BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to University of Mumbai)
[Knowledge is Nectar]
Department of Computer Engineering

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Batch: D

Aim:

Design Interactive Dashboards and Storytelling using using Power BI / Power BI / R / Python /D3.js on the dataset - Animal / Wildlife / Marine

- Basic - Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, Bubble plot, Advanced -
  Word chart, Box and whisker plot, Violin plot, Regression plot (linear and nonlinear), 3Dchart, Jitter.
- Write observations from each chart.

Theory:

Dataset:

https://www.kaggle.com/datasets/jaynadkarni/animal-classification

Dataset Description:

This dataset contains information on 101 animals from a zoo, spanning 16 variables that describe their characteristics. The primary goal is to predict the classification of animals into one of seven categories: Mammal, Bird, Reptile, Fish, Amphibian, Bug, or Invertebrate.

Columns Description:

1) animal_name: Unique identifier for each animal.
2) hair: Presence (1) or absence (0) of hair.
3) feathers: Presence (1) or absence (0) of feathers.
4) eggs: Laying (1) or not laying (0) eggs.
5) milk: Production (1) or non-production (0) of milk.
6) airborne: Ability (1) or inability (0) to fly.
7) aquatic: Living (1) or not living (0) in water.
8) predator: Predator (1) or non-predator (0) status.
9) toothed: Presence (1) or absence (0) of teeth.
10) backbone: Presence (1) or absence (0) of a backbone.
11) breathes: Ability (1) or inability (0) to breathe air.

12) venomous: Presence (1) or absence (0) of venom.

13) fins: Presence (1) or absence (0) of fins.

14) legs: Number of legs (0, 2, 4, 5, 6, 8).

15) tail: Presence (1) or absence (0) of a tail.

16) domestic: Domesticated (1) or non-domesticated (0) status.

17) catsize: Comparison to cat size (1: similar, 0: dissimilar).

18) type: Classification into one of seven animal classes (1-7):

1: Mammal

2: Bird

3: Reptile

4: Fish

5: Amphibian

6: Bug

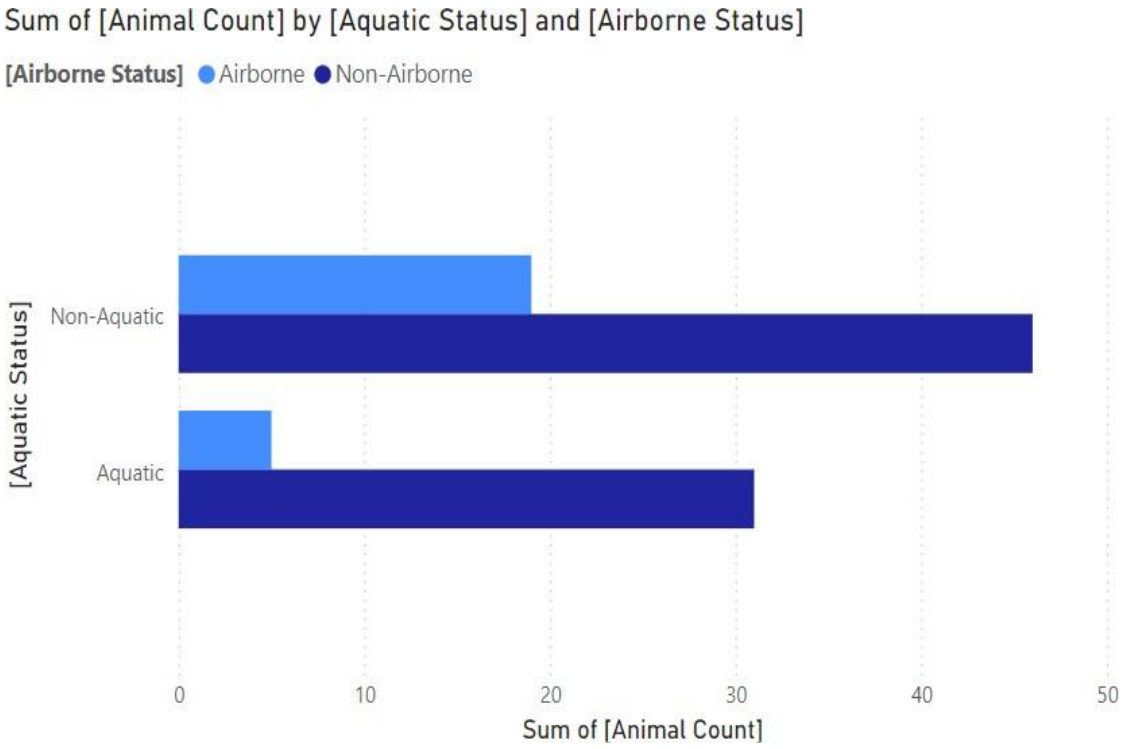
7: Invertebrate

Charts:

