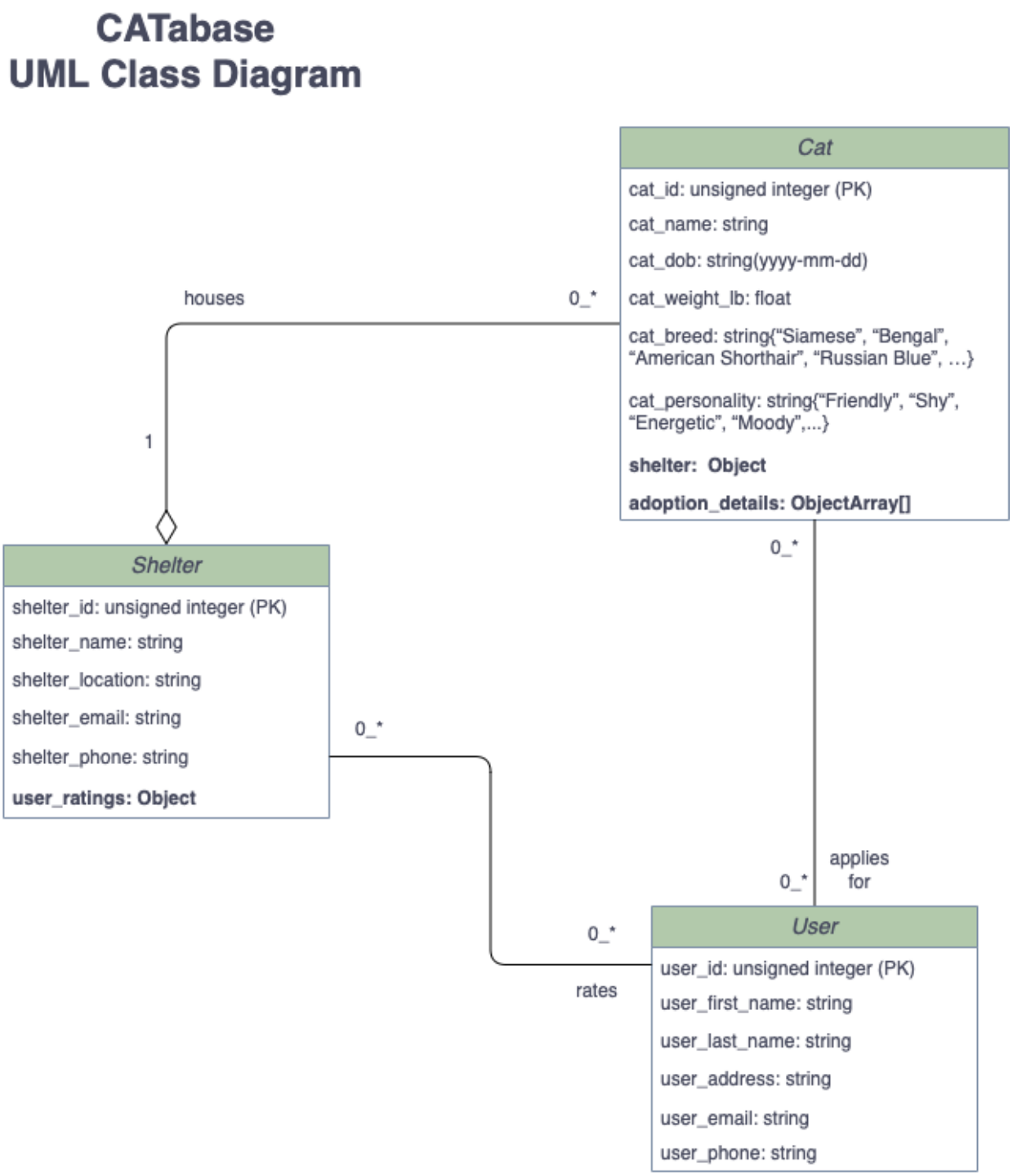
c. Narratives
i. Cats
1. Each cat is housed in one shelter only
2. Each cat can be applied for adoption by zero or more users

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?

II. Conceptual Model (UML)



III. Main Functionality and Data Structure:

a. Main functionality: Activity Log
   i. Activity log is updated for every action taken related to the database
   ii. Actions include:
      1. Viewing cats, shelters, or users databases and its elements
      2. Modifying any cat, shelter, or user
   iii. Users can view, rename or delete any log. Users can create a log by simply interacting with the database

b. Data structure
   i. The activity log will be implemented using a Redis List with key: "activities" containing element objects with the following attributes:
      1. *_id*: timestamp of the action
      2. *message*: notification content such as "viewed cat", "view shelter" or similar
   ii. Each activity object is pushed on to Redis by LPUSH, and only a specified number of most recent elements will be shown using LTRIM