ANIMAL DETECTION AND ALERTING SYSTEM

PROJECT REPORT

Submitted By

ASHIK K J
ASI20CA016

EDWIN MARTIN
ASI20CA028

GAURI A
ASI20CA030

Under the guidance of

Prof RoseMary Varghese

in partial fulfilment of the requirements for the award of the degree of

Bachelor of Technology

In

Computer Science and Engineering(Artificial Intelligence)

ADI SHANKARA INSTITUTE OF ENGINEERING & TECHNOLOGY
JUNE 2023

CERTIFICATE

Certified that this is a bonafide record of the mini project entitled

“ANIMAL DETECTION AND ALERTING SYSTEM”

Submitted By

ASHIK K J
ASI20CA016

EDWIN MARTIN
ASI20CA028

GAURI A
ASI20CA030

during the year 2022-23 in partial fulfilment of the requirement for the

award of the degree of

Bachelor of Technology in Computer Science and Engineering(Artificial Intelligence)

Internal Guide External Supervisor

Project Coordinator Head of the Department

ACKNOWLEDGEMENT

We have taken a lot of effort to build this project. However, completing this project would not have been possible without the support and guidance of a lot of individuals. We would like to extend our sincere thanks to our Principal **Dr. Sreepriya S** , **Prof. P.V. Rajaraman** Head of Department, Computer Science And Engineering And Mini Project Coordinators **T Sobha** and **Vydehi S**. We are highly indebted to **Prof. RoseMary Varghese** for her guidance and supervision. We would like to thank her for providing the necessary information and resources for this project. We would like to express our gratitude towards all teaching and non-teaching staff of AI & CSE Department , parents ,friends , well wishers and Almighty for their kind cooperation and encouragement which help us a lot in completing this project. Our thanks and appreciations also go to our colleagues in developing the project. Thank you to all the people who have willingly helped us out with their abilities.

ABSTRACT

This project report focuses on the development and implementation of an animal detection and alarm system using the YOLOV5 platform. The primary objective of the system is to detect the presence of animals in specific areas and trigger an alarm to alert users.The project utilises computer vision techniques and machine learning algorithms to analyse real-time video feeds captured by the YOLOV5 camera. Image processing techniques are applied to the video frames to identify potential animal objects, which are then classified using a trained machine learning model.The system is designed to efficiently and accurately detect a wide range of animals, including both domestic and wildlife species. The integration of the YOLOV5 platform provides enhanced processing power and capabilities, allowing for real-time analysis and quick response to animal presence.The implemented animal detection and alarm system holds great potential in various applications such as wildlife conservation, farm protection, and urban safety. By providing timely and reliable alerts, it contributes to reducing human-animal conflicts, preventing property damage, and enhancing overall situational awareness.

CONTENTS

LIST OF FIGURES

INTRODUCTION

In today's world, the detection and monitoring of animals in specific areas have become increasingly important for various applications such as wildlife conservation, farm protection, and urban safety. The ability to accurately detect the presence of animals and provide timely alerts can help mitigate risks and prevent potential conflicts between humans and animals.

This project report focuses on the development and implementation of an animal detection and alert system using the YOLOV5 platform. The YOLOV5 platform provides advanced capabilities and processing power, making it an ideal choice for real-time analysis of video feeds.

The implications of this animal detection and alert system are significant. In the context of wildlife conservation, the system can aid in monitoring and protecting endangered species. In agricultural settings, it can help prevent crop damage by detecting and deterring animals. Additionally, in urban areas, the system can enhance safety by alerting authorities or residents about potentially dangerous animal encounters.

LITERATURE SURVEY

Introduction

The literature survey section of this project report provides an overview of existing research, studies, and publications related to animal detection and alarm systems. This section aims to establish a foundation of knowledge and understanding in the field, highlighting the current state-of-the-art techniques, methodologies, and advancements in this domain.Animal detection and alarm systems have gained significant attention due to their importance in various applications such as wildlife conservation, farm protection, and urban safety. The ability to accurately detect and monitor animals in specific areas plays a crucial role in mitigating human-animal conflicts, preventing property damage, and ensuring the safety of both humans and animals.This literature survey delves into key research works that have explored different aspects of animal detection and alarm systems. It examines studies related to computer vision techniques, machine learning algorithms, and image processing methods employed for animal detection. Additionally, it investigates the utilisation of different sensor technologies, such as cameras, to capture and analyse real-time data for animal detection purposes.

The survey also explores the challenges and limitations associated with animal detection systems, such as the presence of occlusions, variations in lighting conditions, and the diversity of animal species. It reviews the existing methodologies for addressing these challenges, including feature extraction techniques, classification algorithms, and fusion of multiple sensors.Furthermore, this literature survey discusses the significance of the YOLOV5 platform in the context of animal detection and alarm systems.By reviewing and analysing the existing literature, this survey aims to identify gaps, trends, and opportunities for further research and improvement in the field of animal detection and alarm systems. The insights gained from this survey will inform the methodology and approach taken in the subsequent sections of this project report.

Literature survey

- The study by Fang et al. [1] focuses on a technique for animal detection that leverages global patterns of pixel motion. The researchers utilized a dataset where animals exhibit noticeable movement against the background. Optical flow techniques were applied to estimate motion vectors for each pixel, enabling the identification of regions with significant motion.
- Nguyen, H., et al. [3] investigated a main obstacle to scientists and ecologists to monitor wildlife in an open environment. Leveraging on recent advances in deep learning approaches in computer vision, a framework was introduced to build automated animal recognition in the wild, aiming at an automated wildlife monitoring system

- In the study conducted by Zhang et al. [8], the researchers aimed to leverage computer vision approaches to aid in the study of kangaroos in their natural habitat. To assess the feasibility of their proposed methodology, they constructed a kangaroo image dataset using data collected from various national parks in the State of Queensland.
- Kumar and Singh [11] presented a cost-effective system for monitoring pet animals, specifically dogs, by utilising their primary animal biometric identifiers. The study focused on recognizing and classifying dogs based on their facial features using one-shot similarity and distance metric-based learning approaches.
- In their research, Rey et al. [19] explored a semi-automatic system designed for detecting large mammals in a semi-arid Savanna environment. The system leveraged machine learning techniques and was trained using crowd-sourced annotations obtained from volunteers. These annotations were derived from manual interpretation of sub-decimeter resolution colour images.

COMPARISON OF VARIOUS IMAGES AND VIDEOS BASED OBJECT DETECTION TECHNIQUES

Ref No	Title	Attributes (species)	Merits	Demerits	Performance metrics
[1]	Animal Detection from Traffic Scenarios Based on Monocular Color Vision	Based on SVM classifier, test number is 1 to 10	Highly accurate classifier	The static size of region delimiter box	Test number = 6 True positive (left facing animal) = 95%
[2]	Motion Based Animal Detection in Aerial Videos	zebras and antelope	Global pixel motion difference between the animal and the background.	In this approach, more effective local threshold selection methods are not used	Species = zebras False positive = 2.03% False Negative = 11.39%
[3]	Animal Recognition and Identification with Deep Convolutional Neural Networks for Automated Wildlife Monitoring	Bird, Rat, Bandicoot, Rabbit, Mouse, Cat etc.	Robust, stable and suitable for dealing with images captured from the wild	Low accuracy	Six most common species Training 80% images Validation 20% images Model = Lite AlexNet Accuracy = 82.49% F-measure = 81.40%
[4]	Classification of Wild Animals Based on SVM and Local Descriptors	Wild boar, brown bear, wolf, fox and deer	Promising results comparable with other key point detectors	Poor results with success rate of classification around 50% only	Classification success rate = 86%
[5]	Detecting animals in African Savanna with UAVs and the crowds	Kuzikus dataset	High recall rate	Low precision value	1) Detection Scores = 100 True positive rate = 0.85 False positive rate = 0.3 2) Detection Scores = 300 True positive rate = 0.84 False positive rate = 0.3

DESIGN

Functional requirements

User Interfaces

The animal detection and alerting system will require several user interfaces to support its various functions. The following are the key user interfaces required for this project:

● Dashboard Interface: This interface will provide a high-level overview of the system's performance and status. It will include visualizations of detected animal movements, alerts, and system health. The dashboard will display current and historical data and allow users to customize the view and settings.

● Alert Interface: This interface will provide details of animal detection events, including species and location information, and provide users with options to acknowledge or dismiss alerts. The interface will also allow users to configure alert settings and customize the alert notification channels.

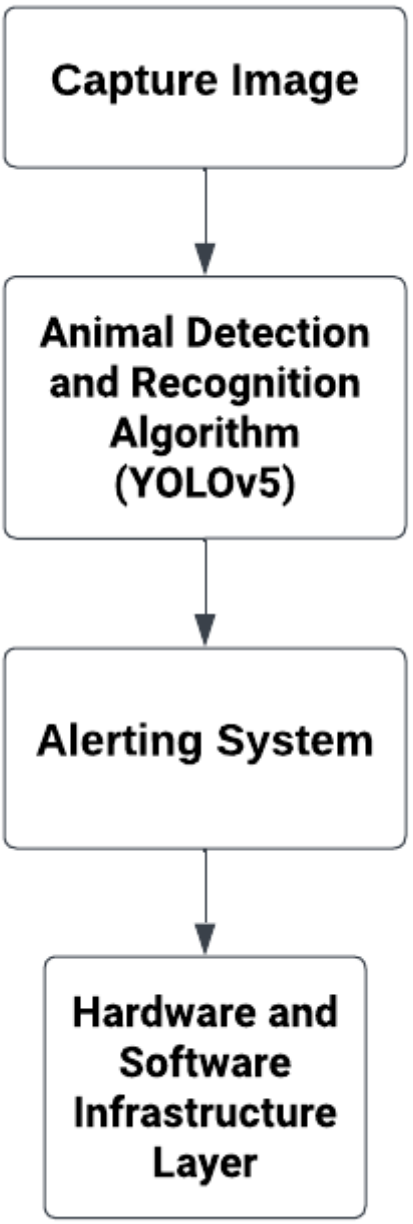
● Configuration Interface: This interface will enable users to configure system settings and parameters. Users will be able to set up detection zones, define species-specific detection rules, and configure alert settings. The interface will include options to save, load, and export configuration files.

● Data Management Interface: This interface will enable users to manage data generated by the system, including recorded animal movement data, detected event data, and system logs. The interface will allow users to search and filter data, export data to external formats, and delete data.

● Help and Support Interface: This interface will provide users with access to documentation, tutorials, and support resources. It will include a search function, a FAQ section, and options to contact technical support.

Architecture Diagram

Figure 1

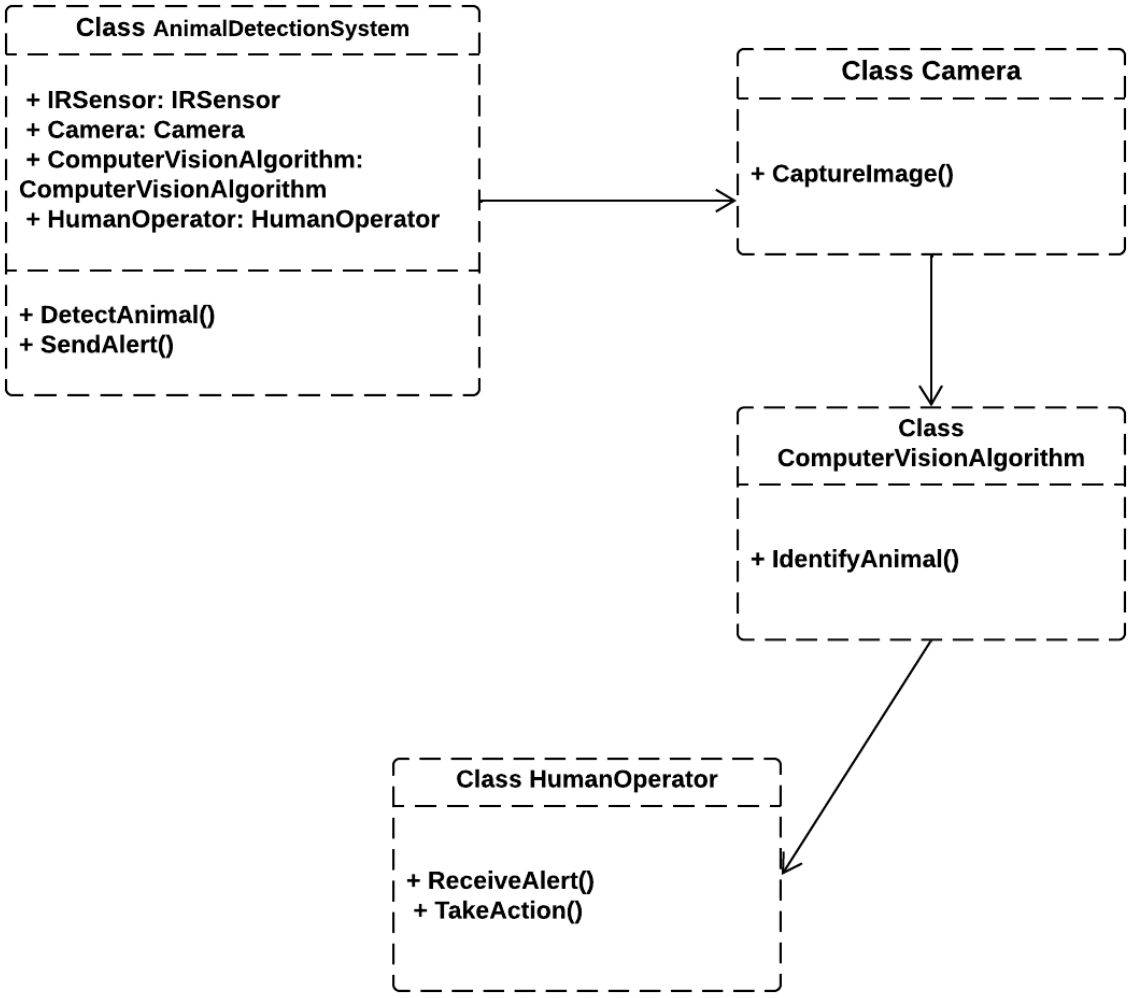


Use case diagram

Figure 2

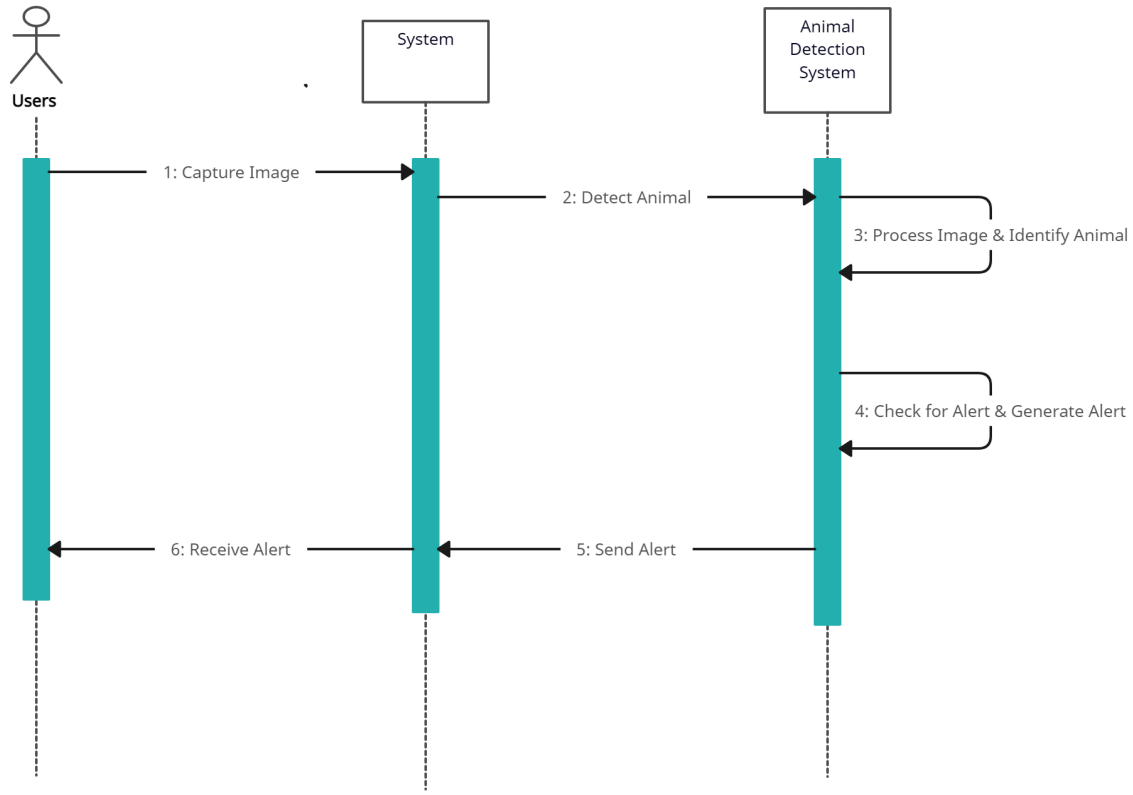
Class Diagram

Figure 3



Sequence Diagram

Figure 4



SOFTWARE/HARDWARE REQUIREMENTS

RAM: Allocate sufficient RAM to ensure smooth operation of the system. A minimum of 2GB RAM is recommended, but more RAM may be needed depending on the size of the dataset and concurrent user activity.

CPU: YOLOV5 would benefit from a multi-core CPU to handle concurrent requests and perform computationally intensive tasks efficiently. Consider a system with at least a quad-core CPU (4vCPUs) or higher.

Storage: Allocate sufficient storage space to accommodate the system's database, application files, images, and any additional data. The storage requirements may vary depending on the size of the dataset and the number of images or media files stored. A minimum of 25GB of storage space is recommended.

Network Connectivity: Ensure a stable internet connection to allow communication with external services (e.g., geolocation, notification services) and enable real-time data synchronization.

Authentication and Authorization Libraries: To implement user sign-up, login, and user-specific functionalities, you may need to integrate authentication and authorization libraries like Passport.js, JSON Web Tokens (JWT), or similar tools. Install and configure the required libraries as per your project's needs.

Natural Language Processing Libraries: If your system involves natural language processing tasks, you may need to install relevant libraries like Natural Language Toolkit (NLTK), spaCy, or others. Install the required libraries using the package installer for Python (e.g., pip or conda) and configure them accordingly.

Additional Libraries and Modules: Depending on the specific features and functionalities of YOLO V5, you may require additional libraries and modules such as image processing libraries (e.g., OpenCV), notification services (e.g., Twilio, Firebase Cloud Messaging), or geolocation services. Install and integrate these libraries as per your project's requirements.

TEST PLAN

Objective:

The objective of this test plan is to ensure that the Animal Identification and Alerting System functions as intended, meets the requirements, and performs reliably. It covers various aspects of the system, including user management, animal identification, alerting, and data management.

Test Scope:

The test scope includes the following areas of the Animal Identification and Alerting System:

User SignUp and Login
User Profile Management
Animal Identification and Tracking
Alerting System
Database Management

Test Phases:

3.1. Unit Testing:

Perform unit tests on individual components, functions, and modules of the system to ensure their correctness and functionality. This includes testing user registration, login, database operations, and other isolated functionalities.

3.2. Integration Testing:

Conduct integration tests to verify the proper interaction and integration between different components and modules of the system. Test the flow of data and functionalities between user management, animal identification, alerting, and database components.

3.3. System Testing:

Perform end-to-end testing of the entire Animal Identification and Alerting System to validate its behavior and functionality as a whole. Test various user scenarios, animal identification processes, and alerting system responses to ensure proper functioning and accuracy.

3.4. Performance Testing:

Assess the system's performance under various loads and stress conditions. Measure response times, resource utilization, and system stability during peak usage periods. Identify and resolve any performance bottlenecks or issues.

3.5. Security Testing:

Evaluate the security aspects of the system, including user authentication, data privacy, and protection against common security vulnerabilities. Test for potential vulnerabilities like SQL injection, cross-site scripting (XSS), and ensure secure data transmission.

Test Cases:

4.1. User SignUp and Login:

Test user registration with valid and invalid inputs.
Test duplicate username prevention during registration.
Test successful login with correct credentials.
Test failed login with incorrect credentials.
Test password encryption and decryption.

4.2. User Profile Management:

Test updating user profile information (e.g., name, email, profile picture).
Test password change functionality.
Test profile visibility settings and access control.

4.3. Animal Identification and Tracking:

Test animal identification process with various image inputs.
Test accurate identification of known animals.
Test identification failure scenarios and error handling.
Test tracking and updating animal location and data.

