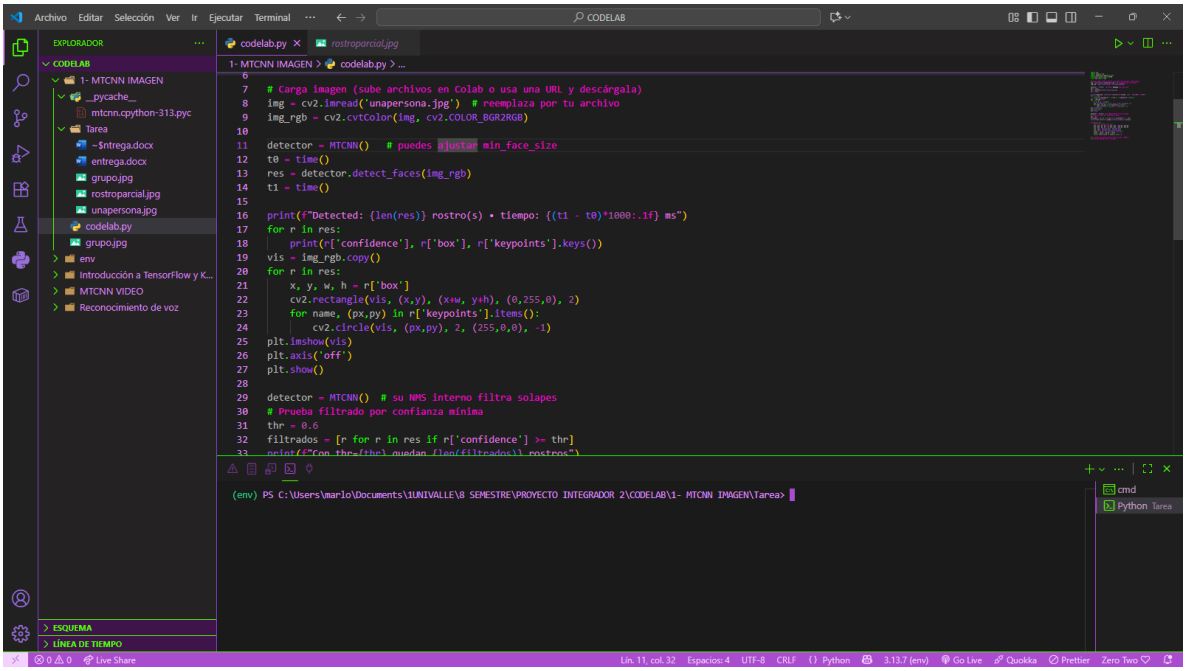
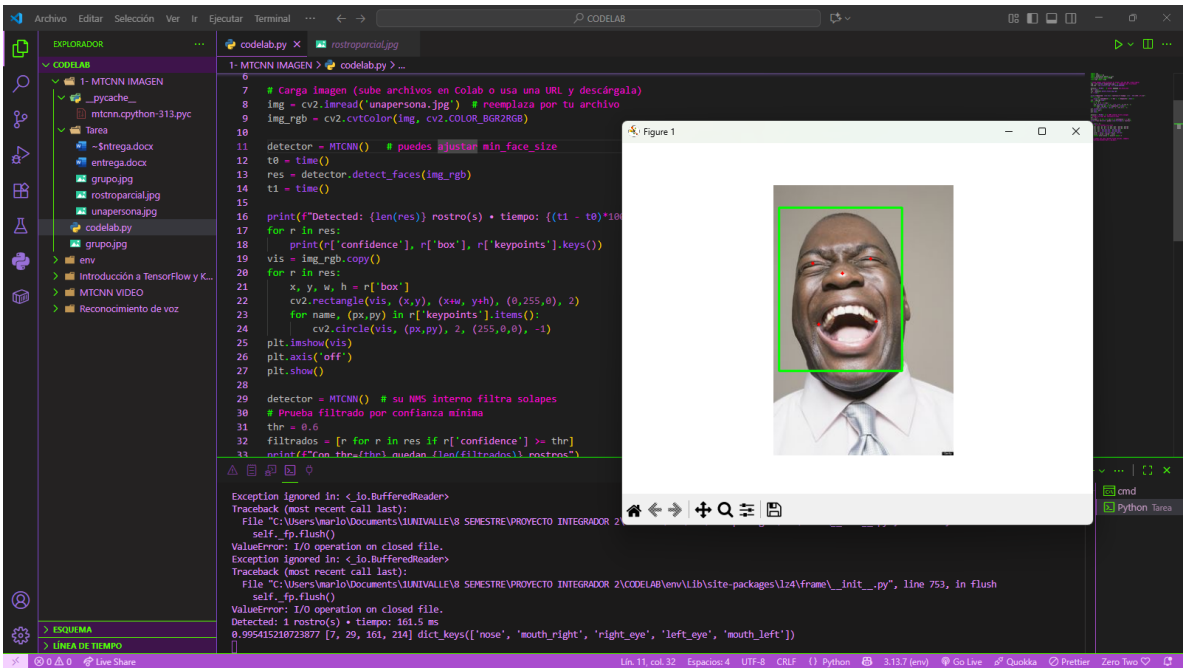
1- Ejecuta detección en 3 imágenes (1 persona, grupo, rostros parciales).

