# Malaria Image Classification Code

import os  
import zipfile  
import tensorflow as tf  
from tensorflow.keras import layers, models  
from sklearn.metrics import classification\_report  
import matplotlib.pyplot as plt  
# ===========================  
# 1. Extract Dataset  
# ===========================  
zip\_path = "malaria Dataset.zip" # Make sure this file exists  
extract\_dir = "malaria\_dataset"  
  
if not os.path.exists(extract\_dir):  
 with zipfile.ZipFile(zip\_path, 'r') as zip\_ref:  
 zip\_ref.extractall(extract\_dir)  
 print("Dataset extracted!")  
else:  
 print("Dataset already extracted.")  
  
# ===========================  
# 2. Dataset Paths  
# ===========================  
data\_dir = os.path.join(extract\_dir, "cell\_images") # Expected: malaria\_dataset/cell\_images  
if not os.path.isdir(data\_dir):  
 raise FileNotFoundError(f"Expected 'cell\_images' folder inside {extract\_dir}")  
  
# ===========================  
# 3. Data Preprocessing  
# ===========================  
IMG\_SIZE = (64, 64)  
BATCH\_SIZE = 32  
  
train\_ds = tf.keras.utils.image\_dataset\_from\_directory(  
 data\_dir,  
 image\_size=IMG\_SIZE,  
 batch\_size=BATCH\_SIZE,  
 validation\_split=0.2,  
 subset="training",  
 seed=42  
)  
  
val\_ds = tf.keras.utils.image\_dataset\_from\_directory(  
 data\_dir,  
 image\_size=IMG\_SIZE,  
 batch\_size=BATCH\_SIZE,  
 validation\_split=0.2,  
 subset="validation",  
 seed=42  
)  
  
class\_names = train\_ds.class\_names # ['Parasitized', 'Uninfected']  
print("Classes:", class\_names)  
  
# Performance improvements  
AUTOTUNE = tf.da