4.4. Alerting System:

Test alert generation and notification based on predefined rules.
Test alert delivery mechanisms
Test alert acknowledgment and resolution.

4.5. Database Management:

Test proper data storage and retrieval from the database.
Test data integrity and consistency.
Test database backup and restoration processes.
Test Environment:
Define the test environment, including hardware, software, and network configurations, necessary for conducting the tests. Ensure that the test environment closely resembles the production environment.

Test Execution:

Execute the defined test cases, record the results, and track any issues or defects found. Perform regression testing as necessary.

Test Reporting:

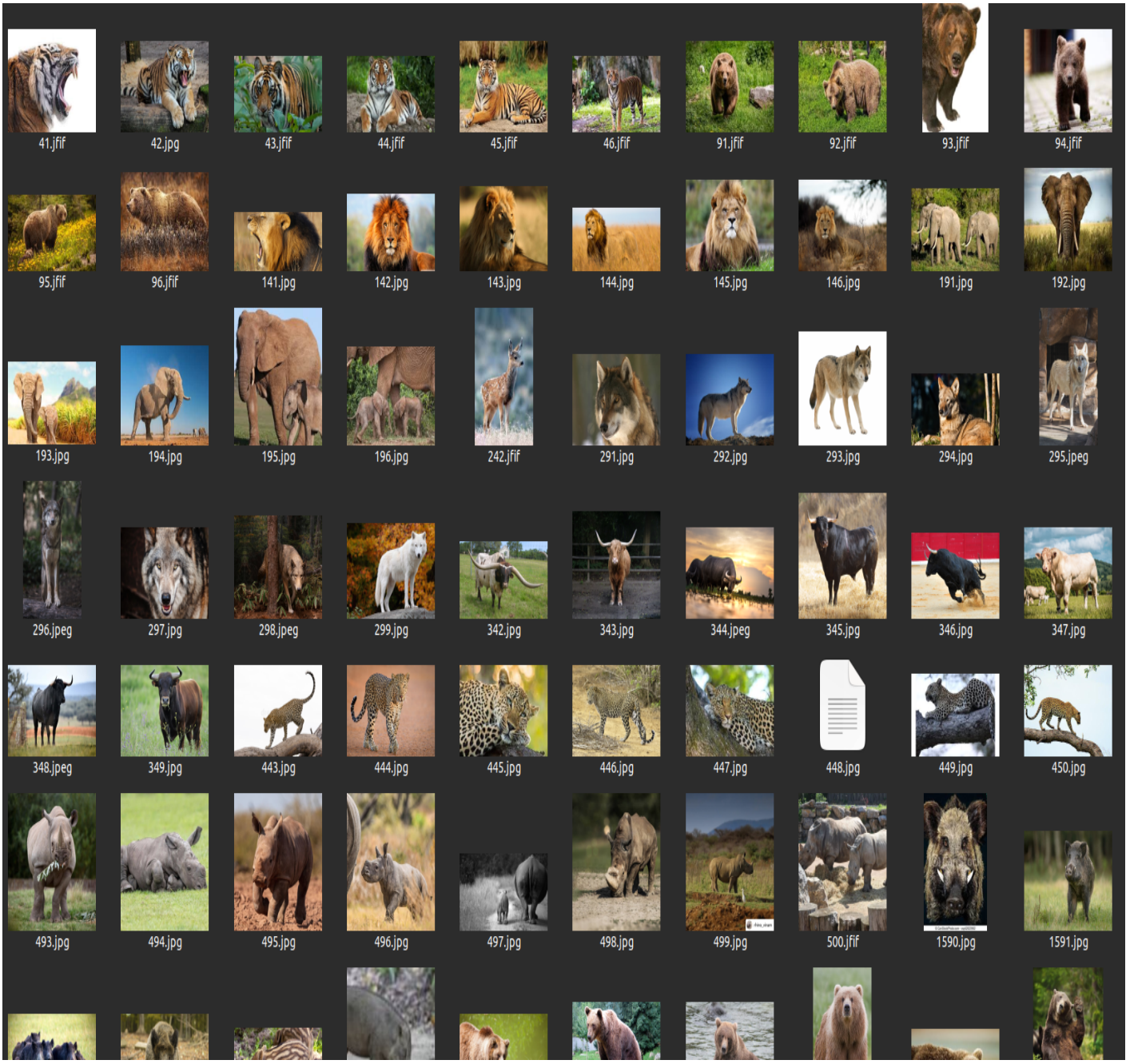
Prepare comprehensive test reports documenting the test results, including test coverage, test execution details, identified issues, and their resolutions.

Test Schedule and Resources:

Define the schedule for conducting the tests, allocate resources (including testing personnel and test environments), and manage the overall testing process.

Note: This is a general outline for a test plan for the Animal Identification and Alerting System. Adjustments and additions may be required based on the specific requirements, features, and complexity of your project.

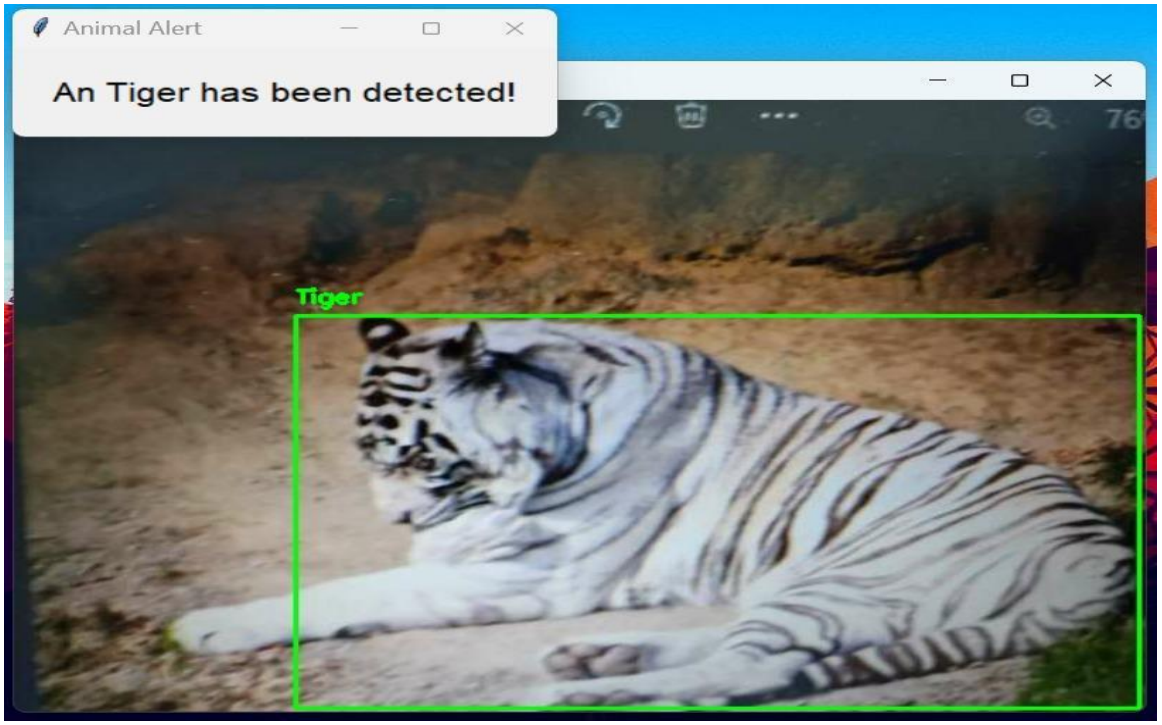
SAMPLE IMAGE DATASET



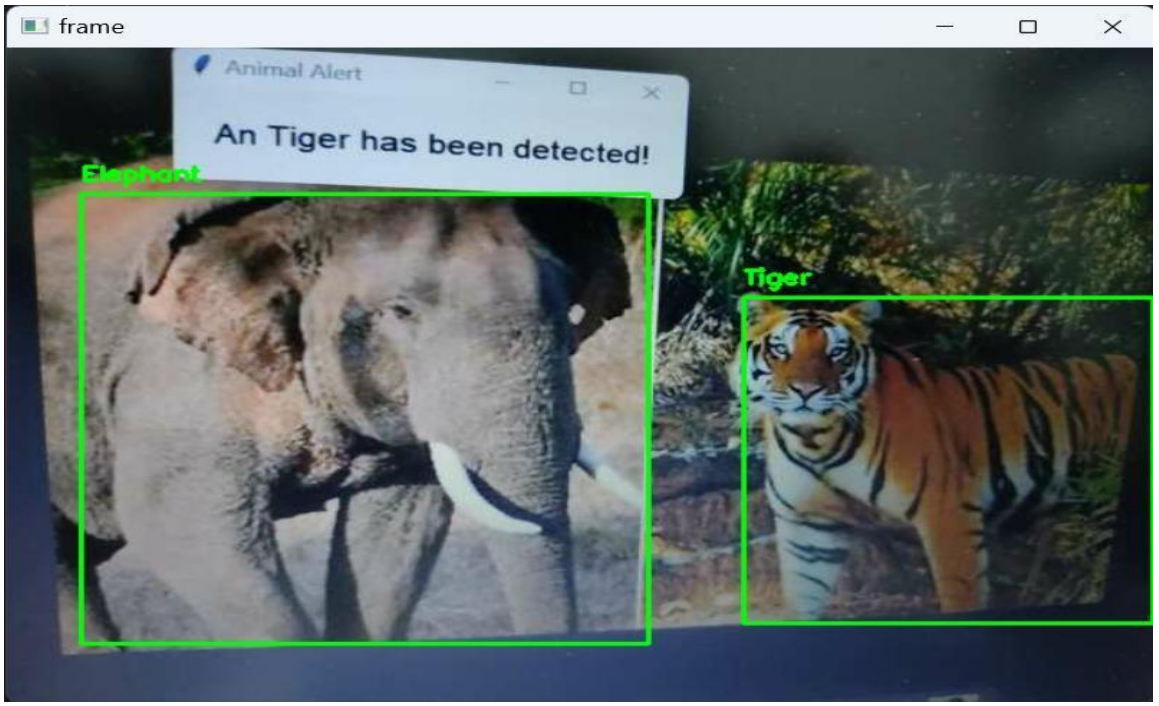
RESULT

The Model predicts the output Correctly

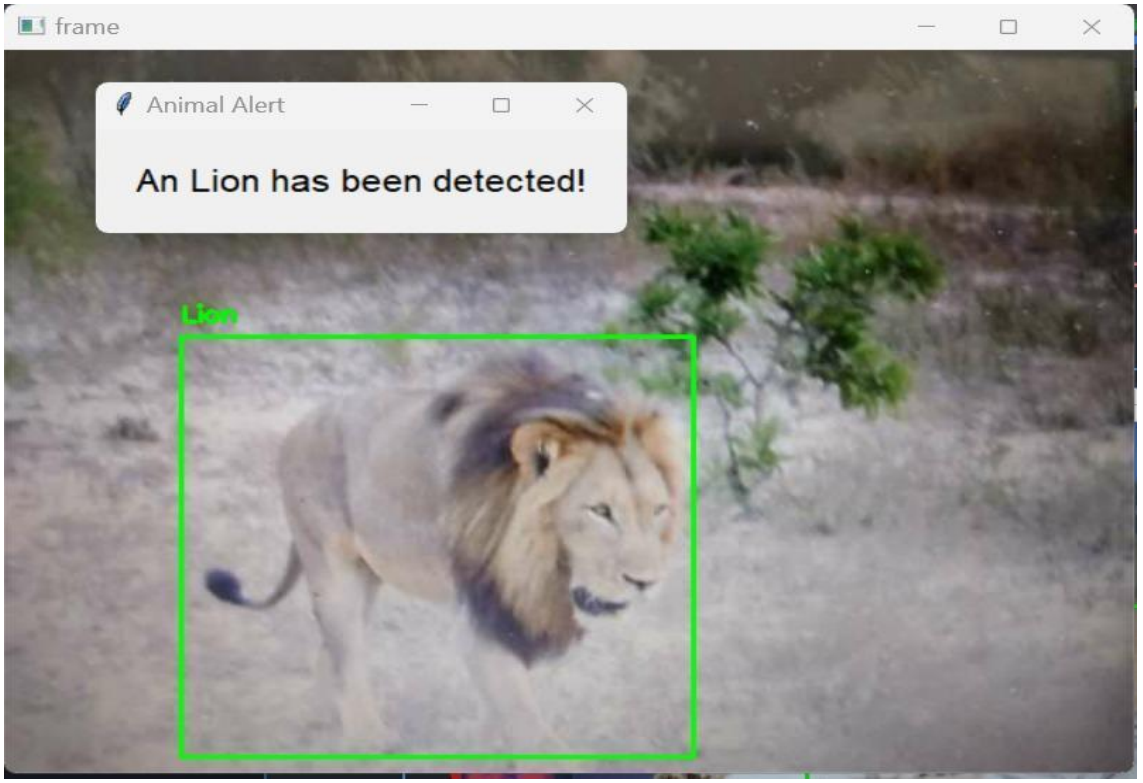
=>The Model Predicts the tiger correctly and also made Alerting sound.



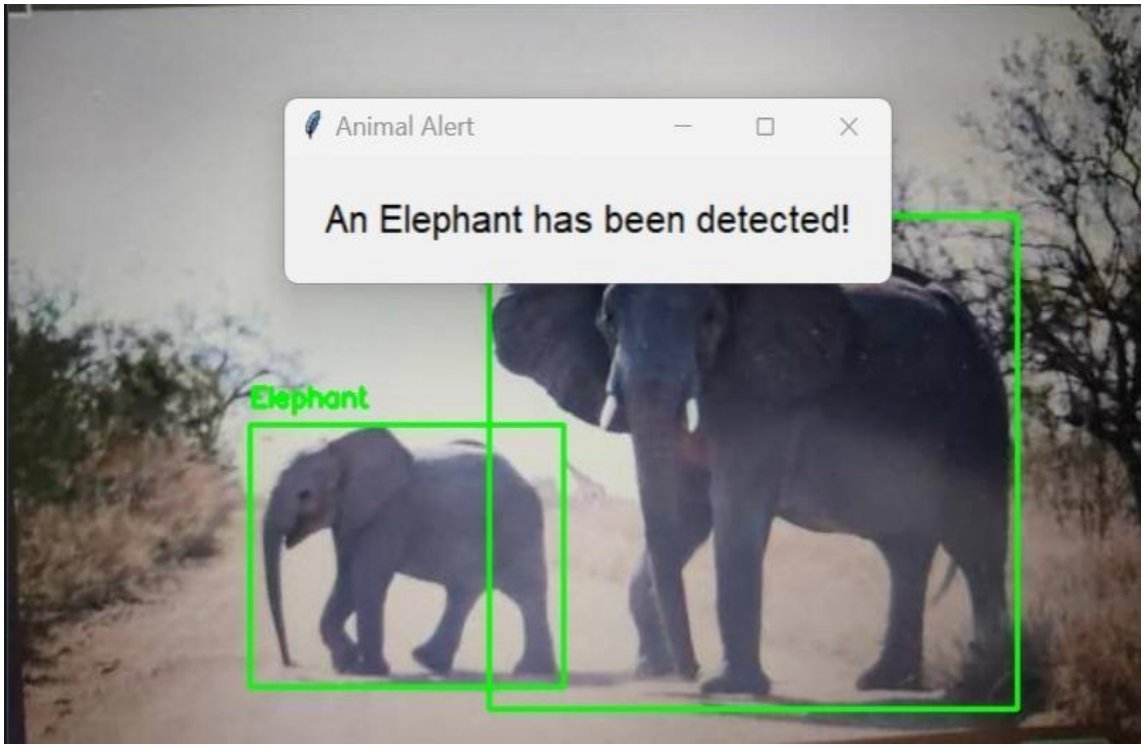
=>The Model Predicts the tiger and Elephant correctly at same time and also made Alerting sound.



=>The Model Predicts the lion correctly and also made Alerting sound

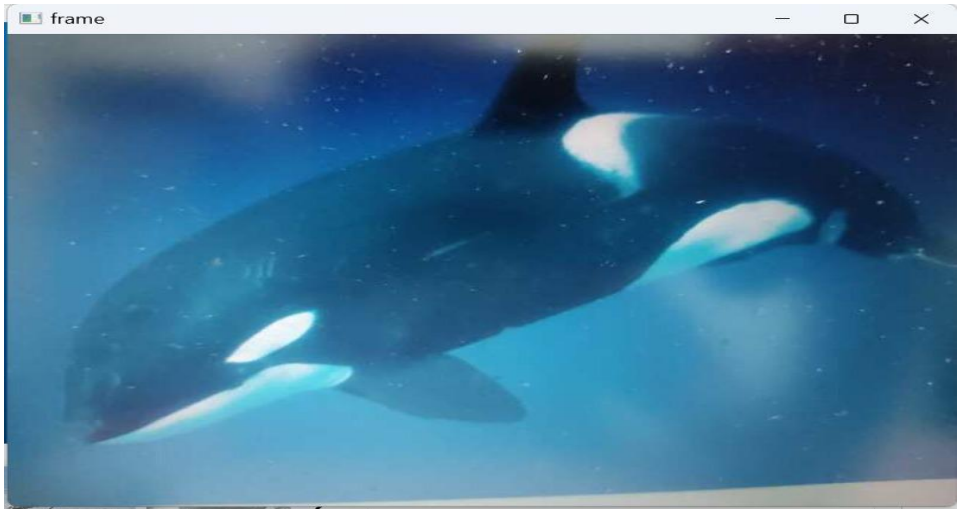


=>The Model Predicts the2 elephnants correctly and made Alerting sound

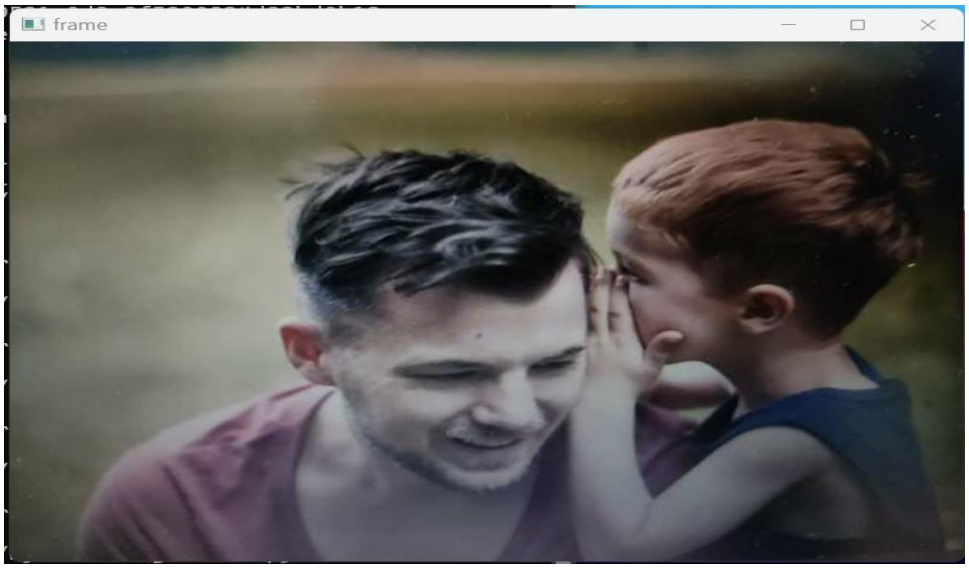


The Model working fine with untrained/normal images

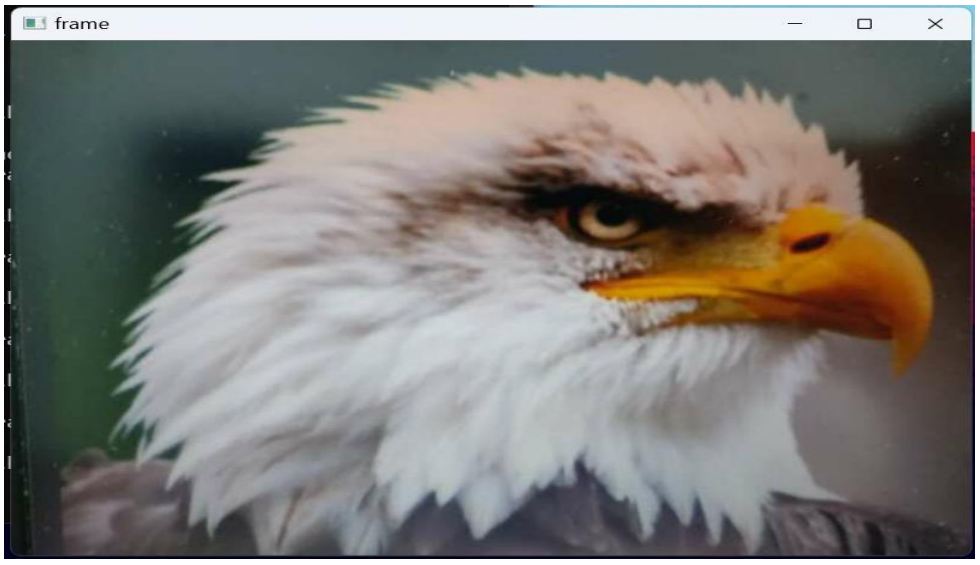
=>The Model don’t Predicts anything by seeing this whales image.