Ejecución para una persona

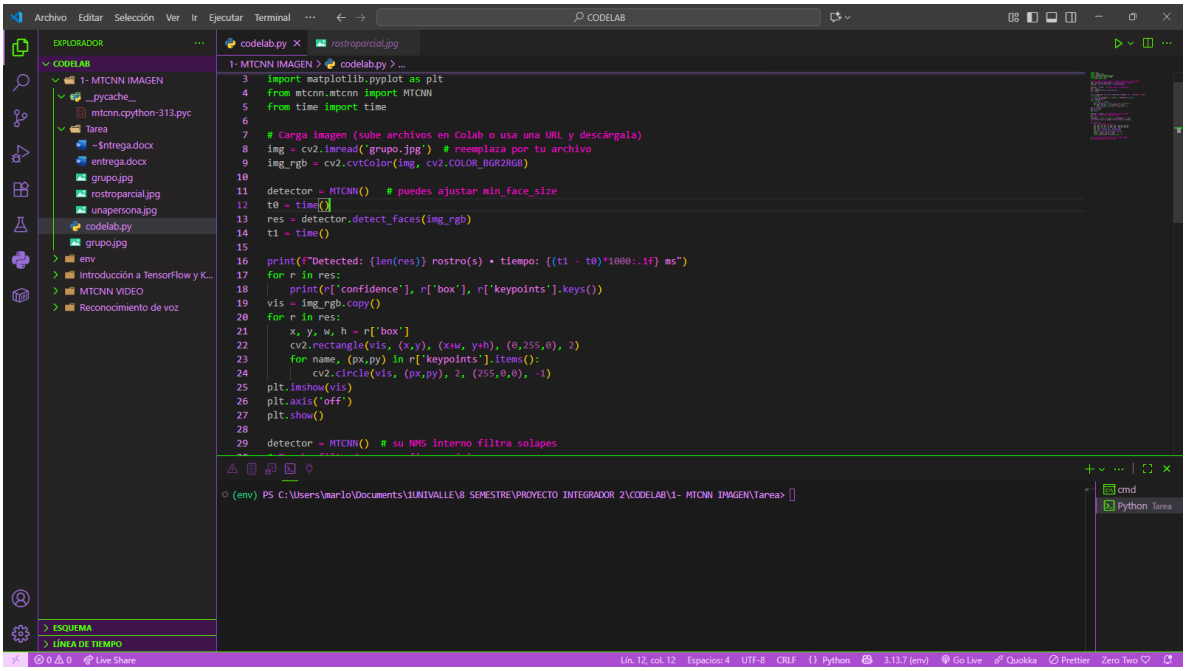


El rostro fue reconocido correctamente

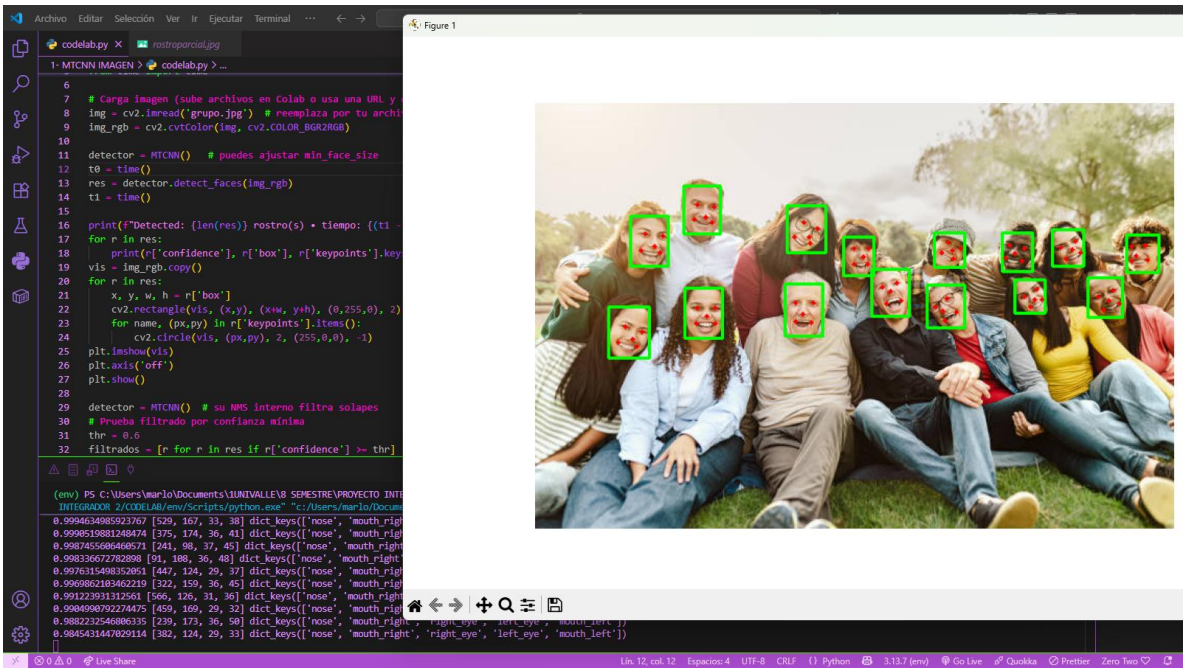


