By: Kyle Cheung

Problem 1. Zoo’s are not open 24/7. In addition, animals have unique sleeping schedules that affect when an exhibit can be open. How can we generate a complete schedule of when each exhibit is available each day?

Problem 2. Often times, animals are not kept in solitary confinement. Many animals can coexist and many thrive when sharing the same environment. How can we generate a list of exhibits such that we can minimize the number of exhibits needed for all animals?

Features of Database

To solve the first problem my database will store an animal’s regular sleep start and sleep end as fields and join that with the exhibits table and zoo hours table to query times when the zoo is open and the animal is awake.

2. each animal has the Boolean fields aggressive and solitary. In addition, they have a foreign key habitat\_id that specifies an animal’s original region and biome. My database will then use a procedure to generate an animalBelongsToExhibit table and will group animals if they belong to the same region and biome, and are non aggressive and non solitary.

Tables

|  |  |
| --- | --- |
| **Animal** | |
| Id | INT PRIMARY KEY |
| Species | VARCHAR(255) |
| Sleep\_start | TIME |
| Sleep\_end | TIME |
| Aggressive | BOOLEAN |
| Solitary | BOOLEAN |
| Habitat\_id | INT Foreign Key |
| ON DELETE SET NULL | |
| ON UPDATE CASCADE | |

|  |  |
| --- | --- |
| **Habitat** | |
| Id | INT PRIMARY KEY |
| Region | VARCHAR(255) |
| Biome | INT foreign key |
| ON DELETE SET NULL | |
| ON UPDATE CASCADE | |

|  |  |
| --- | --- |
| **Biome** | |
| Id | INT PRIMARY KEY |
| Biome | VARCHAR(255) |

|  |  |
| --- | --- |
| **AnimalBelongstoExhibit** (generated as a view from a procedure) | |
| Exhibit\_id | INT |
| Animal\_id | INT |

|  |  |
| --- | --- |
| **Exhibit** | |
| Id | INT PRIMARY KEY |
| Exhibit\_name | INT |

|  |  |
| --- | --- |
| **ZooHours** | |
| Id | INT PRIMARY KEY |
| Day\_of\_week | INT |
| Open\_time | TIME |
| Close\_time | TIME |

|  |  |
| --- | --- |
| **Log\_data\_zooHours\_update** | |
| Log\_Id | INT PRIMARY KEY |
| Action | VARCHAR(255) |
| zooHours\_id | VARCHAR(255) |
| Old\_day\_of\_week | TIME |
| New\_day\_of\_week | TIME |
| Old\_open\_time | TIME |
| New\_open\_time | TIME |
| Old\_close\_time | TIME |
| New\_close\_time | TIME |

|  |  |
| --- | --- |
| **AnimalBelongstoExhibit** | |
| Id | INT |
| Animal\_id | INT |

**Tools**

Function awakeAndOpen(animal, day) – returns the time when the animal is awake and the zoo is open

Procedure generateAnimalsBelongToExhibit – creates a View of which animals should belong to which exhibit since animals can move around between zoos.

Trigger log\_data\_zooHours – logs and changes to the zoos opening and closing hours

View – AnimalBelongsToExhibit – a view detailing which animals should be in which exhibits