=>The Model don’t Predicts anything by seeing this image of peoples.



=>The Model don’t Predicts anything by seeing this eagles image.

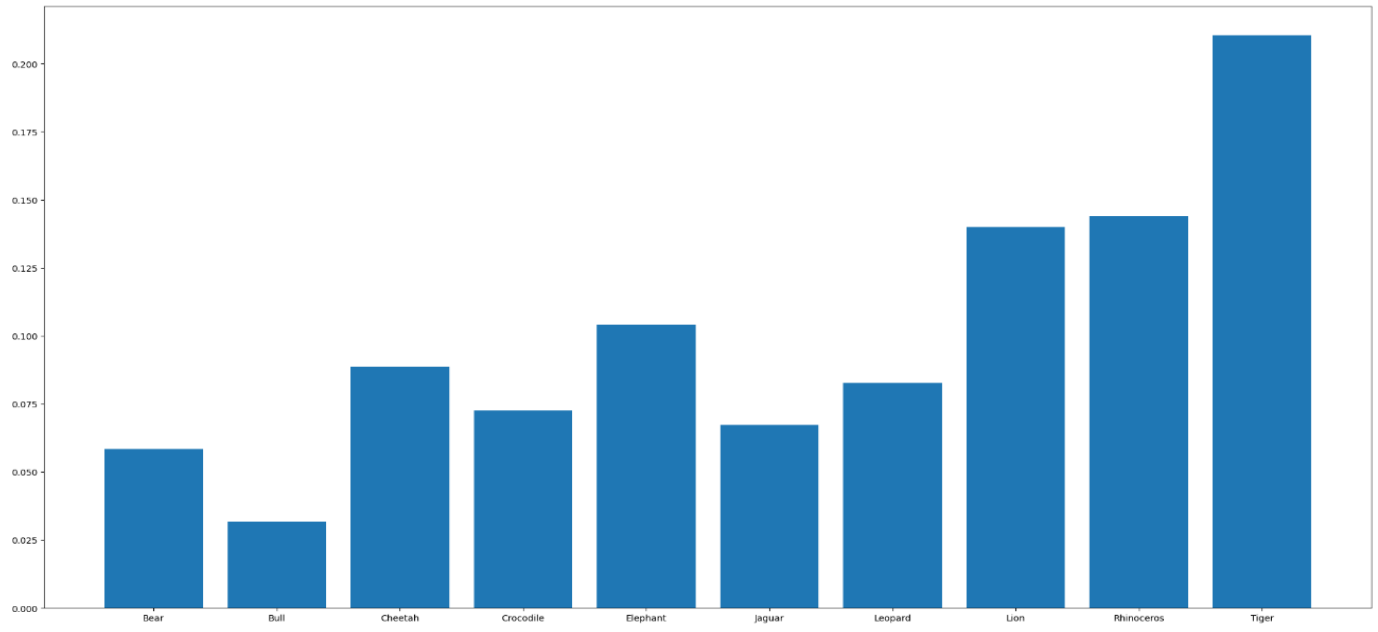


SOURCE CODE

```
# Mount Google Drive to access files and folders
from google.colab import drive
drive.mount('/content/drive')

# Downloads and extracts a dataset from Kaggle to a specific directory in Google Drive
# Run this command only once during the initial execution to download the dataset #
This command downloads a large dataset (10GB) and stores it in the drive, which may
fill up the storage faster
!export KAGGLE_USERNAME=ashikkj && export KAGGLE_KEY=a00c6b7418ecbb0299d5007cddd7c6ad
&& kaggle datasets download antoreepjana/animals-detection-images-dataset --unzip -p
/content/drive/MyDrive/MyAnimalsDataset

# Importing necessary libraries and modules for image processing, deep learning, and
visualization
import os import cv2 as cv import glob as gb import numpy as np
import pandas as pd
import matplotlib.pyplot as plt from tensorflow.keras.applications.inception_v3
import InceptionV3 from tensorflow.keras
import Model, layers, Sequential, optimizers from tensorflow.keras.callbacks
import ModelCheckpoint from tensorflow
import keras from tensorflow.keras
import callbacks, layers, Model
import cv2 import matplotlib.pyplot as plt
import matplotlib.image as mpimg
import re

# Setting the directories for the training and testing datasets
train_dir= '/content/drive/MyDrive/MyAnimalsDataset/train'
test_dir= '/content/drive/MyDrive/MyAnimalsDataset/test'

# Calculating and displaying the sample sizes of different animal categories in the
training dataset and visualizing the distribution
train_image_bear =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Bear"))-1
train_image_bull =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Bull"))-1
train_image_cheetah =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Cheetah"))-1
train_image_crocodile =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Crocodile"))-1
train_image_elephant =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Elephant"))-1
train_image_jaguar =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Jaguar"))-1
train_image_leopard =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Leopard"))-1
train_image_lion =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Lion"))-1
train_image_rhinoceros =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Rhinoceros"))-1
train_image_tiger =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/train/Tiger"))-1
print("Bear sample size : ",train_image_bear,"\n")
```

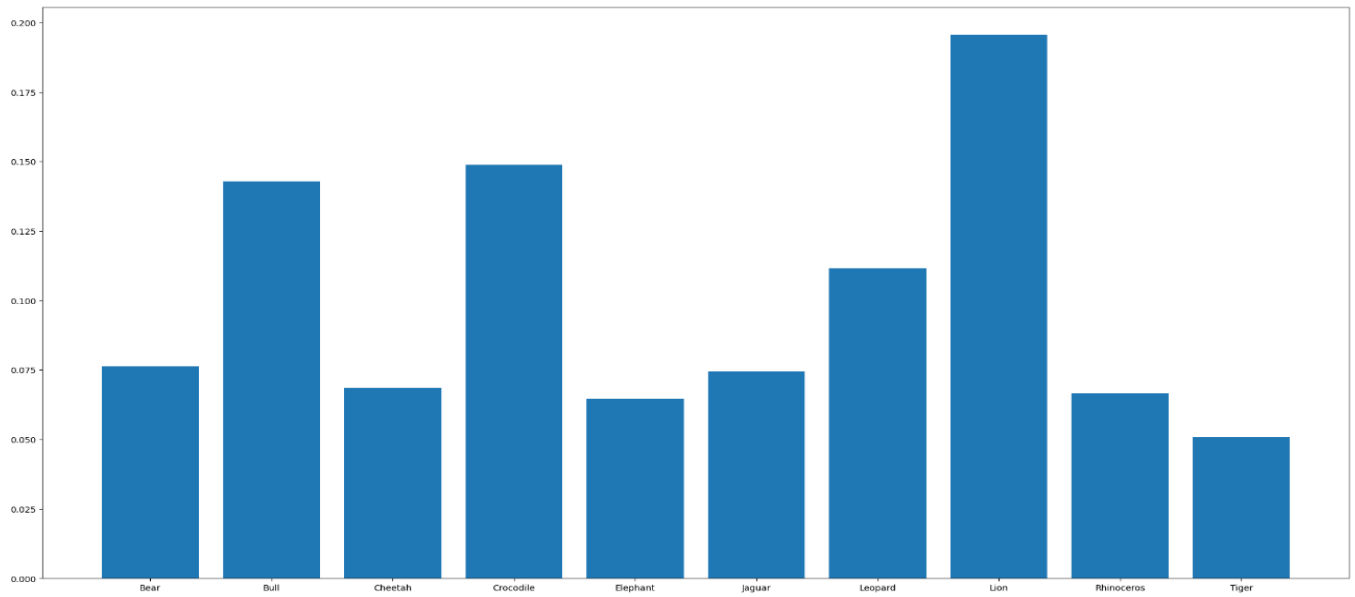
```
print("Bull sample size : ",train_image_bull,"\n")
print("Cheetah sample size : ",train_image_cheetah,"\n")
print("Crocodile sample size : ",train_image_crocodile,"\n")
print("Elephant sample size : ",train_image_elephant,"\n")
print("Jaguar sample size : ",train_image_jaguar,"\n")
print("Leopard sample size : ",train_image_leopard,"\n")
print("Lion sample size : ",train_image_lion,"\n")
print("Rhinoceros sample size : ",train_image_rhinoceros,"\n")
print("Tiger sample size : ",train_image_tiger,"\n")
training_data_size =
train_image_bear+train_image_bull+train_image_cheetah+train_image_crocodile+train_imag
e_elephant+train_image_jaguar+train_image_leopard+train_image_lion+train_image_rhinoce
ros+train_image_tiger
occurences = [train_image_bear/training_data_size ,train_image_bull/training_data_size
,train_image_cheetah/training_data_size ,train_image_crocodile/training_data_size
,train_image_elephant/training_data_size
,train_image_jaguar/training_data_size,train_image_leopard/training_data_size,train_im
age_lion/training_data_size,train_image_rhinoceros/training_data_size,train_image_tige
r/training_data_size]
print("training data size :",training_data_size)
fig = plt.figure(figsize=[20,10]) ax = fig.add_axes([0,0,1,1])
ax.bar(["Bear","Bull","Cheetah","Crocodile","Elephant","Jaguar","Leopard","Lion","Rhin
oceros","Tiger"],occurences)
```

```
Bear sample size :  87

Bull sample size :  47

Cheetah sample size :  132

Crocodile sample size :  108

Elephant sample size :  155

Jaguar sample size :  100

Leopard sample size :  123

Lion sample size :  208

Rhinoceros sample size :  214

Tiger sample size :  313

training data size : 1487
```



```
# Calculating and displaying the sample sizes of different animal categories in the
testing dataset and visualizing the distribution
test_image_bear =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Bear"))-1
test_image_bull =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Bull"))-1
test_image_cheetah =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Cheetah"))-1
test_image_crocodile =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Crocodile"))-1
test_image_elephant =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Elephant"))-1
test_image_jaguar =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Jaguar"))-1
test_image_leopard =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Leopard"))-1
test_image_lion =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Lion"))-1
test_image_rhinoceros =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Rhinoceros"))-1
test_image_tiger =
len(os.listdir("/content/drive/MyDrive/MyAnimalsDataset/test/Tiger"))-1
print("Bear sample size : ",test_image_bear,"\n")
print("Bull sample size : ",test_image_bull,"\n")
print("Cheetah sample size : ",test_image_cheetah,"\n")
print("Crocodile sample size : ",test_image_crocodile,"\n")
print("Elephant sample size : ",test_image_elephant,"\n")
print("Jaguar sample size : ",test_image_jaguar,"\n")
print("Leopard sample size : ",test_image_leopard,"\n")
print("Lion sample size : ",test_image_lion,"\n")
print("Rhinoceros sample size : ",test_image_rhinoceros,"\n")
print("Tiger sample size : ",test_image_tiger,"\n")
validation_data_size =
test_image_bear+test_image_bull+test_image_cheetah+test_image_crocodile+test_image_elephant+test
_image_jaguar+test_image_leopard+test_image_lion+test_image_rhinoceros+test_image_tiger
occurences = [test_image_bear/validation_data_size ,test_image_bull/validation_data_size
,test_image_cheetah/validation_data_size ,test_image_crocodile/validation_data_size
,test_image_elephant/validation_data_size
,test_image_jaguar/validation_data_size,test_image_leopard/validation_data_size,test_image_lion/
validation_data_size,test_image_rhinoceros/validation_data_size,test_image_tiger/validation_data
_size]
print("validation data size:",validation_data_size)
fig = plt.figure(figsize=[20,10]) ax = fig.add_axes([0,0,1,1])
ax.bar(["Bear","Bull","Cheetah","Crocodile","Elephant","Jaguar","Leopard","Lion","Rhinoceros","T
iger"],occurences)
```

```
Bear sample size :  39

Bull sample size :  73

Cheetah sample size :  35

Crocodile sample size :  76

Elephant sample size :  33

Jaguar sample size :  38

Leopard sample size :  57

Lion sample size :  100

Rhinoceros sample size :  34

Tiger sample size :  26

validation data size: 511
```




```
# Defining a list of animal categories to detect
animals_to_detect = ["Bear","Bull","Cheetah","Crocodile","Elephant","Jaguar",
"Leopard","Lion","Rhinoceros","Tiger"]

# Creating directories for organizing YOLO training and testing data
os.mkdir("yolo")
os.mkdir("yolo/test")
os.mkdir("yolo/test/images")
os.mkdir("yolo/test/labels")
os.mkdir("yolo/train")
os.mkdir("yolo/train/images")
os.mkdir("yolo/train/labels")


# Preprocessing and resizing images for YOLO training and testing
size = (640,640)
for animal_specie in animals_to_detect:
 image_file_name = os.listdir(train_dir+"/"+animal_specie)
 for i in range(0,len(image_file_name)):
  if image_file_name[i] != "Label":
   img = cv2.imread(train_dir+"/"+animal_specie+"/"+image_file_name[i],
cv2.IMREAD_COLOR)
   img = cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
   img = cv2.resize(img, size)
   cv2.imwrite("yolo/train/images/"+image_file_name[i], img)
 image_file_name = os.listdir(test_dir+"/"+animal_specie)
 for i in range(0,len(image_file_name)):
  if image_file_name[i] != "Label":
   img = cv2.imread(test_dir+"/"+animal_specie+"/"+image_file_name[i],
cv2.IMREAD_COLOR)
   img = cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
   img = cv2.resize(img, size)
   cv2.imwrite("yolo/test/images/"+image_file_name[i], img)

# Defining a list of animal categories to detect and their corresponding encodings
animals_to_detect = ["Bear","Bull","Cheetah","Crocodile","Elephant","Jaguar",
"Leopard","Lion","Rhinoceros","Tiger"]
animals_encoding = {"Bear":0,"Bull":1,"Cheetah":2,"Crocodile":3,"Elephant":4,
```

```
"Jaguar":5,"Leopard":6,"Lion":7,"Rhinoceros":8,"Tiger":9}

# Processing labeling files to generate output files with encoded bounding box
coordinates
def process_files(input_files_path, output_files_path):
 for animal_specie in animals_to_detect:
 print(animal_specie)
 txt_file_name = os.listdir(input_files_path + "/" + animal_specie + "/Label")
 print(txt_file_name)
 for i in range(0, len(txt_file_name)):
  with open(input_files_path + "/" + animal_specie + "/Label/" + txt_file_name[i],
"r") as source:
   with open(output_files_path + "/" + txt_file_name[i], "w") as destination
    image_file_name_no_ext = txt_file_name[i][0:len(txt_file_name[i])-4]
    img = cv2.imread(input_files_path + "/" + animal_specie + "/" +
image_file_name_no_ext + ".jpg", cv2.IMREAD_COLOR)
    height = img.shape[0]
    width = img.shape[1]
    for line in source:
     labeling_data = line.split()
     labeling_data =
list(re.findall(r"(\w+)\s+(\d+\.\d+)\s+(\d+\.\d+)\s+(\d+\.\d+)\s+(\d+\.\d+)",line)[0])
     label = labeling_data[0].strip()
     if label in animals_encoding:
      labeling_data[0] = animals_encoding[label]
      xmin = float(labeling_data[1])
      ymin = float(labeling_data[2])
      xmax = float(labeling_data[3])
      ymax = float(labeling_data[4])
      cx = (xmin + xmax) / 2.0 / width
      cy = (ymin + ymax) / 2.0 / height
      box_width = (xmax - xmin) / width
      box_height = (ymax - ymin) / height
      destination.write(str(labeling_data[0]) + " ")
      destination.write(str(cx) + " ")
      destination.write(str(cy) + " ")
      destination.write(str(box_width) + " ")
      destination.write(str(box_height) + "\n")

# Processing the labeling files in the training dataset and generating output files
with encoded bounding box coordinates in the "yolo/train/labels" directory
process_files("/content/drive/MyDrive/MyAnimalsDataset/train","yolo/train/labels")
```

```
Bear
['0155b267ade95d1e.txt', '01650042709e7a82.txt', '02d4376234375c2f.txt', '02f783a758aec795.txt', '0312356c607c20dc.txt', '04af
0dc0511cb98d.txt', '04e79e5f419a711a.txt', '0594ed3b52d3c222.txt', '05d7d61e5e8a8169.txt', '060e6719ae46dea6.txt', '06707f5787
21048c.txt', '073f21a5b0fa62dc.txt', '079e864735144122.txt', '07e64bb137734dbf.txt', '082849a1549c56b7.txt', '0a85e62973f2bcf
6.txt', '0beb68cc85f20f4c.txt', '0c00c86cca098160.txt', '0c367abe78cbcf6d.txt', '0cb082f518f55fc3.txt', '0e656ab17f715b23.tx
t', '0e908c10c31c54d5.txt', '0fb433aa35b7d44a.txt', '112076aeba9d4d0c.txt', '1131287683bc922c.txt', '12543cb664a87734.txt', '1
27ce2dec6c6978f.txt', '15d276d673cf5de5.txt', '17aa9d00d16ef360.txt', '17b4237cafa91eb3.txt', '17c823ab5eeb6a69.txt', '19ae56c
c2d93a9bf.txt', '1aa1ff24b8e00fc1.txt', '20500caecb550ddf.txt', '217b1cf5a47223cc.txt', '26cf30a2c11b09ed.txt', '28094041a4a51
400.txt', '28730164e406e4ac.txt', '29581b154cf9ef55.txt', '2e2e26a9c8d4c609.txt', '34d2f34ce7edc12c.txt', '4307ec32a084163f.tx
t', '44339a383ae2f533.txt', '48f7992c2ca04cde.txt', '4a7d2a3ca0e06cc0.txt', '4be18442d17215fd.txt', '4fcee0e067c2cd53.txt', '5
26d3340a62cc182.txt', '53e34697e8388f42.txt', '57394d6bc851c7d2.txt', '61bd08bf28568de6.txt', '6277c2c08c535b67.txt', '6343fc5
2e49e1ed5.txt', '65542a47741ca6ed.txt', '696de3eab44a8126.txt', '6ec6d8ddcce0de4f.txt', '6fb63629b7fb60e0.txt', '7a72a21bee79c
2ed.txt', '802756ba8e33514b.txt', '81ac4dbf3af47945.txt', '8295c6e00769b5ef.txt', '830f57e8dbcf0e97.txt', '8da0dbb30f0d014a.tx
t', '9066fc143e2f4c73.txt', '9349c168e4d53ff3.txt', '9a663969742ef91e.txt', 'a4ff38e2e94ba6bc.txt', 'a711032b9d297f9b.txt', 'a
83ad97990e53c79.txt', 'a95191730e75bfce.txt', 'abe460e38bf1bbc9.txt', 'b5f0c5ae29283020.txt', 'b9b2344fd7c64652.txt', 'ba7742d
b0fad1f8f.txt', 'c34089874e38e8dc.txt', 'c83df7670fc2c80c.txt', 'd22120349e4b34d1.txt', 'd27b609beed832ea.txt', 'd2e5025a4e250
d49.txt', 'd2e75e5a9e8f5e64.txt', 'dc228ced6896078d.txt', 'e6be4b1bac13fd3b.txt', 'ebbb4c6127e02658.txt', 'ee34a826acbe75ce.tx
t', 'f03c4f142bbc224e.txt', 'f288c2385b3935c0.txt', 'f4c4c32773d9aeb6.txt']
```