En un tiempo de 161ms

Ejecución para un grupo

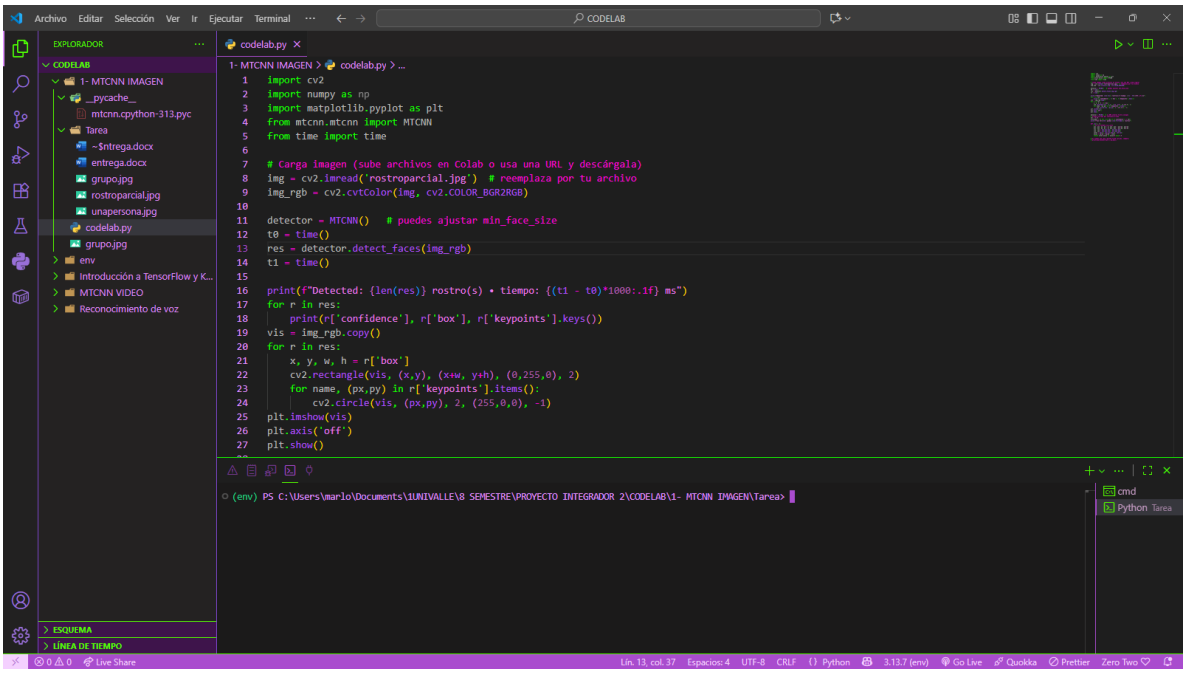


Los rostros fueron reconocidos correctamente con cierta precisión en