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Experiment no.: 06
Aim: Using DAX queries create Interactive Dashboard for Marinelife /wildlife dataset.

Dataset:

Dataset Description:

This dataset contains records of various species with key information related to their population, habitat, physical characteristics, diet, conservation status, and average lifespan. It consists of 8 columns, and each record represents a different species. Here's a detailed breakdown of the dataset:

1. **Species**:
    - **Description**: The name of the species.
    - **Data Type**: Categorical (e.g., Lion, Tiger, Elephant, Giraffe).
    - **Example Values**: "Lion," "Tiger," "Elephant," "Giraffe."
2. **Population**:
    - **Description**: The total population count of the species in the wild.
    - **Data Type**: Numerical (Integer).
    - **Example Values**: 20,000 (Lion), 3,900 (Tiger), 600,000 (Elephant).
    - **Use**: Helps in analyzing species' survival and population distribution.
3. **Habitat**:
    - **Description**: The natural habitat where the species primarily lives.**Data Type**: Categorical (e.g., Savanna, Forest).
    - **Example Values**: "Savanna," "Forest.", “Grassland”
    - **Use**: Useful for visualizing species distribution based on geographic locations and environments.
4. **Weight (kg)**:
    - **Description**: The average weight of the species in kilograms.
    - **Data Type**: Numerical (Float).
    - **Example Values**: 190 kg (Lion), 220 kg (Tiger), 6000 kg (Elephant).
    - **Use**: Helps in understanding physical characteristics and comparing species' body mass.
5. **Height (cm)**:
    - **Description**: The average height of the species in centimeters.
    - **Data Type**: Numerical (Integer).
    - **Example Values**: 120 cm (Lion), 110 cm (Tiger), 500 cm (Giraffe).
    - **Use**: Useful for comparing the physical stature of different species.
6. **Diet**:
    - **Description**: The dietary category of the species (what it eats).
    - **Data Type**: Categorical (e.g., Carnivore, Herbivore).
    - **Example Values**: "Carnivore" (Lion, Tiger), "Herbivore" (Elephant, Giraffe).
    - **Use**: Helps classify species based on their food sources and ecological roles.
7. **Conservation Status**:
    - **Description**: The conservation status of the species as defined by the IUCN (International Union for Conservation of Nature).
    - **Data Type**: Categorical (e.g., Endangered, Vulnerable, Least Concern).
    - **Example Values**: "Vulnerable," "Endangered," "Least Concern."
    - **Use**: Indicates the risk level of extinction and helps in conservation efforts.

8. **Average Lifespan (years)**:
    - **Description**: The average lifespan of the species in years.
    - **Data Type**: Numerical (Integer).
    - **Example Values**: 12 years (Lion), 15 years (Tiger), 60 years (Elephant).
    - **Use**: Provides insight into the longevity of species and life expectancy in the wild.

DAX queries:

1. Total Population

This query calculates the total population of all species in the dataset.

```
Total Population = SUM(Wildlife[Population])
```

2. Average Weight by Diet

This query calculates the average weight of species based on their diet type (Carnivore, Herbivore, Omnivore).

```
Average Weight by Diet
=AVERAGEX(
    VALUES(Wildlife[Diet]),
    CALCULATE(AVERAGE(Wildlife[Weight (kg)]))
)
```

3. Count of Species by Conservation Status

This query counts the number of species in each conservation status category.

```
Count of Species by Conservation Status =
COUNTROWS(GROUPBY(Wildlife, Wildlife[Conservation Status]))
```

4. Average Lifespan by Habitat

This query calculates the average lifespan of species grouped by their habitat.

```
Average Lifespan by Habitat =
AVERAGEX(
    VALUES(Wildlife[Habitat]),
    CALCULATE(AVERAGE(Wildlife[Average Lifespan (years)]))
)
```