Bull
['00e6ccb5516d6bdf.txt', '02b12fe295225ba1.txt', '055747f5734e6007.txt', '07f1fe9ce97c8fac.txt', '09309ea0a9a824d1.txt', '0a965cbeacb7d0a1.txt', '13508bed667a59ed.txt', '1830e7176fae4dac.txt', '1a7a5c2be98b984c.txt', '1dbd38b8d1e0c6ef.txt', '239561683e6e3824.txt', '26647e766e6e2cce.txt', '2746553a5434df65.txt', '2f6ff7daa1beb4c5.txt', '35a86249723da96b.txt', '37f7993e36d1e4e0.txt', '42e0f59b6160671f.txt', '45ec9b607d6f6cd7.txt', '4c6d716e2186a652.txt', '4f76023448035878.txt', '544e6900c23b5020.txt', '5b778f6fe26f7d7c.txt', '5f8aaec8ed14a3db.txt', '6089d295a6409364.txt', '650b5dda92c686dd.txt', '6e8cb3d2954f9586.txt', '746b6e513ba7c165.txt', '787d0f5334a13409.txt', '7901a0aa7e1a6a9e.txt', '7d328ab73edbb52c.txt', '83acc5c3ef30e901.txt', '86cbd972531d32c9.txt', '913f77b07603c598.txt', '9e82314dc99e8d18.txt', 'aa1506124d367de0.txt', 'ae8ddb9b82ba3280.txt', 'b068436674b2c755.txt', 'b95a12993e757e2f.txt', 'd871f38c800bd291.txt', 'd94fdf4650c23aff.txt', 'db3fb845d5b36447.txt', 'de40062ded8af6a1.txt', 'ec2b7719ad255c5a.txt', 'f0fa3e1e8977b606.txt', 'fa262ce5dc8cdc4e.txt', 'fdc63a76522fbc15.txt', 'ff663de6016706b9.txt']
Cheetah
['025d25975e4275a2.txt', '025ee4909cb7e97e.txt', '073811ad87a0c731.txt', '09b1e0cade519f22.txt', '09bd2505b02e1965.txt', '0c61b8d86a3e0889.txt', '0e0a2946dcb38b5a.txt', '0e8cae40d9ecc314.txt', '0f09e298d7ca270a.txt', '0f24834203820116.txt', '0ff0dc652d533877.txt', '10002ceda87bb08b.txt', '113fbf2203ccef57.txt', '1156515b1c0490fe.txt', '12f82917d830a426.txt', '13b142587e89049b.txt', '13ede5647e775953.txt', '1599c48eeeb65904.txt', '15b157fcf5d37105.txt', '168ce61fda9fca67.txt', '16c1cdce1c3f5b8e.txt', '16c513ba4f27ae10.txt', '1727fd355b8cef8d.txt', '185b2bcae2100951.txt', '19171da8690e4a2d.txt', '1996d28edc1900b3.txt', '1af84ed743fb84c8.txt', '1b6ab3cff653562d.txt', '1d6cd967919e36aa.txt', '1db0cfaa068127cf.txt', '1dbb2ef2eca3e8cb.txt', '1ed5a16de1865541.txt', '22c6ce1e55f0eb79.txt', '23906848789da991.txt', '23ab0e17849b7d7d.txt', '247e18d19e86be52.txt', '2546b57e18682a68.txt', '26b36696f1585cfb.txt', '27b0093ca752cb4f.txt', '27ea0de3a73e1598.txt', '2974f192a7f94688.txt', '29f4113cd18b49b2.txt', '2a2315f9d23f97c5.txt', '2a782f57d7ce6efc.txt', '2c1cbb8f2c865476.txt', '2c7fe6edd3fe4f35.txt', '2d3b81d6001c2bfd.txt', '2de570eeb2cdf36b.txt', '2ec1dfad9f6098a3.txt', '2fb193752edf45d4.txt', '3054d68c25d49d54.txt', '31ba617f121fba57.txt', '320ab39486917b11.txt', '334e9b6d91f6b739.txt', '340335ba3759909f.txt', '340a4cac16de6621.txt', '350dd2f070b6f1be.txt', '35480622ab5e9403.txt', '3583fa31dc2c2aa5.txt', '35f3735eb1d3126d.txt', '37f6763d2ffd85df.txt', '38c1d2600f9866ab.txt', '3d24f759035d8244.txt', '3debda828eb3cead.txt', '3def6a9a7846708b.txt', '3df29b974a3f12fa.txt', '3ef239f28d081d84.txt', '40f446161cec9d35.txt', '42346dd76ba1d1bc.txt', '44159a4b6bd9fb2c.txt', '447b7cf25577653c.txt', '4485c8a6009f67f0.txt', '44864f39e6c33b93.txt', '460f69bfeacdcd72.txt', '46a2080eee37447b.txt', '481116056d6fabe8.txt', '4ca2281f4ba41701.txt', '4d761adbd302cf5c.txt', '4e5711ae48fc9508.txt', '50690d29d4d3c0fa.txt', '524a61748187f69c.txt', '56d472b72f750335.txt', '59b51fe320539005.txt', '59b63a6cf1aca63d.txt', '601c4f42bfb9c50d.txt', '621554a236114e55.txt', '6582b89aa15e36f1.txt', '6d613ea1b58411f1.txt', '702e415b0ebea3e2.txt', '71063759c6247c81.txt', '728665ece1fd4d01.txt', '747fd65e44aa6699.txt', '77b39c20caa61c5a.txt', '79af4885670c9a67.txt', '7e44e17e9e9d3a44.txt', '7fab36c20841cfbf.txt', '86d4292bc171f835.txt', '8f34ab7a9b7a8f9b.txt', '906a6d5d1128be13.txt', '930776d994d92a33.txt', '9a4898004791b3c8.txt', '9ce1cce41985b219.txt', '9f01fa5125c7d438.txt', 'a33704d687da856f.txt', 'a8537e4f51d66e24.txt', 'a8b4069d7050935c.txt', 'ab00771218f8d0b4.txt', 'b3505d83a2993d2d.txt', 'b62a17684dae6a25.txt', 'b8b23161298c7166.txt', 'bb5cf06e0c97f373.txt', 'bb90a60f10aa66c8.txt', 'bce8878dfdedef09.txt', 'bfe7c1e338f6acb0.txt', 'ca2e9812a717b9b4.txt', 'ccd025f3c0bef0da.txt', 'cef3be621dab7306.txt', 'd290e0d60662e297.txt', 'd555c6e7b78f0129.txt', 'd6be17a9ed4f9aec.txt', 'd9da9bc2a3d4c64d.txt', 'db21d2f3774862b0.txt', 'dc4d55d2094ca0e7.txt', 'e45e8bcc137926d8.txt', 'e785f386fabbe438.txt', 'eac093db0bf03905.txt', 'ed4833a67b7cf93c.txt', 'f17c21d7591c770e.txt', 'f223bea6dedb3d16.txt', 'fc807dd27003f87e.txt', 'ffdc67c279ec0334.txt', 'fff9461861633cd1.txt']

Crocodile
['00980117bd3595ca.txt', '01cb17fd76b54df9.txt', '02821806e7bb9db1.txt', '03f8df875f27be8a.txt', '0453eead640962ae.txt', '0748377955b5316c.txt', '079c78950a657008.txt', '081ab02a944124f8.txt', '08d447dbb08f5ce8.txt', '0c05d442d679222f.txt', '0c957a36b006d373.txt', '0d36a4962702f795.txt', '0d9e02617d5939da.txt', '0eaba1786fb24fdf.txt', '0ed49697b9ad6796.txt', '0f3be371590e6697.txt', '12fc9cbc1ae80cdc.txt', '141d3b45da0c0b6a.txt', '1483fb69a488d4a7.txt', '1565397df2da0c4c.txt', '174ac159861ff5d5.txt', '17dfee10a628f5e5.txt', '18f2c9afca7c1db2.txt', '1968bb6ca928f841.txt', '1c237d305fe3ff1f.txt', '1ceb85bdd99fa986.txt', '1f22d82469efd731.txt', '21383690b9020539.txt', '214c12e887b09528.txt', '230ce79f25812cfd.txt', '23674643f905f784.txt', '257cdc93fc6b71b8.txt', '286f069b703d9664.txt', '2910afe42dca6270.txt', '291ef8c7818391d6.txt', '2a9caaed128ab4a4.txt', '2c6ffab4f46d08d5.txt', '2ce948ca7df8204f.txt', '2ce98eac3eec129f.txt', '2e6d7c96b4a4fbe7.txt', '2e9216633cfbff22.txt', '3147f693d5ce64da.txt', '33e74b6b88d14904.txt', '3544555a1bfabdcd.txt', '392cc01924954983.txt', '3b1bb08023f3e1e4.txt', '3b371e62155d8603.txt', '3b74396b392aba27.txt', '3c7d5db784f7fbe3.txt', '3c8531e9c5af3429.txt', '42364a322f40e1ed.txt', '42ec36f16f554e7f.txt', '44e75055fec7e013.txt', '4cfb4968b1b812ac.txt', '4d4694d2b3db73c4.txt', '54e3c9901f454337.txt', '55e971e0b743202b.txt', '584cfcc8ebb27024.txt', '5cdf7397017a1282.txt', '626530c92081bec9.txt', '62bc5ba75db29156.txt', '63f96371d4188ea5.txt', '6577eec10d3d1ca5.txt', '6e9fd7542f5ec168.txt', '6f37ab0cb59268df.txt', '71147d86817f8d22.txt', '72d0c2cc6abd5112.txt', '79b33ec016535445.txt', '7f34dff85889e71d.txt', '7fea51d12521ffdf.txt', '810a0d1f35f003ca.txt', '82d8c33d33136477.txt', '86cd316c9dffb134.txt', '8c1850fdc31f2aca.txt', '8e422b7ec97d7504.txt', '8f0830da68ae30b8.txt', '93eaf2187263a1ce.txt', '986173f415ea045b.txt', '999502ea2dc132e7.txt', '9d8594275c354894.txt', 'a0938ba03ba4abde.txt', 'a0a6c9976a84afe2.txt', 'a14938c4338bf24b.txt', 'a1b1f75d9facf299.txt', 'a42a6c22ffbc8331.txt', 'ac8f3d6fd64d616f.txt', 'b1305bbfbf2a7b39.txt', 'b56ac8499132a123.txt', 'b587fe09f6f8a84a.txt', 'b599c7dd128f8c50.txt', 'b993e00438d7e14c.txt', 'bfa4371bd90038cd.txt', 'c02e74b1fed6ddad.txt', 'c1cd66ab41931725.txt', 'd08e1ff4ef3252d0.txt', 'd0dff91f5ca0e4f3.txt', 'e02c030cc2baf3f0.txt', 'e4373bbe91dc78b8.txt', 'e519ed27c4dfe96f.txt', 'e921b0d45998f9a5.txt', 'e99d009dd43fd143.txt', 'ecbbbd4f42ca9e0a.txt', 'ef274dc898946734.txt', 'ef9a5122d2c4cb21.txt', 'f0eb2abb125c5886.txt', 'f43cf3537b5752d7.txt', 'fefea6741541ce1e.txt', 'ff51ca5a78dd04f7.txt']

Jaguar
['00d9eb862ba3dfc6.txt', '00faed7a340a1101.txt', '0107395b9550040b.txt', '02213bb42b24841a.txt', '025d25975e4275a2.txt', '025ee4909cb7e97e.txt', '03de3c7807d59601.txt', '0451a64b6d93c015.txt', '05101fc57a1cddb9.txt', '05369add5239d3db.txt', '06d29b1f55dffe75.txt', '088d2b1af532f609.txt', '0ad924a66f5ea8b4.txt', '0c04000699dd0436.txt', '0d8bdffd0fa41b84.txt', '0ff0dc652d533877.txt', '1111983278b100e8.txt', '1156515b1c0490fe.txt', '12271a9ed07dc28e.txt', '137e80a3d6afce59.txt', '13f5e8d42c3995c1.txt', '1512b780c970baa7.txt', '166d6bfacff86039.txt', '17ae168666e01588.txt', '1880576823018b60.txt', '19ad96995792d1f4.txt', '1b0ce31951048765.txt', '1b94c30d1407cc6c.txt', '1bea54a4c02d2829.txt', '1d6cd967919e36aa.txt', '2229c90e6028e2e9.txt', '2256b389cf644faf.txt', '25c9037366f5d1fa.txt', '265896f3a94bd420.txt', '2842be8d4362a102.txt', '28cd82b6ffaf4f82.txt', '292b2e92713b2b0e.txt', '298e72b6fc9e7cd8.txt', '29bc7b1fdb3c048d.txt', '2a2315f9d23f97c5.txt', '2a8f717f2f54182e.txt', '2d26feceab162643.txt', '2d9c29952b9e802b.txt', '2f7ad680ffebc691.txt', '2fd43212cbd1eed9.txt', '311ac95022868cce.txt', '3369155dac8f0dff.txt', '33c9857d5feba986.txt', '340335ba3759909f.txt', '3462ae5639cf64b0.txt', '387334f251867b5f.txt', '3c77c451d3580d53.txt', '3cdad21202142dde.txt', '3debda828eb3cead.txt', '4485c8a6009f67f0.txt', '455c78a26fc7ebf7.txt', '481c1a8cb4b466df.txt', '4b13bd8892c5e377.txt', '56d472b72f750335.txt', '5bb7d055e317cffd.txt', '621554a236114e55.txt', '6277d19ee874517e.txt', '6752ad0ae33685f9.txt', '6d613ea1b58411f1.txt', '6fc49bbc6acde1e9.txt', '71063759c6247c81.txt', '71d9849a0117ebc7.txt', '76dc66d32fe2f3d5.txt', '77b39c20caa61c5a.txt', '7b655b3121c633b4.txt', '82ce54b03fb131d8.txt', '839eeda355804ea0.txt', '8525f4bace7c6046.txt', '86d4292bc171f835.txt', '875c88039ba6bcca.txt', '8e6a3e3111dde317.txt', '906a6d5d1128be13.txt', '90c41ae2bb708b2b.txt', '9219f6177b44388f.txt', '9ce1cce41985b219.txt', '9f01fa5125c7d438.txt', 'a33704d687da856f.txt', 'a8537e4f51d66e24.txt', 'ab00771218f8d0b4.txt', 'bb5cf06e0c97f373.txt', 'bb90a60f10aa66c8.txt', 'bea43537fab96e66.txt', 'c01556a0d0cd6f30.txt', 'ca2e9812a717b9b4.txt', 'ce863a4091dd5aed.txt', 'd290e0d60662e297.txt', 'd555c6e7b78f0129.txt', 'd7a37993c69a9c06.txt', 'd879bc987a5647b0.txt', 'db21d2f3774862b0.txt', 'dc4d55d2094ca0e7.txt', 'e45e8bcc137926d8.txt', 'ef7b8b92b0c801af.txt', 'f17c21d7591c770e.txt', 'f3475d169367ccbe.txt']

Elephant
['000f0d2fe4e5fde4.txt', '003a5d2cbb797b7c.txt', '0075679b808245e7.txt', '00f781ce48de2bda.txt', '011162989a767653.txt', '0121f2156bef75d7.txt', '016ef3c82183e420.txt', '01befe6ba0fded96.txt', '01fb343ba58cdc3e.txt', '024760bfa3f4aec2.txt', '02755b91beeba404.txt', '02b7c5b5c2ee853c.txt', '02d1be93414c4201.txt', '02fe950c629603b9.txt', '034904a1ece121ce.txt', '042ec2fb6dc546a5.txt', '043e8e352abc2ccc.txt', '04972a6babe6f5d8.txt', '04b59c4174194c56.txt', '053da482bc4d5f8c.txt', '057b22b77d455784.txt', '05aa6bf6a760642e.txt', '05ca9ad0b8d8a818.txt', '05fe0257c734a078.txt', '062db5cb91f92dfc.txt', '066ed679c721bf70.txt', '067e02db5be443df.txt', '0710d550250a183d.txt', '0813558e1e729e57.txt', '084599bb84e38f34.txt', '088f5f45f9efd921.txt', '08a17f4678786480.txt', '08cb32ae551d091d.txt', '091f8cbe32ba5523.txt', '09c002eecb00d13a.txt', '0a61c79bae099e59.txt', '0a79782f1fee353e.txt', '0a7eebb5e22fa236.txt', '0a8bb3387dc08b31.txt', '0b0a7f131561b5be.txt', '0b4d3e75eeecd058.txt', '0bdc8bc48fd3a704.txt', '0d1db5a77fb71f61.txt', '0d50a67294957d12.txt', '0d898a022fa250fa.txt', '0d9da5a2b3ef8ee6.txt', '0ebbea68d6fb2768.txt', '0fdd15f168b49b61.txt', '0fef4545be15c3bd.txt', '10fabc7e1b944ca3.txt', '1210d1a6936232bf.txt', '12938431eb3d7465.txt', '12a6c8434e5787ec.txt', '133a71787013c179.txt', '1482734c63268d33.txt', '1530e6d960e8d3b0.txt', '15dade0f1dbc2959.txt', '1971fb6a7175d8d8.txt', '1d1b15275897d8d8.txt', '1d5f17a96ea94bec.txt', '1d764afdadfa72ed.txt', '1ec4dfe656d1b0c1.txt', '1f3f5c338870c8c9.txt', '1f9b913e9ccb27b3.txt', '23956cdcc77d1125.txt', '249b95f74102e671.txt', '262beb22ec7aaac4.txt', '2847f954b41cc44e.txt', '2c7e4129e5426eba.txt', '2d1de44ab30e4bc9.txt', '3226a299bf13bc6a.txt', '35154dba28c75a75.txt', '37547ab19a05f4dc.txt', '37e0065bdcc7d4a6.txt', '37f79288d928c45d.txt', '390e17091e407528.txt', '3f660957d4e3b81d.txt', '41c9b734be3e1acd.txt', '4333157b6287b8a0.txt', '43ceed9909ae8a57.txt', '44a7948bb458506d.txt', '48bdf753bad43c1c.txt', '4ad598307495eafa.txt', '4aee22b6e7b65d8d.txt', '4cc61fddd2669a38.txt', '4e7969e707ad5913.txt', '519d848081eb06a1.txt', '5787a8cebe4b21ca.txt', '59e113e00a72d95e.txt', '5d60d1bf6aefd0fc.txt', '5dbb6c91f5d63135.txt', '5eb8360be45016eb.txt', '60886294eb29a292.txt', '6e5f52f9fd15544e.txt', '6f3fc91a96e478fc.txt', '6f7bcb740cd712af.txt', '6fc6d2fb5a34af59.txt', '727aed2006f35aad.txt', '757dae135795d48a.txt', '7a4143689fd6b616.txt', '7b3876c9e98f8a33.txt', '887af2226cb620e9.txt', '8884144c9fe8a769.txt', '8919536b577eb796.txt', '8d6ea49271d24e00.txt', '8ee628fdb30f4736.txt', '8f9819eb9156cba5.txt', '90967da1f70cecda.txt', '9a461d5ddde63379.txt', '9b420a02cdb73cd9.txt', 'a4c5ba66554403cf.txt', 'a504df0adb0ab26c.txt', 'a57278e8314027c8.txt', 'a61673c2add4a4b2.txt', 'abd9a5b02c93eb1a.txt', 'afd0bc5a0fb45bf3.txt', 'b14076ac4f819bc2.txt', 'b1adffb16c9e6245.txt', 'b41f2ff0a00d4ef1.txt', 'b5d1b4f67a30fea0.txt', 'bb8ff525a9568646.txt', 'beb59552074f70fc.txt', 'c01abced24481542.txt', 'c0d7fa06744a9931.txt', 'c36aa10aa1db9be0.txt', 'c437b6fa4e9c1496.txt', 'c58453df8f65b2f7.txt', 'c6862870c536901f.txt', 'c815217fc535053b.txt', 'c8821820a96c8cd7.txt', 'ccaa29e7bf503fa3.txt', 'ced5f89d947de281.txt', 'd02df08b27cf65cd.txt', 'd0516e042097fef0.txt', 'd340bd83c78d1db7.txt', 'd40287bc18de5cde.txt', 'd593b3a9e8221777.txt', 'da10229eadd71ce6.txt', 'db08d7e66b723bc0.txt', 'dd9bd825a52d6bea.txt', 'df16f10ddca78407.txt', 'e102b58e87d8c6f8.txt', 'e313f933b1e8f321.txt', 'e662b4a41a34ce0e.txt', 'eca046ef3e261447.txt', 'ed93b652df48332a.txt', 'ef9e9403c69a9f65.txt', 'efc3772a924ec7c2.txt', 'f535565c9241bebe.txt', 'f843f05fd3ca8eea.txt', 'faf8b29a11dc5268.txt', 'fbe3c2a4477edb8f.txt', 'fca391368bb19f6b.txt', 'fe781f361a6621fa.txt', 'fe94d0b375b5a558.txt']

