

```
%pip install ultralytics
```



```
Collecting ultralytics
```

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  Downloading ultralytics-8.3.162-py3-none-any.whl.metadata (37 kB)
Requirement already satisfied: numpy>=1.23.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics)
Requirement already satisfied: matplotlib>=3.3.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics)
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```

```
from google.colab import drive
```

```
# Montar Google Drive
print("Montando Google Drive...")
drive.mount('/content/drive')
print("Google Drive montado.")
```

➔ Montando Google Drive...  
 Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive")  
 Google Drive montado.

```
# Instalar/Actualizar Ultralytics
print("\nInstalando/Actualizando Ultralytics a la última versión para soporte YOLOv11...")
%pip install -U ultralytics
print("Ultralytics instalado/actualizado.")
```

➔ Instalando/Actualizando Ultralytics a la última versión para soporte YOLOv11...

Requirement already satisfied: ultralytics in /usr/local/lib/python3.11/dist-packages (8.3.162)  
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 Ultralytics instalado/actualizado.

```
from google.colab import drive
import os
import torch
```

```

import sys
import time
from ultralytics import YOLO

# Verificar disponibilidad de GPU
print("\nVerificando disponibilidad de GPU...")
device_to_use = "0" if torch.cuda.is_available() else "cpu"
print(f"Usando dispositivo: {device_to_use}")

# Definir rutas del dataset y modelo
data_yaml_path = "/content/drive/MyDrive/Colab Notebooks/LSECNuYoloII/dataset/data - colab.yaml"
project_directory = "/content/drive/MyDrive/Colab Notebooks/LSECNuYoloII/runs"
run_name = "yolo10_adam"

# Lista de modelos a intentar en orden de preferencia
initial_model_preferences = ['yolov11s.pt', 'yolov10s.pt']
checkpoint_path = os.path.join(project_directory, "detect", run_name, "weights", "last.pt")

# Cargar modelo con lógica de prioridades
print(f"\nBuscando modelo entre: {initial_model_preferences}")
model = None

if os.path.exists(checkpoint_path):
    print(f"Cargando desde checkpoint: {checkpoint_path}")
    try:
        model = YOLO(checkpoint_path)
    except Exception as e:
        print(f"Error al cargar checkpoint: {e}")

if model is None:
    for preferred_model in initial_model_preferences:
        try:
            model = YOLO(preferred_model)
            print(f"Modelo {preferred_model} cargado exitosamente.")
            break
        except Exception as e:
            print(f"Error al cargar {preferred_model}: {e}")

if model is None:
    print("Error crítico: No se pudo cargar ningún modelo.")
    exit()

# Definir hiperparámetros
optimizer = "adam" #"sgd"
lr0 = 0.005
lrf = 0.1
momentum = 0.937

# Imprimir el modelo que se va a usar
print(f"\nEl modelo que se usará para el entrenamiento es: {model}")

# Entrenar el modelo
print("\nIniciando entrenamiento del modelo...")
results = model.train(data=data_yaml_path, epochs=100, optimizer=optimizer, lr0=lr0, lrf=lrf, momentum=momentum)

print("\nEntrenamiento completado! Resultados guardados en:")
print(os.path.join(project_directory, "detect", run_name))

```



Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
96/100	3.16G	0.9429	0.8345	1.79	6	640: 100% ██████████  46/46 [
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ██████████
Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
97/100	3.16G	0.9365	0.8037	1.787	6	640: 100% ██████████  46/46 [
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ██████████
Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
98/100	3.16G	0.9245	0.8029	1.804	6	640: 100% ██████████  46/46 [
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ██████████
Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
99/100	3.16G	0.9497	0.8468	1.809	6	640: 100% ██████████  46/46 [
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ██████████
Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
100/100	3.19G	0.9295	0.7899	1.822	6	640: 100% ██████████  46/46 [
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ██████████

100 epochs completed in 0.347 hours.

Optimizer stripped from runs/detect/yolo10\_adam/weights/last.pt, 16.5MB

Optimizer stripped from runs/detect/yolo10\_adam/weights/best.pt, 16.5MB

Validating runs/detect/yolo10\_adam/weights/best.pt...

Ultralytics 8.3.162 🚀 Python-3.11.13 torch-2.6.0+cu124 CUDA:0 (Tesla T4, 15095MiB)

YOLOv10s summary (fused): 106 layers, 7,222,257 parameters, 0 gradients, 21.4 GFLOPs

Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100% ██████████
all	99	99	0.913	0.841	0.912	0.794
clase0	12	12	0.845	0.457	0.647	0.373
clase1	7	7	0.868	0.944	0.943	0.735
clase2	10	10	0.98	0.8	0.962	0.865
clase3	15	15	1	0.678	0.92	0.871
clase4	11	11	0.986	1	0.995	0.928
clase5	7	7	0.972	1	0.995	0.885
clase6	9	9	0.886	0.862	0.902	0.83
clase7	3	3	0.886	1	0.995	0.995
clase8	9	9	1	0.622	0.863	0.817
clase9	7	7	0.752	1	0.933	0.877
clase10	9	9	0.864	0.889	0.882	0.554

Speed: 0.5ms preprocess, 5.4ms inference, 0.0ms loss, 0.6ms postprocess per image

Results saved to runs/detect/yolo10\_adam

Entrenamiento completado! Resultados guardados en:

/content/drive/MvDrive/Colab Notebooks/LSECNuYoloII/runs/detect/volo10 adam