5. Species Count by Habitat

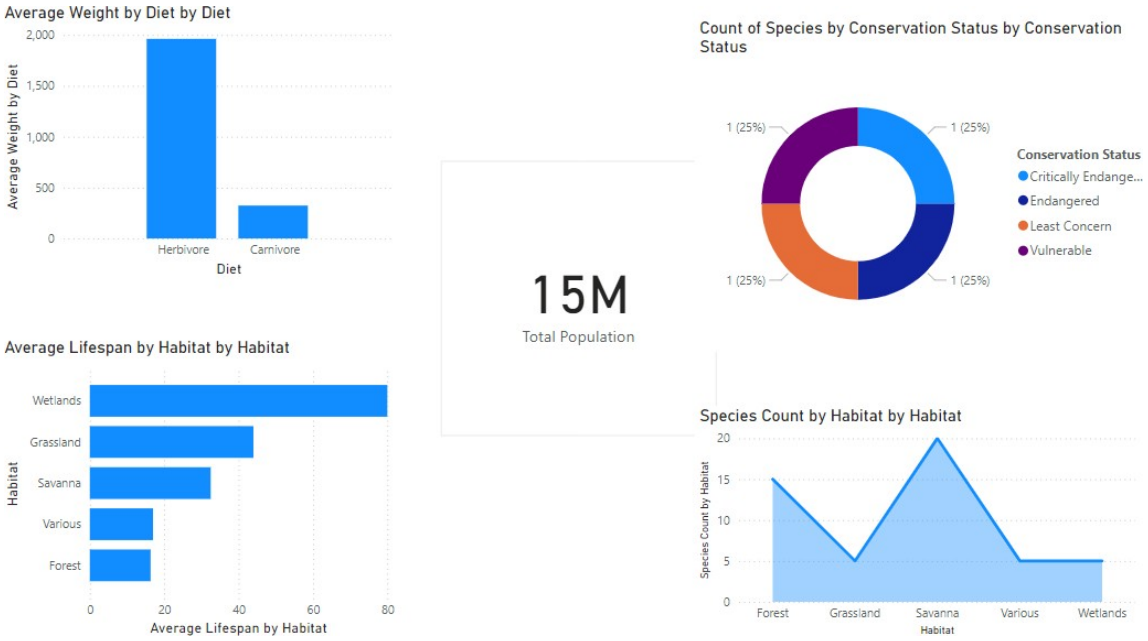
This query counts the number of species in each habitat type.

```
Species Count by Habitat =
CALCULATE(
    COUNTROWS(Wildlife),
    VALUES(Wildlife[Habitat])
)
```

Using the DAX Queries

You can use these DAX expressions in tools like Power BI or Excel to create visuals. For example:

- **Total Population** is displayed as a card visualization.
- **Average Weight by Diet** is represented as a bar chart.
- **Count of Species by Conservation Status** is shown as a pie chart.
- **Average Lifespan by Habitat** is visualized as a column chart.
- **Species Count by Habitat** is depicted as a stacked bar chart.



Observations:

Here are the observations for each visualization based on your dashboard:

1. **Total Population (Card Visualization)**:
    - The total wildlife population represented in the dataset is 15 million. This number could reflect a few large species (e.g., elephants) making up the bulk of the

population, indicating the need for balanced conservation efforts.

2. **Average Weight by Diet (Bar Chart)**:
    - Herbivores have a significantly higher average weight compared to carnivores, which reflects the inclusion of large herbivores such as elephants and giraffes in the dataset. This may suggest that herbivorous species in this dataset tend to be larger-bodied.
3. **Count of Species by Conservation Status (Pie Chart)**:
    - The species are evenly distributed across four conservation statuses: Critically Endangered, Endangered, Vulnerable, and Least Concern, with each status accounting for 25%. This shows a balanced representation of species across various risk levels, highlighting the importance of conservation for all.
4. **Average Lifespan by Habitat (Column Chart)**:
    - Species residing in wetlands exhibit the highest average lifespan, while those in forests and varied habitats tend to have shorter lifespans. This could suggest that certain habitats like wetlands offer more favorable conditions for longevity.
5. **Species Count by Habitat (Stacked Bar/Line Chart)**:
    - Savanna has the highest species count, followed by grassland and forest, with wetlands and various habitats having fewer species. This shows that savanna habitats in the dataset support a more diverse range of species compared to others.

Conclusion:

In this Experiment, we explored the power of DAX queries to derive meaningful insights from a wildlife dataset, focusing on calculating averages, counts, and totals. We used DAX to create custom measures, such as *Average Weight by Diet*, *Species Count by Habitat*, and *Total Population*. These calculations were crucial in setting the foundation for visualizing key trends and patterns within the data.