Leopard
['00faed7a340a1101.txt', '0107395b9550040b.txt', '01efa3d259d95396.txt', '02213bb42b24841a.txt', '025d25975e4275a2.txt', '025ee4909cb7e97e.txt', '02f3eff22241f28d.txt', '0371627add32994f.txt', '03de3c7807d59601.txt', '05101fc57a1cddb9.txt', '05369add5239d3db.txt', '06d29b1f55dffe75.txt', '07642e275bb2b869.txt', '088d2b1af532f609.txt', '0c91224924f49890.txt', '0c9b1234e6efeaed.txt', '0d8bdffd0fa41b84.txt', '0e37579ded599075.txt', '0e8cae40d9ecc314.txt', '100984ad300bc000.txt', '10c2d9eed23378c5.txt', '1111983278b100e8.txt', '113fbf2203ccef57.txt', '1156515b1c0490fe.txt', '137e80a3d6afce59.txt', '13f5e8d42c3995c1.txt', '1512b780c970baa7.txt', '15b157fcf5d37105.txt', '16619f94dec8010c.txt', '166d6bfacff86039.txt', '17ae168666e01588.txt', '1848d8b3366aafe8.txt', '1b94c30d1407cc6c.txt', '1e76a6bc203153ba.txt', '23edc1fa74c892b7.txt', '24577575fe3a68d2.txt', '2478080c7c749c9b.txt', '2546b57e18682a68.txt', '25c9037366f5d1fa.txt', '26567c3c02e3feff.txt', '265896f3a94bd420.txt', '26e13ce3a97ee449.txt', '28ec6cefeefad269.txt', '2904389a67411e1c.txt', '296f53daf6526815.txt', '298e72b6fc9e7cd8.txt', '29bc7b1fdb3c048d.txt', '2a2315f9d23f97c5.txt', '2c2f98616415b3e0.txt', '2d26feceab162643.txt', '2f04cd2d0ba3331c.txt', '2f7ad680ffebc691.txt', '3054d68c25d49d54.txt', '311ac95022868cce.txt', '32d174e016d8c38b.txt', '340335ba3759909f.txt', '3462ae5639cf64b0.txt', '3583fa31dc2c2aa5.txt', '3cdad21202142dde.txt', '3debda828eb3cead.txt', '42346dd76ba1d1bc.txt', '4237db4b8998195e.txt', '4485c8a6009f67f0.txt', '455c78a26fc7ebf7.txt', '4bab8b398dd5005b.txt', '4c4fe5b0e6fcfc79.txt', '4ca2281f4ba41701.txt', '4d761adbd302cf5c.txt', '50690d29d4d3c0fa.txt', '5200e411a72d11b4.txt', '524a61748187f69c.txt', '56d472b72f750335.txt', '59b63a6cf1aca63d.txt', '5a7792b552448774.txt', '5afdf571d2c32e9a.txt', '5f0f107f01f6a656.txt', '621554a236114e55.txt', '62fb73bc19d54285.txt', '6d613ea1b58411f1.txt', '702e415b0ebea3e2.txt', '71063759c6247c81.txt', '71d9849a0117ebc7.txt', '76dc66d32fe2f3d5.txt', '77b39c20caa61c5a.txt', '7be555acd7fc9cce.txt', '839eeda355804ea0.txt', '86d4292bc171f835.txt', '87cf0c8d25441f2d.txt', '8c236a93ecc7b7bc.txt', '8c865b6117fca262.txt', '8ceaf15db3d6bf34.txt', '906a6d5d1128be13.txt', '91bc93f59d417392.txt', '930776d994d92a33.txt', '9a4898004791b3c8.txt', '9ce1cce41985b219.txt', '9e3c759ccfcc43d5.txt', '9f01fa5125c7d438.txt', 'a33704d687da856f.txt', 'a8537e4f51d66e24.txt', 'a8b4069d7050935c.txt', 'b3505d83a2993d2d.txt', 'bb5cf06e0c97f373.txt', 'bb90a60f10aa66c8.txt', 'c7f7d02a28d3969f.txt', 'c9f055f4eda92d9b.txt', 'ca2e9812a717b9b4.txt', 'ccd025f3c0bef0da.txt', 'cef3be621dab7306.txt', 'd2906b26acd16403.txt', 'd290e0d60662e297.txt', 'd555c6e7b78f0129.txt', 'd6be17a9ed4f9aec.txt', 'db21d2f3774862b0.txt', 'dc4d55d2094ca0e7.txt', 'e45e8bcc137926d8.txt', 'eac093db0bf03905.txt', 'ed4833a67b7cf93c.txt', 'f17c21d7591c770e.txt', 'f3475d169367ccbe.txt', 'f4d0a87ee9a33a70.txt', 'fc807dd27003f87e.txt', 'fff9461861633cd1.txt']

Lion
['003f0ccb3f0b3d62.txt', '00a1538999a95b9c.txt', '0128e812329ef3c4.txt', '0157735f84d4d99e.txt', '01b930ce596d2d26.txt', '01ddddc577890595e.txt', '026259ac70a1702d.txt', '026f6d3fc145e32c.txt', '029ffe8ecba41fb7.txt', '02a8e1aca466e37a.txt', '02e64b6705221e1b.txt', '035fa76128ceb891.txt', '03a0ceb0342e6ef9.txt', '0418adfd3302ea9b.txt', '04216cd29e3d237b.txt', '042e46ae1c186e8a.txt', '04c53baf87261b78.txt', '0526d550b528fab3.txt', '053571f01a938ed8.txt', '05359f92559e737b.txt', '055dbbcca8626dbb.txt', '064239485278de34.txt', '068176c4e97d104e.txt', '074ca8a9fb5073b1.txt', '079b73569c008296.txt', '07c3f5589a2cc1cb.txt', '07c8fb7eaa941e5e.txt', '082dc957e408ba17.txt', '0863c6bfef85e9fe.txt', '09067b8a7f051b6c.txt', '0920d7dbdc425032.txt', '09234765a02cf4c4.txt', '09708a3c4d623287.txt', '098c23f32454963c.txt', '098cb06f0f93fb88.txt', '099db382ee656b0b.txt', '09b0e805c5c0e0fe.txt', '09b1a1ce05216138.txt', '09d00a0cef553be2.txt', '09d7d59a9e0698d3.txt', '0a9c5544f0457035.txt', '0afa7272984b9360.txt', '0b15b97523854fb3.txt', '0b42c367365139bb.txt', '0be063b8640fa283.txt', '0c0243319275866b8.txt', '0c4da71df4265f84.txt', '0c74b1b659bbea89.txt', '0ce4501e079b24a4.txt', '0d52ad71c5f0ffaf.txt', '0d591d95858ab0d2.txt', '0db4a8ed83630516.txt', '0e51e1ff2ade5cef.txt', '0e84faa486313dbd.txt', '0e977e8ab5d64dfb.txt', '0eaf3634d66224b6.txt', '124f18f16a8902af.txt', '126bcf98d1afa9bd.txt', '12b5606107c34487.txt', '155d39f66c0ec625.txt', '18322c4182d99007.txt', '1b755120ca2f6cba.txt', '1be4a5ec407fc045.txt', '1e3814bddd5b608b.txt', '1f8d770f32fe53c4.txt', '1fd25da4b02238b5.txt', '20164b17379fe7ee.txt', '20738bb8a148b057.txt', '21447b07f7ca3fe7.txt', '2147f3806e733bd0.txt', '21c79fbb40a92ee6.txt', '25300e394f9aeea3.txt', '25ffea09a9cedae4.txt', '26216d42d11efe2f.txt', '26510203406ffbce.txt', '26d8d961177e64e3.txt', '2766c231ef864dfd.txt', '295fa8cbdc30ba10.txt', '2a7925254920c310.txt', '2aa5485b5d4b7246.txt', '2af605cc696a8f6c.txt', '2ba28139e3d4fffa.txt', '2cee62d0fea905a1.txt', '2dee44fd0d6b1d73.txt', '30205d32a2cd4a84.txt', '33771fd78487ecda.txt', '347af01f8aa006db.txt', '3492d46e38fced2a.txt', '38367cd6c0c25d96.txt', '39c2e8ff892ca637.txt', '3a831a9f7c0e5b36.txt', '3b07cda8cd836f5b.txt', '428f25c369928b45.txt', '42a18653551c6e99.txt', '45bf7a113287685b.txt', '4913adb6b6702acf.txt', '4ae92c638a9d43cd.txt', '4e7c0a3195e84876.txt', '4f2d6d4e31fc9882.txt', '522c3a491e68d3cd.txt', '527335f58c844fd3.txt', '55541fe803db7ab3.txt', '563cc1ff9fa87527.txt', '5a926b59b9d0a004.txt', '5d64b7049f061098.txt', '5dd04b310b66a573.txt', '623044d664835e5e.txt', '65d5ccc5497d84dc.txt', '6970ecd80b471527.txt', '6a394f99c5373382.txt', '6ad2530bc3af701a.txt', '6b508006e0328d01.txt', '6e3020cda7151b28.txt', '70c3207a88f2674e.txt', '71a68976ca7e3433.txt', '71c089897dd1d228.txt', '71cca3441f253ee6.txt', '75d89f93d826bd3d.txt', '78b5c9395085c8b7.txt', '796faf52ae180751.txt', '7b142d609115f196.txt', '7e10c855e8d4ca29.txt', '7f3690fab214041f.txt', '800226a3e0572c7b.txt', '810d708dfad94600.txt', '82e594c43d28d7b4.txt', '8485d6b6eba84a9c.txt', '854f4419a52611f0.txt', '8564e2649c55b440.txt', '885c69bf834c0290.txt', '8945595e8024ad0c.txt', '8a8552bf352aee91.txt', '8ad59f2c652c6b38.txt', '8b397691cf410b7f.txt', '8c6732c7f442a546.txt', '8d59972da962568c.txt', '8ee06a8365716a74.txt', '902e0b14ba5188b2.txt', '9444fb32f8871ce7.txt', '94c8e39f59cf35c2.txt', '96cbe99c0f39c169.txt', '99ffb2c7946b3

365716a74.txt', '902e0b14ba5188b2.txt', '9444fb32f8871ce7.txt', '94c8e39f59cf35c2.txt', '96cbe99c0f39c169.txt', '99ffb2c7946b3
451.txt', '9a9ca8e8056b57d8.txt', '9acf8612cc316ff0.txt', '9b91ad0cc4a42193.txt', '9c6cfd97da85dac5.txt', '9d7a94f426c575d3.tx
t', '9e31076aebdbb41a.txt', '9ebcecc7e71d894f.txt', '9fed4d3692211cd0.txt', 'a0aad606deaf3287.txt', 'a5fade4847f797e4.txt', 'a
7c5d9649a48cd94.txt', 'a8bb4c3f04d2ab6c.txt', 'aa9509bf594383aa.txt', 'adaa5c69e722ba93.txt', 'aedcb7ef574e86e2.txt', 'af61da0
26aaf1098.txt', 'afa74569c531e51b.txt', 'b01bcbbe99f06226.txt', 'b0b13bfefd0dfece.txt', 'b231997d3dd023ab.txt', 'b513d4c5f0962
cfd.txt', 'b709b1910c8f6add.txt', 'b7f8736256b10a02.txt', 'b984f42c96fe547a.txt', 'bb5987b5c7e16f33.txt', 'be44e8f9640eb11d.tx
t', 'c095280912201de6.txt', 'c15c37719ad24fe6.txt', 'c23e59ab608e0b02.txt', 'c2fcff4080b046dc.txt', 'c3e12fd239f1dd27.txt', 'c
44260d7bafc2611.txt', 'cb19f0a1e56318ef.txt', 'd0f5a856bf7a0f89.txt', 'd35eb436350a6c04.txt', 'd3c9fe77be89db14.txt', 'd55ec65
2e4f7925f.txt', 'd605da7159eed840.txt', 'd686a08f0473b54b.txt', 'd6cfb19aa348001d.txt', 'd73b58b8407a31ca.txt', 'd93c44ab770c8
a8e.txt', 'da92557dfa854a1d.txt', 'db019e320fea2ba6.txt', 'dbbb5e7403b108aa.txt', 'dd50e839ad6d2d64.txt', 'dd8daeae6a020016.tx
t', 'ddbf88190c2cbb61.txt', 'dec4b0cbe0a75702.txt', 'dfe97db153d065b0.txt', 'e52b50353fd22aa5.txt', 'e850548308a8fd87.txt', 'e
98fb2c868c8230e.txt', 'eb4efa667d9e90a2.txt', 'ebb7d0a95dbbfb00.txt', 'f0e6c6a1d092d0bb.txt', 'f18af006a18395de.txt', 'f233e1c
3df985bd1.txt', 'f25f55d9bd349346.txt', 'f2737bc835e4ae1e.txt', 'f363ae57a09abc0f.txt', 'f8510f8a5075d5d6.txt', 'f8958a678cb30
004.txt', 'f9c2432b6b85b84c.txt', 'fc7dbfdc577eaf2b.txt', 'fdd9b8c93053e3e3.txt']

Rhinoceros
['00a91238f4559e64.txt', '00ce44590d02a7d4.txt', '0109a40779eeda31.txt', '01742ec399d1cca0.txt', '0286b21fe4140ed8.txt', '028e
a807844709b2.txt', '02bbfa0c4140075b.txt', '0300b2d3bd9a7b92.txt', '03256484204ab58f.txt', '033768fb47bd89fb.txt', '035ea20cca
152c38.txt', '0411692d90465e2e.txt', '0480a1fd30169f12.txt', '04ff53db697485e6.txt', '050abc96719c48c4.txt', '0535586c8e65ef1
e.txt', '055f06a0e14c123d.txt', '05cca534d6ec740e.txt', '05e6301eaced8bfd.txt', '06f7fbf54b506adf.txt', '0730a03391894ca7.tx
t', '07cb3d9522a41e3e.txt', '07db8659ca2c22e0.txt', '0811c6713813cfff.txt', '088a72d6f81f4fe1.txt', '0921d9f73ab3104e.txt', '0
988a87d31701f1c.txt', '0a5830b82c0020fe.txt', '0a9bc1237531516c.txt', '0ab3a094b97654ec.txt', '0abb06db298db783.txt', '0c32669
76c2d833e.txt', '0c722452ed13a8ce.txt', '0cf12b04655cf81e.txt', '0d166a857d471fed.txt', '0d8964aeda393248.txt', '0db5d9cc2d03d
7e5.txt', '0e2287c03a0cffc1.txt', '0f40899f1d9a08d4.txt', '0ff30c5a510e6d83.txt', '108ebf7909c7cebb.txt', '111a66a681f4fd5e.tx
t', '1241b640ee2be27f.txt', '128fe1c4e0f02ae4.txt', '1298aa130c1ad102.txt', '12dfbf9a83da7098.txt', '13741295c5d06443.txt', '1
4393c6ac331f4ab.txt', '161cc189420a5a4b.txt', '16c17d8bd680c5b8.txt', '16fe731f5f62c8a4.txt', '1753d30425383fde.txt', '1759e23
e32a8cfbc.txt', '17693a7bc6931099.txt', '17b8973aa1a312fa.txt', '17ff3504d6aba3b7.txt', '18abbed2514d412d.txt', '18c63a10b0e2c
781.txt', '19869dce573a4c54.txt', '1a8e675c24eb144f.txt', '1a97a7cdf1791117.txt', '1ac018bc30027fc7.txt', '1acd0dc5a5b97236.tx
t', '1ae3d07f0319ac86.txt', '1c1ae1931086d02e.txt', '1c7b16ba642945c9.txt', '1d2523d199a9a5df.txt', '1d336b76d686c1f1.txt', '1
d6e9ab485242eef.txt', '1e2e51ad384d5f8b.txt', '1e2fb200be679b8b.txt', '1f1058b8f5ad7798.txt', '1f7bbe41e7511450.txt', '2100161
7f55cbc9c.txt', '210964c000c3d7f6.txt', '21bcf78c375e2646.txt', '227b0ca7a31d7c84.txt', '22cfad3f1335c86e.txt', '232bfd7e1e5d8
03d.txt', '237137a18ef273d2.txt', '2436c4fe5ea2bf3a.txt', '24395a0351590a84.txt', '2458de74f4c096e2.txt', '253b4cd4d289a580.tx
t', '25d7d01bdefaf726.txt', '25f0c02558405c4a.txt', '26c94d1374fc1440.txt', '26f65b8558686e7f.txt', '26fcbfb2db3bade5.txt', '2
70268ad60910e01.txt', '278b582d051e18a2.txt', '2794c141f5c0d771.txt', '27968043f4d6c896.txt', '28dfb3a5ea8b2976.txt', '2939bca
fbb54ef09.txt', '297ba80c29308c4a.txt', '29dee146a947e0c2.txt', '2ae08b64ca3148d3.txt', '2bbed4feec46f18f.txt', '2bf327b192193
cac.txt', '2c0f90cdf1dafac0.txt', '2c9c2d30bc711f61.txt', '2cbf2575a43614a7.txt', '2e55566f099a7e72.txt', '2ee908ed0dee752a.tx
t', '311fb60480673a19.txt', '31dfbcccec59eb6d.txt', '33171d95564d6bd7.txt', '3339e431e8e163cd.txt', '34c2d256a419d445.txt', '3
5463e9c665d687e.txt', '35af2b5c76bb34a1.txt', '35b34fed5a7cb9bd.txt', '35dbab39584a21db.txt', '36541f132ec44251.txt', '3872970
99bc85c60.txt', '38de77cb21d8c46f.txt', '39007b512f5bcff1.txt', '39ae8bcb9df3ae79.txt', '39cc04f7202712f0.txt', '3ab44cbfbe042
0fe.txt', '3ddbc3641e0d2877.txt', '3e481c3a43ef73d0.txt', '3ee85f7b8483aff2.txt', '3ef2370200b90492.txt', '3fb8f52163f3e319.tx
t', '4041e08d35ed718e.txt', '40558649accf38c4.txt', '4088de42f7cfb493.txt', '40db9773cdeba36c.txt', '4217229d8553d7ac.txt', '4
2752a3aa373e2f9.txt', '431974aac2e3db9a.txt', '454e00c6c69ce282.txt', '46c0b77225934f29.txt', '477e43d6cfc30aed.txt', '4a73245
feb6df664.txt', '4d8d53f85d3c0944.txt', '4ddedf8997fc1da4.txt', '520e37484fc5e7ea.txt', '5240682478688801f.txt', '52b4b9bf7895c
ded.txt', '52d7de8ffad7ff62.txt', '533de14f42b32cfb.txt', '536f0851c79b7e2d.txt', '537aca7267d56292.txt', '550a9252cfdc66d2.tx
t', '58467596a3811dcf.txt', '5887bb5dee14b38b.txt', '598de5508b12a015.txt', '5aeb793572b869d8.txt', '5f1f4fca701c281e.txt', '5
fd17e51b2a79e5e.txt', '5ff72133feb64700.txt', '6085f6f4648cb06e.txt', '60f5ccfa5e1c7791.txt', '63cceeb6c504d42b.txt', '64886a1
e3ff2e3a6.txt', '65721e7295a670ec.txt', '665a413c2e4c723e.txt', '6736157a0537b2e9.txt', '683f62f92398ae57.txt', '6b794ad094b53
807.txt', '6de5de59ad2821d5.txt', '7086dd217cd271ac.txt', '7117500d94d174aa.txt', '750460208d955526.txt', '7a94123c80b3dd07.tx
t', '7d8f0dc2026d605e.txt', '7ef6ae3626709264.txt', '81263c8cf5acee76.txt', '835554b5c213dced.txt', '84025cbaddf14706.txt', '8
4ec5b2cda934ee8.txt', '89c73bb7a31bbdd8.txt', '89d7ca679dd602e6.txt', '8a7e1606c12b3e09.txt', '8abb894c35033bda.txt', '8f20360
440f8f225.txt', '92a6049570811405.txt', '934e7860c5dfc5e9.txt', '940ddd601f9a02a1.txt', '95ac1e379b9fd752.txt', '973e442667901
ded.txt', '98256f54ddf73a6c.txt', '9a0103b4a6fc02d7.txt', '9ab72b929238ed0e.txt', '9cf9ff193fdeee6d.txt', '9e381c5e142dc5bb.tx
t', '9e6f6e15feffc628.txt', '9e89ab0c61c81ffd.txt', '9f8941d352bbfa4d.txt', 'a234de81577bf144.txt', 'a27270c5e60f26c7.txt', 'a
2f1b5e33e79e21e.txt', 'a971b31b4cb7415d.txt', 'b1b76cb313f71ccc.txt', 'b9eed64e3fb5576b.txt', 'bccacc8b7b01c506.txt', 'be8426c
315cb62c9.txt', 'c37ebc0078f6dd03.txt', 'c41cfe00542c93c1.txt', 'c7103be765f3ccfa.txt', 'ca5f4a52ac793b2b.txt', 'ccd7b7ff673d2
89d.txt', 'cdf81f0215ae1915.txt', 'cdffa353cdf6a988.txt', 'e4c40f18d33d5f5e.txt', 'e68b9ffde464bedd.txt', 'e7d8f01c2708f429.tx
t', 'e92bd0a404c6f4b9.txt', 'ec02ec5e4f9e03a0.txt', 'f21040e6071f95e4.txt', 'f6f9dfd5bbb1f984.txt']