1. **Sum of Animal Count by Aquatic Status and Airborne Status:**
   a. **DAX Code:**

```
EVALUATE
SUMMARIZE
(
    Zoo,
    Zoo[aquatic],
    Zoo[airborne],
    "Aquatic Status", IF(Zoo[aquatic] = 1, "Aquatic", "Non-Aquatic"), "Airborne Status",
    IF(Zoo[airborne] = 1, "Airborne", "Non-Airborne"),"Animal Count",
    COUNT(Zoo[animal_name])
)
```

b. Chart:


Sum of [Animal Count] by [Aquatic Status] and [Airborne Status]
[Airborne Status] Airborne Non-Airborne
[Aquatic Status]
Non-Aquatic
Aquatic
0
10
20
30
40
50
Sum of [Animal Count]

c. **Observations:**

- **Non-Aquatic Animals Dominate**: The majority of animals in the dataset are not aquatic. This is evident from the longer bar representing the "non-aquatic" category compared to the "Aquatic"category.
- **Airborne Animals are Fewer**: Within both the aquatic and non-aquatic categories, there are fewer airborne animals. The blue bars, representing airborne animals, are shorter than the dark blue bars representing non-airborne animals.
- **Non-Aquatic Non-Airborne Animals are Most Numerous**: The largest number of animals falls into the category of being neither aquatic nor airborne. This is indicated by the longest dark blue bar.

In summary, this chart suggests that the zoo primarily houses terrestrial animals, with a smaller proportion of aquatic and airborne species.

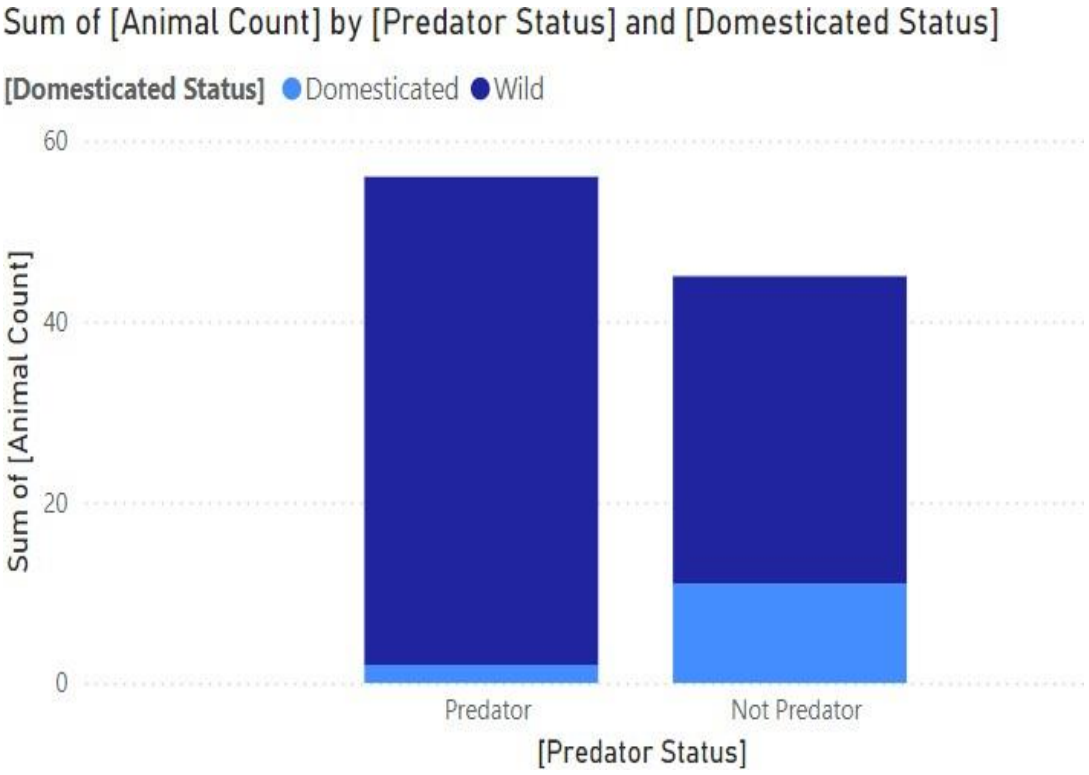
2. Sum of Animal Count by Predator Status and Domesticated Status:

a. DAX Code:

```
EVALUATE
SUMMARIZE
(
    Zoo,
    Zoo[predator],
    Zoo[domestic],
    "Predator Status", IF(Zoo[predator] = 1, "Predator", "Not Predator"), "Domesticated Status", IF(Zoo[domestic] = 1, "Domesticated", "Wild"), "Animal Count", COUNT(Zoo[animal_name])
)
```

b. Chart:

c. **Observations:**



c. **Observations:**

- **Predators are Primarily Wild:** The majority of predators in the zooare wild animals, as indicated by the taller dark blue bar in the "Predator" category.
- **Non-Predators are More Diverse:** The "Not Predator" category shows a more balanced distribution between domesticated and wild animals. While the wild animals still outnumber the domesticated ones,the difference is less pronounced.
- **Domesticated Animals are Mostly Non-Predators:** The majority of domesticated animals in the zoo are not predators, as evidenced by thelarger light blue bar in the "Not Predator" category.

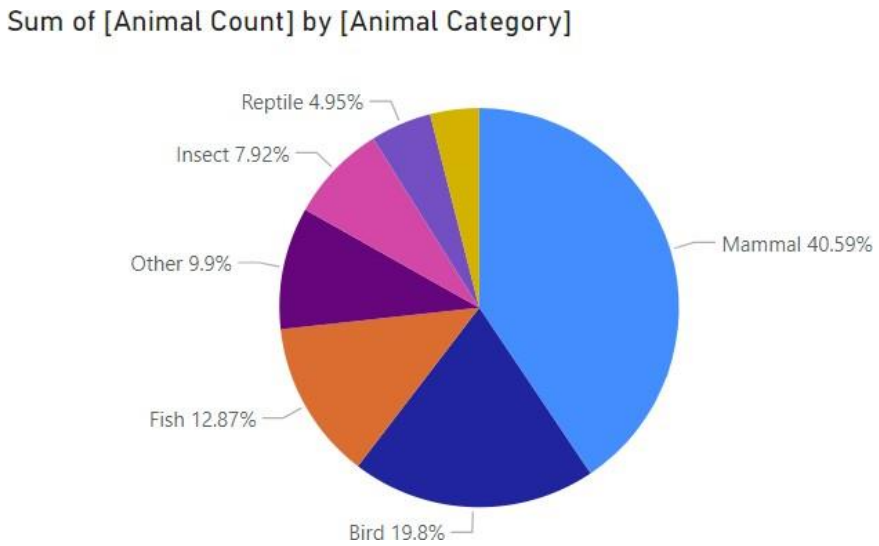
In summary, this chart suggests that the zoo has a higher proportion of wild predators compared to wild non-predators. Additionally, domesticated animalsin the zoo are predominantly peaceful species.

3. Sum of Animal Count by Animal Category:

a. DAX Code:

```
EVALUATE
SUMMARIZE
(
    zoo, zoo[class_type],
    "Animal Category",
    SWITCH(
        zoo[class_type],1,
        "Mammal",
        2, "Bird",
        3, "Reptile",
        4, "Fish",
        5, "Amphibian",
        6, "Insect",
        7, "Other"
    ),
    "Animal Count", COUNT(zoo[animal_name])
)
```

b. Chart:



c. Observations:

- **Mammals Dominate:** The largest proportion of animals in the zoo aremammals, making up nearly 41% of the total count.
- **Birds and Fish are Significant:** Birds and fish constitute a substantialportion of the zoo's population, with 19.8% and 12.87%, respectively.
- **Other Categories are Smaller:** Reptiles, insects, and other categorieseach account for less than 10% of the total animal count.

In summary, this chart highlights the zoo's focus on mammals while alsoshowcasing a diverse representation of various animal groups.

