# Readme Documentation

## About/Overview

The Jungle Friends Primate Sanctuary provides permanent, high-quality sanctuary care for abused or unwanted new world primates from around the United States who have been cast-off from the pet trade, retired from research, or confiscated by authorities. They are seeking to replace all their paper records with computer records where they can keep track of individual animals that are in their care.

My project creates a sanctuary system which can house these cast-off primates of varying species into different housing based on their medical needs. The sanctuary consists of two types of housing Isolation and Enclosure. A new primate arriving to the sanctuary is automatically added to the isolation to provide medical care. Since each monkey in the isolation is not medically fit, they are placed into different cages. When a monkey is fit again, it gets automatically shifted to enclosure. Monkeys belonging to the same species are added to one enclosure irrespective of their size. The system is capable to reuse an enclosure once it is empty after housing a species troop. The system handles the capacity of the enclosure and the space required to add monkeys of same species based on their sizes. The system also takes care of all the food requirements of each monkey like their favorite food and quantity based on their sizes.

## List of Features

1. The Sanctuary starts by taking 2 sizes from the user: size of Isolation and size of Enclosure.
2. User can change the no of monkeys and no of troops isolation and enclosure can handle respectively for expansion of the sanctuary.
3. The system reports all the species currently housed in the sanctuary in alphabetical order. The list also includes where in the sanctuary each species is housed.
4. Functionality to look up a particular species in the sanctuary is housed. If the species entered is not housed anywhere, the system reports the fact to the user saying “Report: The species is not present in the sanctuary”.
5. Provides an alphabetical list (by name) of all the monkey’s housed in the sanctuary along with their housing details.
6. Provides a shopping list which consists of favorite foods of the inhabitants of the sanctuary along with the quantity required.
7. Produces a sign for given enclosure which lists all the individual monkeys housed in the cage along with their name, sex, and favorite food.
8. The system shifts a monkey from isolation to enclosure when the monkey gets fit. It can also shift the monkey back to isolation from enclosure incase a medical attention is required.

## How to Run

1. Open Terminal
2. Navigate to where jar file is
3. Type the following: **java -jar .\Primates.jar**

## How to use the program

1. Pass the number of isolation and enclosures cages that the sanctuary can house in the sanctuary constructor
2. User can create a new primate by passing all the primate attributes: name, age, weight, food, food requirement, species, size, space requirement in **createNewPrimate()** method
3. If the user wants to change the medical condition of a monkey by using the **changeMedicalConditionOfMonkey()** method by passing true or false, true indicates that the monkey is healthy and false means that the monkey is unhealthy and needs to be shifted to isolation.
4. Get the alphabetical list of all the monkeys by using **getAlphabeticalListOfMonkeys()** method
5. Get Enclosure sign for any enclosure cage by passing the parameter- cage no in the methods **getEnclosureSign()**.
6. Get Shopping list of the favorite foods and its quantity by calling the method **getShoppingList**()
7. User can look up housing of the species by calling the method **lookUpSpecies()** and passing the species name as the parameter.
8. If the user wishes to expand the sanctuary by increasing the no of cages in isolation and enclosure, user can do that by calling **getIsolation().getHousing()** and **getEnclosure().getHousing().**
9. User can get the alphabetical list of all species along with their respective housing by calling **getalphabeticalSpeciesList()** method.

## Description of Examples

Run 1 – RUN 1.txt

1. Create new sanctuary with initial size of isolation 10 and enclosure 7.
2. Added 6 new monkeys, all monkeys directly added to isolation
3. Added a monkey with duplicate name, the monkey couldn’t be created because name is a primary key.
4. Printed alphabetical list of monkeys along with their respective housing
5. Changed medical condition of 3 monkeys to true making the monkey healthy, monkey is shifted to enclosure.
6. Printed alphabetical list of all monkeys again along with their respective housing
7. Enclosure sign for cage number 1, shows name, sex, favorite food of the monkey in enclosure
8. Shopping list of all monkeys with their favorite food and quantity
9. Alphabetical list of all species along with their housing
10. Look up housing details for species – Mangabey

**Run 2 – RUN 2.txt**

1. Create new sanctuary with initial size of isolation 2 and enclosure 2
2. Update size of sanctuary to 3, 3
3. Create 3 new monkeys
4. Printing alphabetical list of monkeys along with their housing
5. Tried to add one more 4th monkey, cannot add more monkey as size of isolation is only 3
6. Change the medical condition of a monkey in isolation to false, monkey not shifted as it is already in isolation
7. Tried to get enclosure sign for a non-existent cage, reports message that cage doesn’t exist
8. Printing shopping list of favorite foods along with their quantity
9. Look up species, which is not present, report the fact that species is not present in any housing.

**Run 3 – RUN 3.txt**

1. Creating a new sanctuary with initial size of enclosure and isolation as 2, 2.
2. Try to create monkey with negative age, doesn’t create monkey as age is negative
3. Try to create monkey with negative weight, doesn’t create monkey as weight is negative
4. Tries to create monkey with “ abc’ species, doesn’t create as species is invalid
5. Printing alphabetical list of all monkeys with their housing
6. Printing shopping list of monkeys with their favorite food and quantity
7. Alphabetical list of species with their housing
8. Look up housing details for a species
9. Look up housing details for a species that is not in sanctuary, report the fact that species is not in sanctuary.

## Design/Model Changes

1. Sanctuary Interface: Initially in the design sanctuary was a concrete class which would serve the purpose of getting housing and primate interface objects and calculating the shopping list, alphabetical list and other required outputs. In the new design, sanctuary is a class which implements Sanctuary Interface. To adhere to the design principle and achieve highest level of abstraction interface is created. Additionally, in future if a new type of sanctuary is added the system should be flexible to accommodate the changes.
2. Housing abstract class: Initial design included an abstract class for isolation and enclosure, in the new design isolation and enclosure class directly implement the housing interface. The abstract class was removed as the implementation for isolation and enclosure was different.
3. Enum for Sex and Housing: Initial design did not contain enumerations for gender and housing. It was added in the new design because each time a in instead of using a string that have precise value it is better design to use enumerations.
4. Added Monkey Factory method: Initial design did not contain a Monkey Factory which would take care of the different species object. It was added in the new design to get different type of species object. Factory method ensures that that the code is closed for extension but open fot modification.

## Assumptions

1. The size of space inside each enclosure is same and is fixed at 100 sq.m.
2. Assuming that the food requirement, size and space requirement of a monkey doesn’t change after it has been created.
3. Considering the name of the monkey as the primary key for the project.
4. Size of enclosure and isolation cannot be decreased than the initial declared value, it can only increase if the funds allow.

## Limitations

1. If enclosure is full and the monkey is healthy, the project cannot shift it to new sanctuary. It just reports the fact that “There is no space in enclosure, please check other sanctuaries.

## Citations

1. <https://howtodoinjava.com/java/sort/collections-sort/>
2. <https://www.baeldung.com/java-comparator-comparable>