Tiger
['003f38058fbe4fb3.txt', '004793df03b93a02.txt', '0054a20adb57f3af.txt', '0083350d5dfe93a8.txt', '00a2865d18c02084.txt', '00db
e48c211c9e71.txt', '00f2603a5b42fb06.txt', '010739d688d6ff46.txt', '0147501b375efff1.txt', '017f21ae406acbdb.txt', '017fc1a69e
4c3017.txt', '01cf0d5b15633f1b.txt', '01e4531b935c11de.txt', '01e4eb8072609eef.txt', '02577a2e2e0ca961.txt', '02871f24d5abe59
c.txt', '02d83ecbab46f3bd.txt', '032a5c4e501b8e6e.txt', '038baaefc97e2d47.txt', '0391f0d38f8a7daf.txt', '039d20705ddc6162.tx
t', '041b524627acae82.txt', '042b8b7519aa8c39.txt', '0431f38fcef25d9b.txt', '046838e218d8d6d8.txt', '0498b54f116ee836.txt', '0
4b1d9adf8dae7ab.txt', '04b796fea4ebe839.txt', '053bcf755ad1e804.txt', '056746db2e23f6e8.txt', '056aa8c06fe2859c.txt', '059c518
2558e9475.txt', '05c913c19e8037a4.txt', '05c959de017c879e.txt', '05d0c377a5948e85.txt', '065bb69afbb80f69.txt', '06b3f5635030b
74e.txt', '06e6eea219b148f7.txt', '06f865e69faed09e.txt', '07313d3798ad696a.txt', '07995b924f1cc6f3.txt', '07e6a55a2f832fa1.tx
t', '07ea56e86aa8d730.txt', '080cae20f6a5f235.txt', '084df91c02df17e6.txt', '084f03555693c3db.txt', '08503681fbebd344.txt', '0
905996e366f2eb6.txt', '090afab3512488cd.txt', '094772c9eae367e2.txt', '09531f012d1e51e2.txt', '09f06a74bbb66179.txt', '09f67df
3ef2013d0.txt', '0a1e091635343c6d.txt', '0a9142a15c14e2d0.txt', '0ab95048a8eb5537.txt', '0acc21bf636785e8.txt', '0b0dec0961469
99f.txt', '0b11c3efc43e5094.txt', '0b4d9b81cce28074.txt', '0b9e607e15cc318e.txt', '0bb001b19c36877d.txt', '0bc64439b1ad5f1b.tx
t', '0be8f77f1614556e.txt', '0bedb17a20c209d2.txt', '0c0b954ef5d0ed35.txt', '0c2066aa20314f38.txt', '0c34c297a5b702da.txt', '0
c6d7c06939c4812.txt', '0d0562afcbf80ef9.txt', '0d24be3a3f45fd03.txt', '0d3990fc54fbdf1d.txt', '0d48de8d562b862f.txt', '0d4b6c5
145e55be5.txt', '0d4c46fde4ed888d.txt', '0da9d0f183c59285.txt', '0e017e56311ffed9.txt', '0e0a747f5eeb5ed3.txt', '0e1659641d452
60d.txt', '0e209fc7cfffe5f2.txt', '0e441053803b7dc5.txt', '0e5426035c36bb4f.txt', '0e5be04e10615696.txt', '0ee5f21fc3e33d9b.tx
t', '0f2ee63575b19738.txt', '0f5e8aee41b61e35.txt', '0fe861cd8cf010e7.txt', '1025e4a549d722cf.txt', '102d19a954869ec9.txt', '1
063a7ce2fd826ab.txt', '1094d2697374fa3e.txt', '1122cc4d35422190.txt', '117e594cd59a6961.txt', '118b8cc19de8ce25.txt', '11b164c
3b7a893c7.txt', '12191117070ef903.txt', '1232fb90fc2b0b94.txt', '12a94e9f8a7a973a.txt', '12f89865d8c16fc6.txt', '139412dbcf228
5be.txt', '13d0dcc558135c35.txt', '13ef96627657f58f.txt', '146f4b518c84c0e0.txt', '14a1d84351006633.txt', '14d4e3b07e9b1cca.tx
t', '1517df0149269fe6.txt', '154b395203a555ec.txt', '154bd66063cc6807.txt', '157ef452fe99937f.txt', '157f13d25428d609.txt', '1
5c420badd93696e.txt', '15e474783592bb57.txt', '1651f3135f0ff9da.txt', '167de3638c5d1bfb.txt', '169cd3d35488b8b7.txt', '16ba72a
ef7e5871f.txt', '179e971a7534f7cb.txt', '17c1fa1973d9a40a.txt', '18400e6192e37862.txt', '19241297c10762d4.txt', '19359f310a06c
483.txt', '193d7fdc246af034.txt', '19a86495b30c8fa8.txt', '19b61029c1a729ba.txt', '1a46299c43be9a1d.txt', '1a4e8ed2f16544e0.tx
t', '1a4f3074a68ce9b9.txt', '1ac8731ea6c8e30c.txt', '1ae5ecdd8ed4e7e2.txt', '1bb16a3e369b2752.txt', '1c48acd28b3f6d71.txt', '1
c92f5c6b9330b54.txt', '1cb4cbbac8aed22c.txt', '1d9330e4fecefa14.txt', '1e13ddd6c977fff8.txt', '1ee5306e4b2ccc4c.txt', '1faa8fe
761f7eaee.txt', '2066b65c09a783c8.txt', '21a191643c1a81b8.txt', '21a9a556841f7966.txt', '2478080c7c749c9b.txt', '24c897202aa64
73b.txt', '24cc82665712bb80.txt', '24f1494420978e2f.txt', '2545e668e0aec646.txt', '264b2907355a6120.txt', '26c1751789680627.tx

```
761f7eaee.txt', '2066b65c09a783c8.txt', '21a191643c1a81b8.txt', '21a9a556841f7966.txt', '2478080c7c749c9b.txt', '24c897202aa64
73b.txt', '24cc82665712bb80.txt', '24f1494420978e2f.txt', '2545e668e0aec646.txt', '264b2907355a6120.txt', '26c1751789680627.tx
t', '27b6388dc23572a9.txt', '284d750faa30c559.txt', '2989bbce8e68fa81.txt', '2b2de85daa1b86c0.txt', '2b5f85c29ca07571.txt', '2
d443d035ea0fb99.txt', '2dc7d66fe3caee44.txt', '2e58422bde5c8774.txt', '33498124d9d6d090.txt', '347c1a4e2ded4d2e.txt', '3ae269b
edef83635.txt', '3afbb256db902703.txt', '3b4b455be1b15ebf.txt', '3be3e51838893b1a.txt', '3f08f131364c97f8.txt', '3fd8e449d104a
036.txt', '4102637b90f22501.txt', '427027445624f9d7.txt', '42dc745b06d2e191.txt', '46599d51ac85b3b0.txt', '4688fc4698044cfa.tx
t', '4776c6a80e1d16eb.txt', '47e5f8e93f861a31.txt', '49f869604e730324.txt', '4b96399818d42fb9.txt', '4d8ec5427f7a8eff.txt', '4
de82c94ac2a7b7a.txt', '4e56b00c07626ca8.txt', '4fa47ce9a883b913.txt', '4fc34cd3bc072665.txt', '50428ab76f1b6bbb.txt', '5077f10
4322ec20a.txt', '521054cf6e22d236.txt', '5427d81773e2b00f.txt', '54722326341c5200.txt', '593d7839d6c2809a.txt', '59c041bb3fce0
6a5.txt', '5cc23dede717a4d3.txt', '5d2affc21049fdbe.txt', '5e371acb01c9fb82.txt', '5f589f615fb1c55e.txt', '5f8ba7459c484be4.tx
t', '60977f47c9b40119.txt', '60e4a5d68eca5b26.txt', '6251f255d50131a1.txt', '629afb134fdb594b.txt', '6329e30e34e67a3d.txt', '6
346d5c95f0b1608.txt', '63b91382250a2464.txt', '641823263ee72ae8.txt', '657b4f6a95dd04d1.txt', '6804cacab839efea.txt', '6a00aed
ffc609342.txt', '6c649311971348bc.txt', '6ce054654faf8917.txt', '6fe927f9795941e0.txt', '70d5d4e7f4569c1d.txt', '70f41566b7b03
823.txt', '71832149896cc81c.txt', '71e3f14d6b0f9a07.txt', '7449c7ee483d930a.txt', '75523a140e02cf80.txt', '75784b7ac0063202.tx
t', '76628f2d7c8dede2.txt', '76b341ae9b9b29fe.txt', '7767f7189aeeb7dc.txt', '7836a84e2a3b9c38.txt', '783b5541c82b80a8.txt', '7
8e844d60a48d727.txt', '7b015dca3d10a0c6.txt', '7b308b65a942e67d.txt', '7c375183b1020791.txt', '7d83e1cfd97e1ab5.txt', '7d910b9
e81fae34f.txt', '7e53bbc69ee00f84.txt', '7fa2ccccafc494f5.txt', '80c953c8dbea65e3.txt', '80dc7656edd319fb.txt', '818d7adffeedb
6d3.txt', '82b95a3aedf71712.txt', '82e69de1c2388f58.txt', '82fd1036a66bfc47.txt', '84f0d2ab21918b21.txt', '850e97f8eef9bfc1.tx
t', '87466bb270c7c97c.txt', '87a8890d7d33a558.txt', '88a32064e7c6912f.txt', '8b0a85dab4112369.txt', '8fa3ce96d44da56a.txt', '8
fe7cdf057597d1c.txt', '925dc0c546921279.txt', '954baaf90a6905f9.txt', '9721db176f9caec6.txt', '97f850eac4621c0f.txt', '99dd37a
6d8331a24.txt', '9b230487db2cd57c.txt', '9b7036d62a4ba7b5.txt', '9bf1b69f46679c45.txt', '9bfb37490e1056a6.txt', '9c58ed712fefd
3b0.txt', '9d11f3ef178693b0.txt', '9de10d2dda3b2c47.txt', '9eeb0e03d811cb97.txt', '9f8cf2766781bc19.txt', 'a4ba420668d004b2.tx
t', 'a7e83a23d43b263d.txt', 'a89b7ff2add0163b.txt', 'a8cbbda7d3f8ad63.txt', 'adcedd24164dcbcc.txt', 'ae82a7ecba83d336.txt', 'a
fbc4b19c8d9057c.txt', 'b036d13a42b79b77.txt', 'b153fade49be06fb.txt', 'b3d673b2e7f0379e.txt', 'b425c992c4b89cde.txt', 'b463bbe
134774e06.txt', 'b543d814a6888896.txt', 'b8a3c2468858e071.txt', 'bb2298b4554d8042.txt', 'bb4c325c417274b4.txt', 'bbbd56c86404c
f0e.txt', 'bf9d081c7ffcd7dd.txt', 'c0086587ad8ecde6.txt', 'c0331d3b867a40a7.txt', 'c1c5c382c31e34e4.txt', 'c2d52cd7eb6066cf.tx
t', 'c3c6edf2ce5c21ea.txt', 'c400111dd3d15de0.txt', 'c47c6518b8ea2bd8.txt', 'c687ede0bff60196.txt', 'c826343c1cdee0df.txt', 'c
a7e18d4464d2d2c.txt', 'cad6f8fee2310057.txt', 'cc950da2b4f531cc.txt', 'cd29ad86f5397fb1.txt', 'd09fdb5bf47a8865.txt', 'd33d5b6
62ffba4ea.txt', 'd41a2f487d38064e.txt', 'd48e28f99387ae27.txt', 'd529465ced2446c0.txt', 'd5b9c0a8082fff00.txt', 'd7269c18493a7
0d1.txt', 'd9015bc9d07c9044.txt', 'd9889bf56863a014.txt', 'da22a4135b41ec7a.txt', 'da5f5a1b57742751.txt', 'dd9109d5f9bc0bef.tx
t', 'e0f4f4d688129063.txt', 'e51c91ec121cddf2.txt', 'e75dc8f45666c4b9.txt', 'e9787a5ec72db00a.txt', 'ea9423a18705af64.txt', 'e
af962ccf7c49596.txt', 'eb04489a00c9c43e.txt', 'eb44fb106fa2457b.txt', 'eb674c106748f203.txt', 'ef1843c6ca891bb5.txt', 'efa08ac
ef32ae57c.txt', 'f06bc9642643b998.txt', 'f074d5978af8dcef.txt', 'f1959f455f3774b4.txt', 'f33d8d0b4f60afc8.txt', 'f77d192e69492
f9a.txt', 'fad50df61cc71577.txt', 'fe77ef455ba5876f.txt', 'ffa3ad283bab4e00.txt']
```

```
# Processing the labeling files in the testing dataset and generating output files with encoded bounding box coordinates in the "yolo/test/labels" directory
process_files("/content/drive/MyDrive/MyAnimalsDataset/test","yolo/test/labels")
```

```
Bear
['0df78ee76bafd3a9.txt', '0f899aca6d0fb6e1.txt', '1cca48c57103a42c.txt', '1fa809bf6cf5ea36.txt', '200046eca85cd992.txt', '23bf
858cb1d0ef63.txt', '23d1d39d81d411da.txt', '322e901e952ea866.txt', '3d77555f2ede0b38.txt', '3df2b6a098712fee.txt', '41b188a87b
9cb7d9.txt', '50100f0b149c5668.txt', '5e4722478ab9c699.txt', '685ec158610ee9c3.txt', '6c413bd13881e4ea.txt', '77d8f1427530d52
c.txt', '835f500b4f18425a.txt', '84c540da3f9e5436.txt', '8c3a0db73abdfed4.txt', '981ff8cfd891a39a.txt', '9e411cef88b11bb7.tx
t', 'a043c1c94c493735.txt', 'a725b87082af9473.txt', 'aadda77be1e8bc0b.txt', 'ab68f7a2c2575ff6.txt', 'ae4e59f858eb042a.txt', 'a
ea7138636948eee.txt', 'b2d92399ba4b0328.txt', 'bb2d5daedea06da5.txt', 'bcd925c7811ff07b.txt', 'c087a950d5217c13.txt', 'c95acf6
6771a868e.txt', 'cb48bf7102604c06.txt', 'cbcd47e43104de25.txt', 'de4f80f11b9dcb1b.txt', 'eab56e74f42e5286.txt', 'ee8b8d14a20aa
ca8.txt', 'f0cd1050b09dd625.txt', 'fc5221a9c7909df6.txt']
Bull
['04d9cced0dd42e6c.txt', '089cef3acc866627.txt', '0e2004910f2bf847.txt', '177351a9b4f0356a.txt', '1bfd365238e1fedd.txt', '1f28
6c4bb30960f5.txt', '210734f80256d6a4.txt', '220effd28096ff0f.txt', '240d2e0a9b4cc7b0.txt', '249f655af433fc41.txt', '3120dc28ef
fd89b7.txt', '31704c4bf3f82eae.txt', '3ef83fdb8602626c.txt', '45b88fb978d91d15.txt', '4cc5986403f5d736.txt', '4d211ac255f269a
6.txt', '4f217eee30c07d91.txt', '513a11ee2d82e5d0.txt', '52c1444f43fb1fdc.txt', '54d1938b52d58f5d.txt', '5648bde7fdfd9766.tx
t', '56532d6cffe0c917.txt', '57f06d0f4217e496.txt', '591f0f9c5c0dade6.txt', '5ba9cb0d0289bc9c.txt', '5eb01f9bdae4a5d3.txt', '6
28c2b7421525cd2.txt', '6446325073d9c356.txt', '64b0e4fb38df21b8.txt', '6581250accb252b5.txt', '6800bfecec8b98d8.txt', '680597f
c57d29159.txt', '6cf42e1eff41dd3d.txt', '6e7fbb17c2aeadbb.txt', '74b8a8da46a94023.txt', '7542f12b9f06682b.txt', '79a5b1614a2dd
857.txt', '8231cd6ada6f0cd1.txt', '82491249a052c78a.txt', '831b342987fd22ca.txt', '8946e4b6f78cbc6b.txt', '8d373d638e47e9a2.tx
t', '91e4f9b22fa0cc97.txt', '97316fe963138baa.txt', '98ef2df73dc488e8.txt', '9a24464b368bcb0e.txt', '9c53ba2dcc734b28.txt', '9
cd8725a3b937c09.txt', 'a9dbaa2ef7acda02.txt', 'ad10853e21a21062.txt', 'aed3da55e0bc6852.txt', 'afac8875d2dadaf3.txt', 'b39cbec
447cd153c.txt', 'b45f0e088ba581f2.txt', 'b7f0609738220d71.txt', 'bd4ad102b75e74e8.txt', 'c1b64e7fb373e00b.txt', 'c3303c6efac85
6be.txt', 'c6737278e2845421.txt', 'd041792794f559c0.txt', 'd4a12f39f0c09788.txt', 'd7911bf5ab8d4af1.txt', 'd9d1326a08756178.tx
t', 'db593a5fa38b8b9d.txt', 'e03972d97713fb2c.txt', 'e4b15d99c00bf127.txt', 'e9fef8a8ea75cdd3.txt', 'ebc3f0f2b65b7b54.txt', 'e
c1ef7a131eea280.txt', 'f8026ea33c54be8b.txt', 'f952ecc795233e69.txt', 'fe438b6c53fed113.txt', 'ffce46ce278e7579.txt']
Cheetah
['08082ce94a10bc89.txt', '0948096c93514045.txt', '0af88c7a8b7195c7.txt', '1000b4c99a3d806f.txt', '1728d27e56111e6a.txt', '180c
f9419e379c58.txt', '194fe0a9a14f74fe.txt', '1b153b4ebae85924.txt', '2c3d0a534df8d496.txt', '3982e9cda647fbfb.txt', '5266c52bc5
63a0e8.txt', '5d3e7cc38df45a53.txt', '6ecb62ca4001150a.txt', '6fa28785a6f18510.txt', '71b66d3ad245c793.txt', '7b82b9cd50800ad
4.txt', '7cecb82db46f2b58.txt', '7d58af9b99b67916.txt', '86411d79db734687.txt', '90554528a1de8d07.txt', 'a131b39e7ac80813.tx
t', 'a36452b216f5f04f.txt', 'ae75658062c0bb2a.txt', 'af68f718feafbdbb.txt', 'b29eff5324e83f4b.txt', 'b3ace0bde1e54f25.txt', 'b
b2cce858b94dd7a.txt', 'c2d37ec8fba5afff.txt', 'c8c8743362f0e115.txt', 'd920a39f8f39bdf5.txt', 'e2c3815942f24b6b.txt', 'ea3ffc9
6c43f7776.txt', 'eae523c4abdc94d6.txt', 'eb586148de2fbe3b.txt', 'f1a745fb9367ab13.txt']
Elephant
['028f8db193a85ecf.txt', '0ba8f4463ed0513f.txt', '140a529acb32f8d1.txt', '1a676e236a83f4ec.txt', '1de68e44f26155a7.txt', '2266
93882e6bfe60.txt', '2a9394aafbe6e9fa.txt', '2b3dcc603147288c.txt', '38bb2af3d81205f1.txt', '5822443eb38effae.txt', '5854c8db07
d3cb8e.txt', '5d302522846d3802.txt', '81bf5ea035310aab.txt', '844b93dcf0cd2fab.txt', '86d527a1738e992e.txt', '888adad3e55ecd6
2.txt', '8e5bcba4482105b2.txt', '9b6ec0f67f99eb2c.txt', 'a5e1d70d617dafd0.txt', 'aacdf1fb4f6be637.txt', 'afe3cbb52cc563f3.tx
t', 'c06b91a7e28208aa.txt', 'c0903de35772c5f7.txt', 'ce5fcff35f33116b.txt', 'cf88e3898d775892.txt', 'dd719b5eed21fe35.txt', 'd
eb9c6214265ddad.txt', 'df2a95a909c2058f.txt', 'dfb066fe241bc54f.txt', 'dfc490f02bd3ccb5.txt', 'e29a75bf7ef197b0.txt', 'ee5a6c4
8cf7a0c69.txt', 'f52114700356643a.txt']
```

```
Crocodile
['0138fb77f3a3f70d.txt', '01981fb00cd5d947.txt', '032026a9f3bfd4fa.txt', '050d89cfd37ab14f.txt', '11ba9ac09fe7d8b6.txt', '11d9
ebec7ec1b649.txt', '136a7c94de7c61dd.txt', '1a5f515be50a4b19.txt', '1aadfafad885f2a1.txt', '1e196a69ca240e51.txt', '1e3abe29e3
5739a9.txt', '2259a6c737ccafa4.txt', '2c788bf165f7ee2c.txt', '2cb608d3dee43688.txt', '2fc1fc08190a3217.txt', '373163ac385c97b
1.txt', '3b3006dc6f72f9dc.txt', '42e8124f64e78d37.txt', '47f118de6a3212fb.txt', '4dfe5cd60fb2f45a.txt', '514a01f200c4bec9.tx
t', '556f22bb5de3d31a.txt', '55beeaa5d4e36bff.txt', '5a40f71acc3a2400.txt', '64407f8099747e3a.txt', '66aa8a11caf50c37.txt', '6
6c30b862ae004b3.txt', '683de1d6adff3b7a.txt', '69a985506a4cca1d.txt', '6d0f05a15ce90911.txt', '6f5b1b82d5fed970.txt', '73c4ff3
138c123df.txt', '743fbd0c4c3a167b.txt', '77e32d1561fee28b.txt', '7c9ee0105ce4f0df.txt', '7dbf64bf820bd2ef.txt', '86181d66e7159
023.txt', '8e4ad7b9603b0912.txt', '902a575d0ec97565.txt', '929e6b922fb042af.txt', '949e8fc796ad8771.txt', '95483dcc4360b758.tx
t', '99287db625a393b5.txt', '9a859eee7f88fe45.txt', 'a3fb9c6f7ee8b729.txt', 'a60bcc594b453c5d.txt', 'a68aa77743223816.txt', 'a
a99bf598ae2078e.txt', 'ae54bae115065242.txt', 'b0455171c8e5656e.txt', 'b0c5f596e992ada2.txt', 'b6f58b8e7add4b44.txt', 'b80d4d9
e784c2190.txt', 'bbff4ee30d6ac044.txt', 'bd244b2c4c5ed86b.txt', 'bf6f178e677de104.txt', 'c3fad9fca117b870.txt', 'c52d7d8acbad6
203.txt', 'cce918ca79f2c632.txt', 'ce0d8a2bc8b74591.txt', 'cf1f83331aa6470b.txt', 'cf2e597208f97df1.txt', 'd05ae0aaa7f27bba.tx
t', 'd0d135928962af70.txt', 'd4ca2b89d093e224.txt', 'd77a167ab3960a03.txt', 'e254888765fd0d7e.txt', 'e511ed26ba6762d2.txt', 'e
7a734474dc80e48.txt', 'ebcaf41e7a36d87b.txt', 'ec49f194f3a6b305.txt', 'ef1702259c37e60b.txt', 'f0461d91314fac2e.txt', 'f944966
23ca173a5.txt', 'f97bea9315ea71ed.txt', 'fd4c8972e97d4f3d.txt']
Crocodile
['0138fb77f3a3f70d.txt', '01981fb00cd5d947.txt', '032026a9f3bfd4fa.txt', '050d89cfd37ab14f.txt', '11ba9ac09fe7d8b6.txt', '11d9
ebec7ec1b649.txt', '136a7c94de7c61dd.txt', '1a5f515be50a4b19.txt', '1aadfafad885f2a1.txt', '1e196a69ca240e51.txt', '1e3abe29e3
5739a9.txt', '2259a6c737ccafa4.txt', '2c788bf165f7ee2c.txt', '2cb608d3dee43688.txt', '2fc1fc08190a3217.txt', '373163ac385c97b
1.txt', '3b3006dc6f72f9dc.txt', '42e8124f64e78d37.txt', '47f118de6a3212fb.txt', '4dfe5cd60fb2f45a.txt', '514a01f200c4bec9.tx
t', '556f22bb5de3d31a.txt', '55beeaa5d4e36bff.txt', '5a40f71acc3a2400.txt', '64407f8099747e3a.txt', '66aa8a11caf50c37.txt', '6
6c30b862ae004b3.txt', '683de1d6adff3b7a.txt', '69a985506a4cca1d.txt', '6d0f05a15ce90911.txt', '6f5b1b82d5fed970.txt', '73c4ff3
138c123df.txt', '743fbd0c4c3a167b.txt', '77e32d1561fee28b.txt', '7c9ee0105ce4f0df.txt', '7dbf64bf820bd2ef.txt', '86181d66e7159
023.txt', '8e4ad7b9603b0912.txt', '902a575d0ec97565.txt', '929e6b922fb042af.txt', '949e8fc796ad8771.txt', '95483dcc4360b758.tx
t', '99287db625a393b5.txt', '9a859eee7f88fe45.txt', 'a3fb9c6f7ee8b729.txt', 'a60bcc594b453c5d.txt', 'a68aa77743223816.txt', 'a
a99bf598ae2078e.txt', 'ae54bae115065242.txt', 'b0455171c8e5656e.txt', 'b0c5f596e992ada2.txt', 'b6f58b8e7add4b44.txt', 'b80d4d9
e784c2190.txt', 'bbff4ee30d6ac044.txt', 'bd244b2c4c5ed86b.txt', 'bf6f178e677de104.txt', 'c3fad9fca117b870.txt', 'c52d7d8acbad6
203.txt', 'cce918ca79f2c632.txt', 'ce0d8a2bc8b74591.txt', 'cf1f83331aa6470b.txt', 'cf2e597208f97df1.txt', 'd05ae0aaa7f27bba.tx
t', 'd0d135928962af70.txt', 'd4ca2b89d093e224.txt', 'd77a167ab3960a03.txt', 'e254888765fd0d7e.txt', 'e511ed26ba6762d2.txt', 'e
7a734474dc80e48.txt', 'ebcaf41e7a36d87b.txt', 'ec49f194f3a6b305.txt', 'ef1702259c37e60b.txt', 'f0461d91314fac2e.txt', 'f944966
23ca173a5.txt', 'f97bea9315ea71ed.txt', 'fd4c8972e97d4f3d.txt']
Jaguar
['0af88c7a8b7195c7.txt', '1000b4c99a3d806f.txt', '1457c3c3d19f6d3d.txt', '1678bb8be6fd2304.txt', '1728d27e56111e6a.txt', '180c
f9419e379c58.txt', '194fe0a9a14f74fe.txt', '2c3d0a534df8d496.txt', '2dd34d29d1d4d967.txt', '35630a24d9a09a81.txt', '3982e9cda6
47fbfb.txt', '431924bd56ebb5b7.txt', '43ea06e46d2d0f29.txt', '47d761bff9d5fe5b.txt', '5266c52bc563a0e8.txt', '5d3e7cc38df45a5
3.txt', '70102069057d5929.txt', '760931f98b3d9f5e.txt', '7cecb82db46f2b58.txt', '86411d79db734687.txt', '867a5cc638b69cdb.tx
t', '971d8a9d698286b5.txt', '9c04a92390b3c631.txt', 'a36452b216f5f04f.txt', 'af68f718feafbdbb.txt', 'b48f3557de803f23.txt', 'b
b2cce858b94dd7a.txt', 'c2d37ec8fba5afff.txt', 'c79909bb2d1d9698.txt', 'cbd62faab2a5f21f.txt', 'd38ad8665f614795.txt', 'e2c3815
942f24b6b.txt', 'e64013f585047d23.txt', 'e6c56d35407292d2.txt', 'eae523c4abdc94d6.txt', 'ec1307708fab8647.txt', 'f1a745fb9367a
b13.txt', 'f23046befd27a2bb.txt']
Leopard
['08082ce94a10bc89.txt', '0af88c7a8b7195c7.txt', '1000b4c99a3d806f.txt', '1457c3c3d19f6d3d.txt', '1678bb8be6fd2304.txt', '1728
d27e56111e6a.txt', '180cf9419e379c58.txt', '18b49ad93bb9012a.txt', '194fe0a9a14f74fe.txt', '1b153b4ebae85924.txt', '2c3d0a534d
f8d496.txt', '2dd34d29d1d4d967.txt', '35630a24d9a09a81.txt', '36db89e481d6b26f.txt', '3982e9cda647fbfb.txt', '3c299471d677028
7.txt', '431924bd56ebb5b7.txt', '43ea06e46d2d0f29.txt', '47d761bff9d5fe5b.txt', '4b190c171acfeb63.txt', '4c5f3c9fbf36f99c.tx
t', '5266c52bc563a0e8.txt', '595839014f60f4f1.txt', '5d3e7cc38df45a53.txt', '6fa28785a6f18510.txt', '70102069057d5929.txt', '7
1b66d3ad245c793.txt', '7a76879fc9f72265.txt', '7b82b9cd50800ad4.txt', '7cecb82db46f2b58.txt', '7d58af9b99b67916.txt', '86411d7
9db734687.txt', '867a5cc638b69cdb.txt', '8edd9104c84e111f.txt', '971d8a9d698286b5.txt', '9a8b69cffab97ee2.txt', 'a131b39e7ac80
813.txt', 'a36452b216f5f04f.txt', 'a77cb2047087e508.txt', 'af68f718feafbdbb.txt', 'b29eff5324e83f4b.txt', 'b3ace0bde1e54f25.tx
t', 'b48f3557de803f23.txt', 'bb2cce858b94dd7a.txt', 'c2d37ec8fba5afff.txt', 'c79909bb2d1d9698.txt', 'c8c8743362f0e115.txt', 'c
bd62faab2a5f21f.txt', 'd0ac965609150f85.txt', 'd38ad8665f614795.txt', 'd920a39f8f39bdf5.txt', 'e64013f585047d23.txt', 'e75817d
785c5ec44.txt', 'eae523c4abdc94d6.txt', 'eb586148de2fbe3b.txt', 'ec1307708fab8647.txt', 'f1a745fb9367ab13.txt']
Lion
['0149d723dbc0d724.txt', '03b9630d0ba5749d.txt', '03bacd7be83b721e.txt', '06e9b526a94fb4ef.txt', '08b6978e96007bfe.txt', '08e3
bd71231faa7c.txt', '0abe5e4f09bc1262.txt', '0c13fc8f316fbf64.txt', '0fb728cd2b86cb10.txt', '14dba23948cf4ecd.txt', '15995ad37d
077a54.txt', '1cdf54e23522721f.txt', '1ebb36368847d8c9.txt', '209a730031941da7.txt', '21b0a18099394d3f.txt', '21dfe5721a39e64
7.txt', '2714b054d4e7d4ed.txt', '2759665ea086956a.txt', '27eea2d0cf6618aa.txt', '29910133de9c9f32.txt', '2b42f3325e3be31b.tx
t', '2e7636f4a945129e.txt', '2f2c0984cb427e81.txt', '2fc33f14c91f74d7.txt', '320320e0a5ae5375.txt', '3259ead2f4e02ba2.txt', '3
452ab13dfd7cd45.txt', '37968c5f1b3ac4fa.txt', '3bb7558c430c06de.txt', '3cd87292fc5757dc.txt', '450f18ba8939e75d.txt', '4b356e7
4c4f14ef8.txt', '4d51b08a4f17a99e.txt', '5069d2a610a2081c.txt', '54eb04cc46cf8d07.txt', '57370d36110080f6.txt', '573ca1d8f41e1
307.txt', '576349a03b599011.txt', '61f9e2ac8b438a2f.txt', '63eea08ae3c49842.txt', '697918b27c87dafb.txt', '6d491fd917b1fd5b.tx
t', '700e3413c0265494.txt', '701c911cea93ce43.txt', '715e4213a3d83b74.txt', '719d511b89435268.txt', '73e2ddabd76d5ed5.txt', '7
890df47b3257865.txt', '7b8c61750337f348.txt', '7d2fa667bc6a1d22.txt', '7fbdfa7a631ab80a.txt', '81b2918c96e822f0.txt', '82c8910
a52fff476.txt', '84b473491eee4048.txt', '84ed8a69d32f711a.txt', '8518685e18c575cb.txt', '86615394c4e091b4.txt', '8804765f4ac22
56f.txt', '8db3fc5215a9c843.txt', '8e4ca713322023fb.txt', '8ef80eccf3b849ec.txt', '96bcc3299767c893.txt', '9b4b421bd3eaf87e.tx
t', '9c9f2ddd776ff540.txt', '9eb8c00476b11c89.txt', '9eddca00ad17d67d.txt', 'a272513c7358ca7d.txt', 'a34d708f38bd9e9d.txt', 'a
6c716e30eefa99e.txt', 'a7bd1c948a850e4a.txt', 'a9b100339d015330.txt', 'ac70aba7248501c0.txt', 'b12e88cb93dbf233.txt', 'b23541c
2fc27aa34.txt', 'b431c3e8cdc7f00a.txt', 'b599de15942b666f.txt', 'bd18d41af969b93f.txt', 'bd571b4371556fcc.txt', 'be77eecbe69e0
33e.txt', 'bf3f6dcd07c13522.txt', 'c24ae0da6b36db2b.txt', 'c27dcf5ffc4542bf.txt', 'c47eda2eb01b31b3.txt', 'd030fac2d777096d.tx
t', 'd44055b2636d2217.txt', 'd84394ff2a5e91f7.txt', 'da7899bdbce7ddaa.txt', 'e1a409e586816608.txt', 'e356146c5ac57de5.txt', 'e
3675b7c2c057b11.txt', 'e402cf9d4dd090d5.txt', 'e4bbba6a606610c1.txt', 'e73188a53fcd9627.txt', 'ed69d84a8b2cf6a3.txt', 'f700eef
ef47341de.txt', 'f91abb11d7102ec1.txt', 'f960ed9faebc8ffa.txt', 'fa34e353d3d221d5.txt', 'fbcc052b0bef4381.txt', 'fdae04691118e
ecb.txt']
Rhinoceros
['23a8613d995053f2.txt', '27e491edd2b724f0.txt', '27fbbae5dcf7fd2d.txt', '283263de5f68530b.txt', '2d0ec633c59c338f.txt', '2e3a
7f4b6057b388.txt', '3692e03dd82e6715.txt', '37aae17410666a9e.txt', '5017793f6c1e07b3.txt', '561c4dccbbfb86f1.txt', '5b114f6293
d03617.txt', '63d24ec6e5cda6a2.txt', '670fd224212457ec.txt', '689aa58819f90a00.txt', '6defd81749de10a0.txt', '6e160a32c1d8c2b
a.txt', '740131f6435881e2.txt', '7852ce66a5ef301c.txt', '7a7ca621acbc88f9.txt', '7d6831a3a2e0baff.txt', '7ffaca9685d941e1.tx
t', '9396771294f1ff72.txt', '9b6351d29d8472d8.txt', 'a4d93e14067ae203.txt', 'ab2d7eb4a12f6c0a.txt', 'b8f572c6cbbd09f2.txt', 'b
abea9bf2f16e326.txt', 'd0d7d7fdffb843bf.txt', 'd24b178b20a352e0.txt', 'd91d3e2e0b1e77dd.txt', 'e7a88a5a9c907e10.txt', 'f178214
77f5f4690.txt', 'f49b39356ee510f4.txt', 'fdb0b4e404526bc9.txt']
```

```
Tiger
['070dcde6a1840553.txt', '10252184ee1b2c08.txt', '13ecf652a65aed8d.txt', '1ebb36368847d8c9.txt', '1ed32f9b21e2f5c5.txt', '2415
f9c2b9b49131.txt', '30668bb31c054912.txt', '43a0563f55cbd083.txt', '4bd38abc7c37051e.txt', '58bfa6acf035a8ab.txt', '6a27863dcb
622a64.txt', '7c6795384114a1ef.txt', '8728e9fa662a8921.txt', '8edd9104c84e111f.txt', '9af48bcf5b44d500.txt', 'a37bf2c77480fa6
6.txt', 'a4fefa5125934afb.txt', 'a77cb2047087e508.txt', 'ad2655f3ea6d3073.txt', 'd1cee07bd106c72b.txt', 'd71c0755796574eb.tx
t', 'e62e98945e2f1717.txt', 'e634e1040c33449f.txt', 'e9a8ff9828c4baa4.txt', 'e9c88dc5f7c66ead.txt', 'ff7abc612e454eae.txt']
```

```
# Cloning the YOLOv5 repository, navigating to the cloned directory, and installing the required dependencies
!git clone https://github.com/ultralytics/yolov5.git
%cd yolov5
%pip install -r requirements.txt
```

```
Cloning into 'yolov5'...
remote: Enumerating objects: 16000, done.
remote: Counting objects: 100% (169/169), done.
remote: Compressing objects: 100% (84/84), done.
remote: Total 16000 (delta 103), reused 130 (delta 85), pack-reused 15831
Receiving objects: 100% (16000/16000), 14.59 MiB | 10.68 MiB/s, done.
Resolving deltas: 100% (10977/10977), done.
/content/yolov5
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting gitpython>=3.1.30 (from -r requirements.txt (line 5))
  Downloading GitPython-3.1.31-py3-none-any.whl (184 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 184.3/184.3 kB 20.0 MB/s eta 0:00:00
Requirement already satisfied: matplotlib>=3.3 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 6))