4. Comparison of Airborne and Non-Airborne:

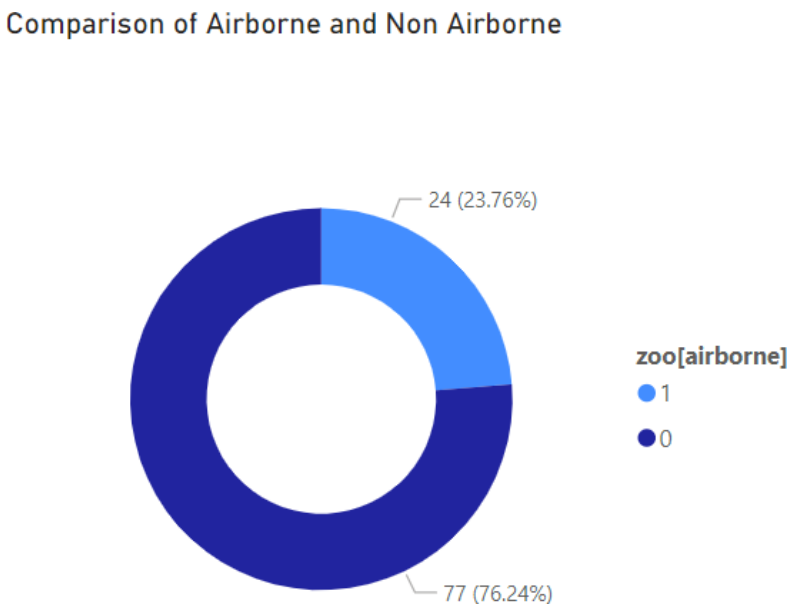
a. DAX Code:

```
EVALUATE
SUMMARIZE
(
    Zoo,
    Zoo[airborne],
    "Airborne Count", CALCULATE(COUNT(Zoo[animal_name]), Zoo[airborne] = 1),"Non-
```

b. Chart:

```
        Airborne Count", CALCULATE(COUNT(Zoo[animal_name]), Zoo[airborne] =
0)
)
```

b. Chart:



c. Observations:

- **Overwhelmingly Non-Airborne:** A significant majority of the animals in the zoo are not airborne, constituting 76.24% of the totalpopulation.
- **Small Proportion of Airborne Animals:** Only 23.76% of the animalsin the zoo are capable of flight.

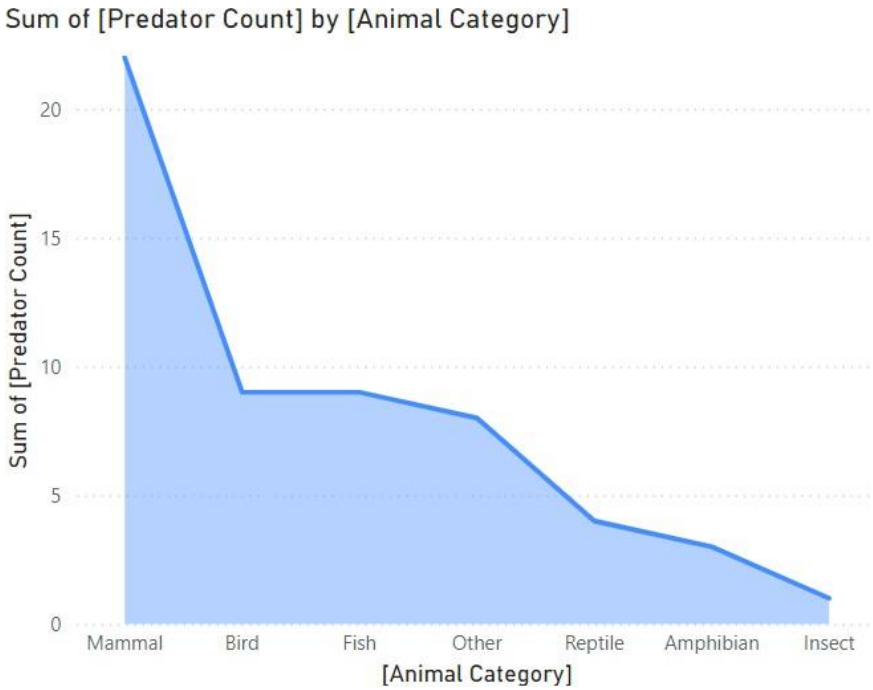
In summary, this chart highlights the predominance of non-airborne species inthe zoo's collection.

5. Sum of Predator Count by Animal Category:

a. DAX Code:

```
EVALUATE
SUMMARIZE
(
    Zoo,
    Zoo[class_type],
    "Predator Count", CALCULATE(COUNT(Zoo[animal_name]), Zoo[predator] = 1)
)
```

b. Chart:



c. Observations:

- **Mammals Have the Highest Predator Count:** Mammals exhibit thelargest number of predators, with a count significantly higher than other categories.
- **Birds and Fish Have Moderate Predator Counts:** Both birds andfish have a moderate number of predators, with their counts being relatively similar.
- **Reptiles, Amphibians, and Insects Have Low Predator Counts:** These categories show significantly lower predator counts compared tomammals, birds, and fish.

