Project Report: Austin Animal Shelter Intake Analysis

1. Introduction

Animal shelters play a crucial role in managing stray, abandoned, and surrendered animals within a city. Understanding the intake patterns of animals can help improve shelter management, adoption strategies, and overall animal welfare.
This project, **"Austin Animal Shelter Intake Analysis,"** aims to explore and analyze the intake data of animals received by the Austin Animal Shelter to identify key patterns and insights.

2. Objectives

The main objectives of this project are:

- To clean, preprocess, and analyze the animal intake dataset.
- To identify trends in animal intake based on type, condition, and gender.
- To examine seasonal (monthly) patterns in shelter intakes.
- To visualize data using Python libraries for better understanding and storytelling.
- To derive insights that can assist in shelter operations and decision-making.

3. Dataset Description

The dataset used in this project was obtained from **Kaggle's "Austin Animal Shelter" dataset**. The data includes information about animals received by the Austin Animal Center.

Dataset Files:

- aac_intakes.csv — Animal intake data used for this analysis.

Key Columns:

Column Name	Description
Animal ID	Unique identifier for each animal
Name	Name of the animal (if available)
DateTime	Date and time of intake
MonthYear	Month and year of intake

Column Name	Description
Found Location	Where the animal was found
Intake Type	Reason for intake (Stray, Owner Surrender, etc.)
Intake Condition	Health condition upon intake
Animal Type	Type of animal (Dog, Cat, Bird, etc.)
Sex upon Intake	Sex and sterilization status
Age upon Intake	Age at the time of intake
Breed	Breed of the animal
Color	Color description

4. Tools and Technologies Used

- **Language:** Python
- **Libraries:**
    - Pandas – for data cleaning and manipulation
    - Matplotlib – for static visualizations
    - Seaborn – for advanced, aesthetic plots
- **Environment:** Jupyter Notebook

5. Methodology

Step 1: Data Loading and Inspection

The dataset was loaded using Pandas, and initial inspection was performed using:

intake_df.info()

intake_df.isnull().sum()

Missing values were identified and handled appropriately.

Step 2: Data Cleaning

- Trimmed column names and removed leading/trailing spaces.
- Converted DateTime to datetime format.

- Extracted Month from DateTime for time-based analysis.

Step 3: Exploratory Data Analysis (EDA)

a. Count of Animals by Type

Bar chart showing the count of each animal type (Dogs, Cats, Birds, etc.).

b. Count by Intake Type

Visualized different intake reasons such as Stray, Owner Surrender, Public Assist, etc.

c. Count by Intake Condition

Displayed the health condition of animals upon arrival (Normal, Sick, Injured, etc.).

d. Monthly Intake Trend

Line plot showing animal intakes across months to identify seasonal variations.

e. Top 10 Breeds

Bar chart highlighting the most common breeds in the shelter.

f. Gender Distribution

Analyzed gender distribution after creating a new column Gender derived from Sex upon Intake.

6. Results and Insights

📊 **Key Observations:**

- **Dogs and Cats** are the most common animals entering the shelter.
- **Stray** is the most frequent intake type, followed by **Owner Surrender**.
- Most animals are received in **Normal condition**, while a smaller proportion are **Sick or Injured**.
- Monthly trend analysis revealed **fluctuations across months**, suggesting possible seasonal patterns.
- The **Top 10 Breeds** included common domestic breeds, indicating shelter overrepresentation of popular pets.
- **Gender distribution** was nearly balanced, with slight variation depending on species.

7. Conclusion

This project provided a comprehensive understanding of animal intakes at the Austin Animal Shelter.
Through data visualization and exploration, key insights were identified that could assist shelter management in resource allocation, medical planning, and adoption campaigns.

Future improvements could include:

- Combining the intake dataset with the outcomes dataset for a full analysis of adoption and return rates.
- Implementing predictive models to forecast shelter population trends.

8. References

- Kaggle: Austin Animal Shelter Dataset
- Python Official Documentation
- Seaborn & Matplotlib Visualization Guides