(3.7.1)
Requirement already satisfied: numpy>=1.18.5 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 7))
(1.22.4)
Requirement already satisfied: opencv-python>=4.1.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line
8)) (4.7.0.72)
Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 9))
(8.4.0)
Requirement already satisfied: psutil in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 10)) (5.9.5)
Requirement already satisfied: PyYAML>=5.3.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 11))
(6.0)
Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 1
2)) (2.27.1)
Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 13))
(1.10.1)
Collecting thop>=0.1.1 (from -r requirements.txt (line 14))
  Downloading thop-0.1.1.post2209072238-py3-none-any.whl (15 kB)
Requirement already satisfied: torch>=1.7.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 15))
(2.0.1+cu118)
Requirement already satisfied: torchvision>=0.8.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 1
6)) (0.15.2+cu118)
Requirement already satisfied: tqdm>=4.64.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 17))
(4.65.0)
Collecting ultralytics>=8.0.111 (from -r requirements.txt (line 18))
  Downloading ultralytics-8.0.123-py3-none-any.whl (612 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 612.4/612.4 kB 58.1 MB/s eta 0:00:00
Requirement already satisfied: pandas>=1.1.4 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 27))
(1.5.3)
Requirement already satisfied: seaborn>=0.11.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 28))
(0.12.2)
Requirement already satisfied: setuptools>=65.5.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 4
2)) (67.7.2)
Collecting gitdb<5,>=4.0.1 (from gitpython>=3.1.30->-r requirements.txt (line 5))
  Downloading gitdb-4.0.10-py3-none-any.whl (62 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 62.7/62.7 kB 10.9 MB/s eta 0:00:00
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requireme
nts.txt (line 6)) (1.1.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requirements.
txt (line 6)) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requirem
ents.txt (line 6)) (4.40.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requirem
ents.txt (line 6)) (1.4.4)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requiremen
ts.txt (line 6)) (23.1)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requireme
nts.txt (line 6)) (3.1.0)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3->-r requi
rements.txt (line 6)) (2.8.2)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r req
uirements.txt (line 12)) (1.26.16)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requir
ements.txt (line 12)) (2023.5.7)
Requirement already satisfied: charset-normalizer~=2.0.0 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r
requirements.txt (line 12)) (2.0.12)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirement
```

```
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirement
s.txt (line 12)) (3.4)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (li
ne 15)) (3.12.2)
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirement
s.txt (line 15)) (4.6.3)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line
15)) (1.11.1)
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (li
ne 15)) (3.1)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line
15)) (3.1.2)
Requirement already satisfied: triton==2.0.0 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.tx
t (line 15)) (2.0.0)
Requirement already satisfied: cmake in /usr/local/lib/python3.10/dist-packages (from triton==2.0.0->torch>=1.7.0->-r requirem
ents.txt (line 15)) (3.25.2)
Requirement already satisfied: lit in /usr/local/lib/python3.10/dist-packages (from triton==2.0.0->torch>=1.7.0->-r requiremen
ts.txt (line 15)) (16.0.6)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas>=1.1.4->-r requirements.tx
t (line 27)) (2022.7.1)
Collecting smmap<6,>=3.0.1 (from gitdb<5,>=4.0.1->gitpython>=3.1.30->-r requirements.txt (line 5))
  Downloading smmap-5.0.0-py3-none-any.whl (24 kB)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib>=3.3
->-r requirements.txt (line 6)) (1.16.0)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from jinja2->torch>=1.7.0->-r requi
rements.txt (line 15)) (2.1.3)
Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.10/dist-packages (from sympy->torch>=1.7.0->-r requireme
nts.txt (line 15)) (1.3.0)
Installing collected packages: smmap, gitdb, gitpython, ultralytics, thop
Successfully installed gitdb-4.0.10 gitpython-3.1.31 smmap-5.0.0 thop-0.1.1.post2209072238 ultralytics-8.0.123
```

```
# Creating an empty "animals.yaml" file in the "data" directory and listing the
contents of the "data" directory
!touch data/animals.yaml
%ls data
```

```
animals.yaml       coco.yaml              images/          VisDrone.yaml
Argoverse.yaml     GlobalWheat2020.yaml   Objects365.yaml  VOC.yaml
coco128-seg.yaml   hyps/                  scripts/         xView.yaml
coco128.yaml       ImageNet.yaml          SKU-110K.yaml
```

```
# Creating and writing the content to the "animals.yaml" file, specifying the paths,
image sets, and class names
with open("data/animals.yaml", "w") as yaml_file:
 yaml_file.write("path: ../yolo # train images (relative to 'path') 128 images"+"\n
 yaml_file.write("train: train/images # train images (relative to 'path') 128
images"+"\n")
 yaml_file.write("val: test/images # val images (relative to 'path') 128 images"+"\n
 yaml_file.write("names:"+"\n")
 yaml_file.write(" 0: Bear"+"\n")
 yaml_file.write(" 1: Bull"+"\n")
 yaml_file.write(" 2: Cheetah"+"\n")
 yaml_file.write(" 3: Crocodile"+"\n")
 yaml_file.write(" 4: Elephant"+"\n")
 yaml_file.write(" 5: Jaguar"+"\n")
 yaml_file.write(" 6: Leopard"+"\n")
 yaml_file.write(" 7: Lion"+"\n")
 yaml_file.write(" 8: Rhinoceros"+"\n")
 yaml_file.write(" 9: Tiger"+"\n")
```

```
# Initiating the training process for the YOLOv5 model with specified configurations
and parameters
!python train.py --img 640 --batch 32 --epochs 30 --data animals.yaml --weights
yolov5s.pt --project runs/train
```

```
train: weights=yolov5s.pt, cfg=, data=animals.yaml, hyp=data/hyps/hyp.scratch-low.yaml, epochs=30, batch_size=32, imgsz=640, r
ect=False, resume=False, nosave=False, noval=False, noautoanchor=False, noplots=False, evolve=None, bucket=, cache=None, image
_weights=False, device=, multi_scale=False, single_cls=False, optimizer=SGD, sync_bn=False, workers=8, project=runs/train, nam
e=exp, exist_ok=False, quad=False, cos_lr=False, label_smoothing=0.0, patience=100, freeze=[0], save_period=-1, seed=0, local_
rank=-1, entity=None, upload_dataset=False, bbox_interval=-1, artifact_alias=latest
github: up to date with https://github.com/ultralytics/yolov5 ✅
YOLOv5 🚀 v7.0-186-g0acc5cf Python-3.10.12 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)

hyperparameters: lr0=0.01, lrf=0.01, momentum=0.937, weight_decay=0.0005, warmup_epochs=3.0, warmup_momentum=0.8, warmup_bias_
lr=0.1, box=0.05, cls=0.5, cls_pw=1.0, obj=1.0, obj_pw=1.0, iou_t=0.2, anchor_t=4.0, fl_gamma=0.0, hsv_h=0.015, hsv_s=0.7, hsv
_v=0.4, degrees=0.0, translate=0.1, scale=0.5, shear=0.0, perspective=0.0, flipud=0.0, fliplr=0.5, mosaic=1.0, mixup=0.0, copy
_paste=0.0
Comet: run 'pip install comet_ml' to automatically track and visualize YOLOv5 🚀 runs in Comet
TensorBoard: Start with 'tensorboard --logdir runs/train', view at http://localhost:6006/
Downloading https://ultralytics.com/assets/Arial.ttf to /root/.config/Ultralytics/Arial.ttf...
100% 755k/755k [00:00<00:00, 24.4MB/s]
Downloading https://github.com/ultralytics/yolov5/releases/download/v7.0/yolov5s.pt to yolov5s.pt...
100% 14.1M/14.1M [00:00<00:00, 18.2MB/s]

Overriding model.yaml nc=80 with nc=10

                 from  n    params  module                                  arguments
  0                -1  1      3520  models.common.Conv                      [3, 32, 6, 2, 2]
  1                -1  1     18560  models.common.Conv                      [32, 64, 3, 2]
  2                -1  1     18816  models.common.C3                        [64, 64, 1]
  3                -1  1     73984  models.common.Conv                      [64, 128, 3, 2]
  4                -1  2    115712  models.common.C3                        [128, 128, 2]
  5                -1  1    295424  models.common.Conv                      [128, 256, 3, 2]
  6                -1  3    625152  models.common.C3                        [256, 256, 3]
  7                -1  1   1180672  models.common.Conv                      [256, 512, 3, 2]
  8                -1  1   1182720  models.common.C3                        [512, 512, 1]
  9                -1  1    656896  models.common.SPPF                      [512, 512, 5]
 10                -1  1    131584  models.common.Conv                      [512, 256, 1, 1]
 11                -1  1         0  torch.nn.modules.upsampling.Upsample    [None, 2, 'nearest']
 12           [-1, 6]  1         0  models.common.Concat                    [1]
 13                -1  1    361984  models.common.C3                        [512, 256, 1, False]
 14                -1  1     33024  models.common.Conv                      [256, 128, 1, 1]
 15                -1  1         0  torch.nn.modules.upsampling.Upsample    [None, 2, 'nearest']
 16           [-1, 4]  1         0  models.common.Concat                    [1]
 17                -1  1     90880  models.common.C3                        [256, 128, 1, False]
 18                -1  1    147712  models.common.Conv                      [128, 128, 3, 2]
 19          [-1, 14]  1         0  models.common.Concat                    [1]
 20                -1  1    296448  models.common.C3                        [256, 256, 1, False]
 21                -1  1    590336  models.common.Conv                      [256, 256, 3, 2]
 22          [-1, 10]  1         0  models.common.Concat                    [1]
 23                -1  1   1182720  models.common.C3                        [512, 512, 1, False]
 24      [17, 20, 23]  1     40455  models.yolo.Detect                      [10, [[10, 13, 16, 30, 33, 23], [30, 61, 62, 45, 5
9, 119], [116, 90, 156, 198, 373, 326]], [128, 256, 512]]
Model summary: 214 layers, 7046599 parameters, 7046599 gradients, 16.0 GFLOPs

Transferred 343/349 items from yolov5s.pt
AMP: checks passed ✅
optimizer: SGD(lr=0.01) with parameter groups 57 weight(decay=0.0), 60 weight(decay=0.0005), 60 bias
albumentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01, blur_limit=(3, 7)), ToGray(p=0.01), CLAHE(p=0.01, clip_lim
it=(1, 4.0), tile_grid_size=(8, 8))
train: Scanning /content/yolo/train/labels... 1375 images, 0 backgrounds, 0 corrupt: 100% 1375/1375 [00:01<00:00, 1138.51it/s]
train: New cache created: /content/yolo/train/labels.cache
val: Scanning /content/yolo/test/labels... 445 images, 0 backgrounds, 0 corrupt: 100% 445/445 [00:00<00:00, 569.73it/s]
val: New cache created: /content/yolo/test/labels.cache

AutoAnchor: 2.30 anchors/target, 1.000 Best Possible Recall (BPR). Current anchors are a good fit to dataset ✅
Plotting labels to runs/train/exp/labels.jpg...
Image sizes 640 train, 640 val
Using 2 dataloader workers
Logging results to runs/train/exp
Starting training for 30 epochs...

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
  0/29      6.75G    0.08666    0.02822     0.0643         90        640: 100% 43/43 [00:58<00:00,  1.37s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:09<00:00,  1.42s/it]
              all        445        498     0.0714      0.142     0.0823     0.0381

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
  1/29      8.37G    0.05195    0.01963    0.05624         98        640: 100% 43/43 [00:53<00:00,  1.25s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.23s/it]
              all        445        498      0.241      0.302     0.0805     0.0342
```

```
Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 7/29      8.37G    0.03962    0.01599    0.04346         75        640: 100% 43/43 [00:50<00:00,  1.18s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.54s/it]
             all        445        498      0.211       0.32      0.186      0.107

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 8/29      8.37G    0.03852    0.01578    0.04021         75        640: 100% 43/43 [00:50<00:00,  1.18s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.46s/it]
             all        445        498      0.337      0.358      0.266      0.157

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 9/29      8.37G    0.03797    0.01553    0.03924         71        640: 100% 43/43 [00:51<00:00,  1.20s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:09<00:00,  1.33s/it]
             all        445        498      0.328      0.405      0.322      0.159

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
10/29      8.37G    0.03728    0.01602    0.03505         79        640: 100% 43/43 [00:51<00:00,  1.20s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.44s/it]
             all        445        498      0.514      0.406      0.381      0.214

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
11/29      8.37G    0.03772    0.01553      0.036         82        640: 100% 43/43 [00:51<00:00,  1.19s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.46s/it]
             all        445        498      0.573      0.426      0.428      0.247

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
12/29      8.37G    0.03484    0.01504    0.03321         82        640: 100% 43/43 [00:50<00:00,  1.17s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.47s/it]
             all        445        498      0.409      0.459      0.422      0.251

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
13/29      8.37G    0.03743    0.01494     0.0351         89        640: 100% 43/43 [00:50<00:00,  1.17s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.52s/it]
             all        445        498      0.453       0.51      0.426      0.263

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
14/29      8.37G    0.03374    0.01494    0.03346         73        640: 100% 43/43 [00:50<00:00,  1.18s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.46s/it]
             all        445        498      0.604      0.492      0.528      0.311

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
15/29      8.37G    0.03392    0.01472    0.03044         82        640: 100% 43/43 [00:52<00:00,  1.21s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:09<00:00,  1.42s/it]
             all        445        498      0.474      0.546      0.491      0.315

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
16/29      8.37G    0.03119    0.01418    0.03001         76        640: 100% 43/43 [00:50<00:00,  1.19s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.55s/it]
             all        445        498      0.536      0.576      0.566      0.364

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
17/29      8.37G    0.03136    0.01391    0.02732         83        640: 100% 43/43 [00:51<00:00,  1.19s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.48s/it]
             all        445        498      0.482      0.548      0.532      0.337

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
18/29      8.37G    0.03043     0.0139    0.02881         88        640: 100% 43/43 [00:53<00:00,  1.24s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.24s/it]
             all        445        498      0.422      0.487      0.448      0.265

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
19/29      8.37G     0.0306    0.01371    0.02844         75        640: 100% 43/43 [00:52<00:00,  1.23s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.19s/it]
             all        445        498      0.471      0.537       0.53       0.35

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
20/29      8.37G    0.03117    0.01411    0.02667         80        640: 100% 43/43 [00:53<00:00,  1.25s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.16s/it]
             all        445        498      0.535      0.552      0.534      0.362

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
21/29      8.37G    0.03016    0.01343    0.02606         84        640: 100% 43/43 [00:54<00:00,  1.26s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.15s/it]
             all        445        498      0.485      0.511      0.545      0.364

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
22/29      8.37G    0.02857     0.0135    0.02373         95        640: 100% 43/43 [00:54<00:00,  1.26s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:08<00:00,  1.21s/it]
             all        445        498      0.664      0.564      0.568      0.379

Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
23/29      8.37G     0.0282    0.01338    0.02475         84        640: 100% 43/43 [00:52<00:00,  1.22s/it]
           Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:09<00:00,  1.31s/it]
             all        445        498      0.559      0.553      0.579      0.395
```

```
 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 24/29      8.37G    0.02644    0.01306    0.02252         85        640: 100% 43/43 [00:51<00:00,  1.20s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:09<00:00,  1.39s/it]
              all        445        498      0.546      0.578      0.572      0.392

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 25/29      8.37G    0.02616    0.01283    0.02169         79        640: 100% 43/43 [00:51<00:00,  1.20s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.46s/it]
              all        445        498      0.565      0.581      0.584      0.407


 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 26/29      8.37G    0.02624    0.01275    0.02098         84        640: 100% 43/43 [00:51<00:00,  1.19s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.46s/it]
              all        445        498      0.512       0.64      0.601      0.428

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 27/29      8.37G    0.02343    0.01223    0.01843         80        640: 100% 43/43 [00:51<00:00,  1.19s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:11<00:00,  1.69s/it]
              all        445        498      0.542      0.603      0.594      0.418

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 28/29      8.37G    0.02499    0.01277    0.02215         92        640: 100% 43/43 [00:51<00:00,  1.20s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.49s/it]
              all        445        498      0.558      0.596      0.611      0.444

 Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
 29/29      8.37G    0.02407    0.01203    0.02004         93        640: 100% 43/43 [00:53<00:00,  1.25s/it]
            Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:10<00:00,  1.55s/it]
              all        445        498      0.553      0.633      0.621      0.453


 30 epochs completed in 0.522 hours.
 Optimizer stripped from runs/train/exp/weights/last.pt, 14.5MB
 Optimizer stripped from runs/train/exp/weights/best.pt, 14.5MB

 Validating runs/train/exp/weights/best.pt...
 Fusing layers...
 Model summary: 157 layers, 7037095 parameters, 0 gradients, 15.8 GFLOPs
                 Class     Images  Instances          P          R      mAP50   mAP50-95: 100% 7/7 [00:11<00:00,  1.68s/it]
                   all        445        498      0.553      0.633       0.62      0.453
                  Bear        445         42      0.546      0.717      0.602      0.425
                  Bull        445         91      0.753      0.297      0.548      0.369
               Cheetah        445          5     0.0812        0.4      0.106     0.0762
             Crocodile        445         81      0.842      0.827      0.879      0.518
              Elephant        445         39      0.313      0.821      0.542      0.368
                Jaguar        445          5          0          0      0.054     0.0419
               Leopard        445         59      0.941      0.678       0.89      0.615
                  Lion        445        103      0.823      0.856      0.899      0.694
             Rhinoceros        445         46      0.615      0.913      0.893      0.768
                 Tiger        445         27      0.614      0.827      0.791      0.655
 Results saved to runs/train/exp
```

```
# Copying the best weights file from the training directory to the specified locations (optional)
%cp /content/yolov5/runs/train/exp/weights/best.pt /content/
%cp /content/yolov5/runs/train/exp/weights/best.pt "/content/drive/MyDrive/Colab Notebooks"

# Copying the 'yolo' and 'yolov5' directories to a specific location (optional)
%cp -r /content/yolo "/content/drive/MyDrive/Colab Notebooks/yolo"
%cp -r /content/yolov5 "/content/drive/MyDrive/Colab Notebooks/yolov5"

# Predict animal and give warning # Note: This code is recommended to be run on a local machine due to hardware requirements and access to files (sound file)
import cv2
import torch
import numpy as np
import tkinter as tk
import time
import pygame
class_names = ["Bear", "Bull", "Cheetah", "Crocodile", "Elephant", "Jaguar", "Leopard", "Lion", "Rhinoceros", "Tiger"]
camera = cv2.VideoCapture(0)
```

```
pop_up_shown = False
pop_up_last_time = 0
def show_alert(animal_class):
 play_alert_sound() # Play the alert sound
 root = tk.Tk()
 root.title("Animal Alert")
 alert_label = tk.Label(root, text=f"An {animal_class} has been detected!",
font=("Helvetica", 16))
 alert_label.pack(padx=20, pady=20)
 root.after(3000, root.destroy) # Close the pop-up after 3 seconds
 root.mainloop()
def play_alert_sound():
 pygame.mixer.init()
 pygame.mixer.music.load('voice/alarm1.wav') # Provide the path to your alert sound
file
 pygame.mixer.music.play()
def detect_objects(camera, class_names, confidence_threshold, model_path):
 global pop_up_shown, pop_up_last_time # Declare pop_up_shown and pop_up_last_time as
global variables
 model = torch.hub.load('ultralytics/yolov5', 'custom', path=model_path)
 model.conf = confidence_threshold
 while True:
  ret, frame = camera.read()
  with torch.no_grad():
   results = model(frame)
  predictions = results.pandas().xyxy[0]
  predictions = predictions[predictions['confidence'] >= confidence_threshold]
  labels = predictions['class'].astype(int).tolist()
  boxes = predictions[['xmin', 'ymin', 'xmax', 'ymax']].values.tolist()
  for label, box in zip(labels, boxes):
   if len(box) != 4:
    print(f"Invalid box: {box}")
    continue
   x_min, y_min, x_max, y_max = map(int, box)
   cv2.rectangle(frame, (x_min, y_min), (x_max, y_max), (0, 255, 0), 2
   cv2.putText(frame, class_names[label], (x_min, y_min - 10),
cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0, 255, 0), 2)
   if not pop_up_shown or time.time() - pop_up_last_time >= 0.5:
    animal_class = class_names[label]
    show_alert(animal_class)
    pop_up_shown = True
    pop_up_last_time = time.time()
  cv2.imshow('frame', frame)
  if cv2.waitKey(1) & 0xFF == ord('q'):
   break
 camera.release()
 cv2.destroyAllWindows()
# Start the initial detection process detect_objects(camera, class_names,
confidence_threshold=0.5, model_path='best.pt')
```