In summary, this chart suggests that mammals are the dominant predatorsin the zoo, while reptiles, amphibians, and insects have a much lower representation of predator species.

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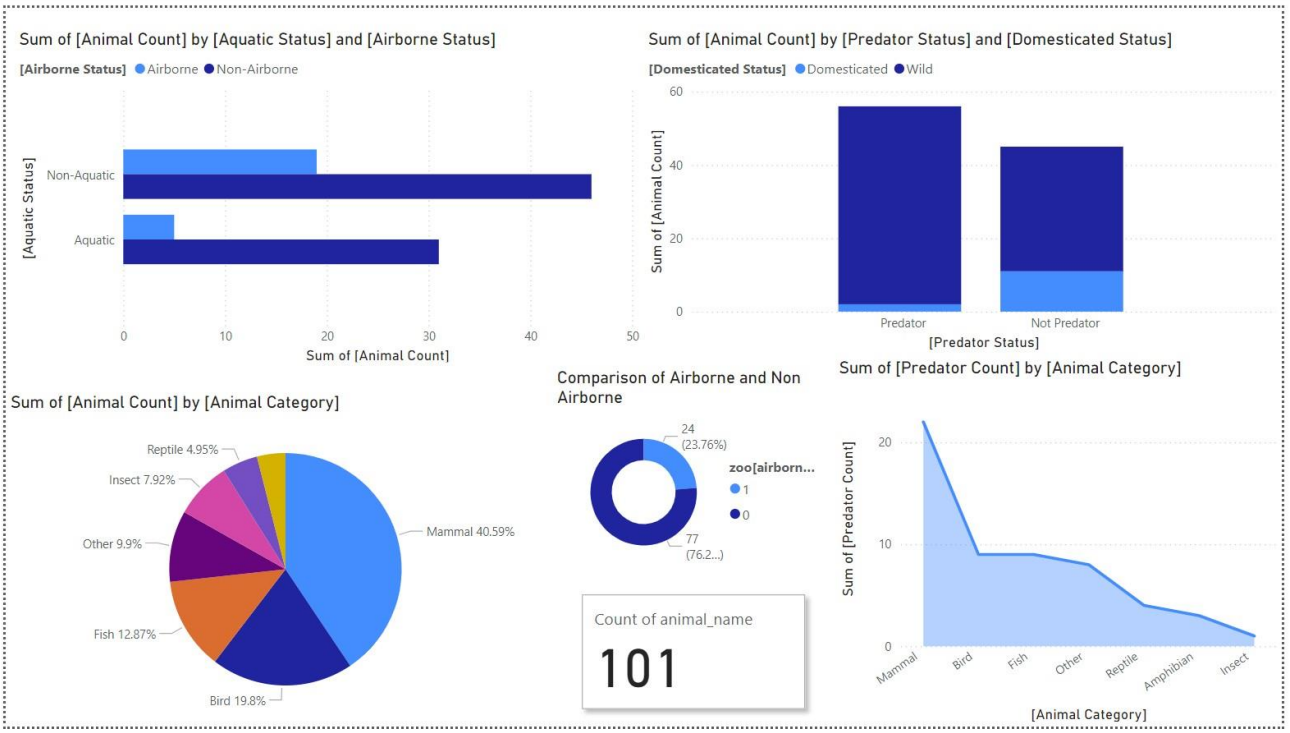
Dashboard:



Questions:

1) **Which animal category has the largest population in the zoo?**

Mammals comprise the largest group of animals in the zoo.

2) **What correlation exists between predator status and domestication among zoo animals?**

There is a strong inverse relationship between being a predator and being domesticated, indicating most predators are wild and most domesticated animals are non-predators.

3) **Compare the proportions of airborne and non-airborne animals.**

Non-airborne animals significantly outnumber airborne animals in the zoo.

4) **Identify the animal categories with the highest and lowest numbers of predators.**

Mammals have the highest number of predators, while insects have the fewest.

5) **Describe the distribution of animal counts by aquatic and airborne status.**

The zoo's animal population is predominantly non-aquatic, with a smaller subset of aquatic animals. Within both groups, airborne animals are relatively rare compared to their non-airborne counterparts.

Conclusion:

From this analytical experiment, I drew meaningful conclusions regarding the zoo's population dynamics, specifically: the preponderance of mammals, the prevalence of wild predators, and the limited presence of airborne and aquatic animals.

These insights underscore the zoo's dedication to diversity and provide a foundation for future research, informing strategic decisions on management and expansion.