FUTURE ENHANCEMENTS

Mobile Application: Develop a mobile application for the Animal Identification and Alerting System to provide users with a convenient and user-friendly interface. The mobile app can enable users to receive alerts, track animal sightings, and access their profiles on the go.

Geolocation Integration: Integrate geolocation services to enhance the system's functionality. This would allow users to track their own location and the location of identified animals more accurately. It can also enable geofencing capabilities for setting up virtual boundaries and triggering alerts when animals enter or leave specific areas.

Image Recognition Improvements: Invest in research and development to improve the accuracy and efficiency of the animal identification process. Explore advanced image recognition and machine learning techniques to enhance the system's ability to identify animals from images and minimize false positives or false negatives.

Real-time Data Updates: Implement real-time data updates to ensure that the system's information, such as animal sightings and alerts, is promptly reflected and available to users. This can involve the use of technologies like WebSockets or server-sent events to enable real-time communication between the server and client applications.

Social Media Integration: Allow users to share animal sightings, alerts, and system updates on popular social media platforms. Integration with social media APIs can enable users to post pictures, descriptions, and locations of animals they encounter, raising awareness and facilitating community engagement.

Data Analytics and Reporting: Implement data analytics capabilities to generate insights and reports from the collected animal identification and alerting data. This can include generating statistics on animal population trends, hotspots of animal sightings, and patterns of animal behavior. Such analytics can help in conservation efforts and decision-making.

User Feedback and Rating System: Introduce a feedback and rating system to gather user feedback on animal sightings, alerts, and the overall system experience. This can provide valuable insights for system improvements and enhancements while engaging users in contributing to the system's accuracy and effectiveness.

Integration with External Systems: Explore integrations with external systems and databases, such as wildlife databases or environmental monitoring platforms, to enrich the animal identification and alerting system with additional data sources and enhance its capabilities.

Multi-language Support: Incorporate multi-language support to cater to users from diverse regions and enable them to use the system in their preferred language. This can involve implementing language localization and translation features.

Collaborative Features: Enable collaboration among users by allowing them to form groups, share information, and contribute to collective efforts in animal identification and conservation. This can include features like group chat, shared sighting maps, and collaborative identification challenges.

REFERENCES

International Union for Conservation of Nature (IUCN). (2021). Red List of Threatened Species. Retrieved from https://www.iucnredlist.org/

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). (n.d.). Retrieved from https://www.cites.org/

Animal Detection and Tracking in the Wild: Challenges and Approaches" by R. Medvidovic, S. Dobrevski, and A. Nasiopoulos. (Link: https://ieeexplore.ieee.org/abstract/document/8791083)

Wildlife Conservation Society: https://www.wcs.org/

National Geographic Society: https://www.nationalgeographic.org/

Wildlife Conservation Network: https://wildnet.org/