cuestión de ojos y nariz

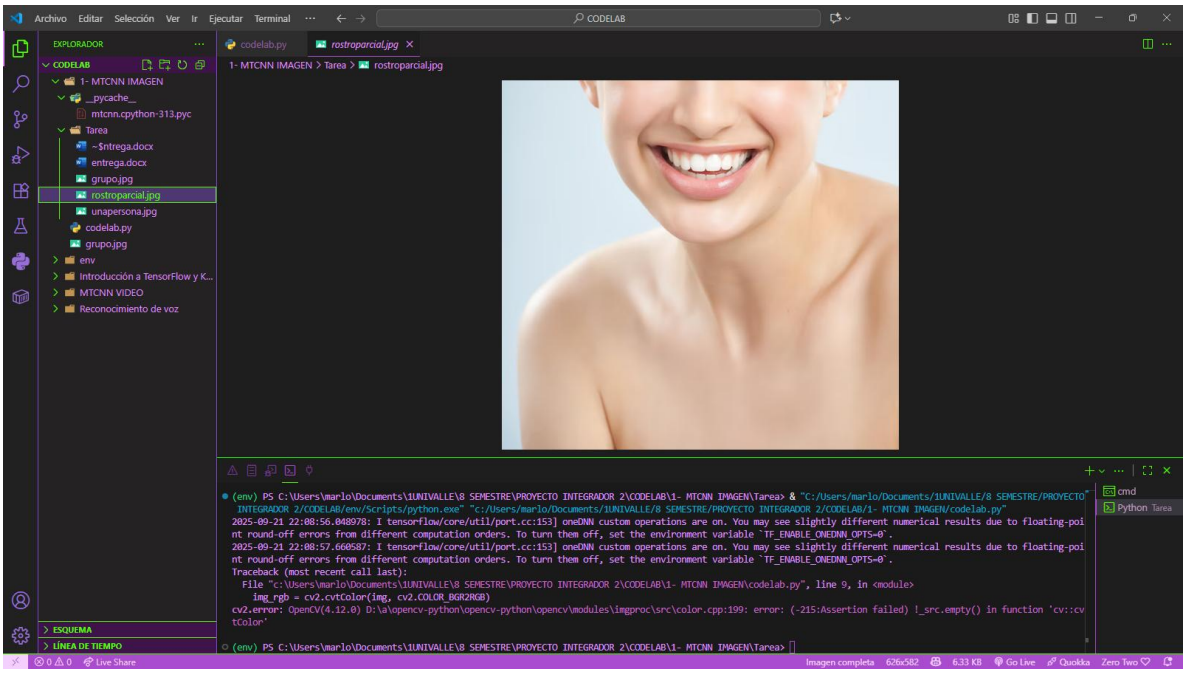


Se detectaron los 15 rostros en un tiempo de 225ms

Ejecución para un rostro parcial

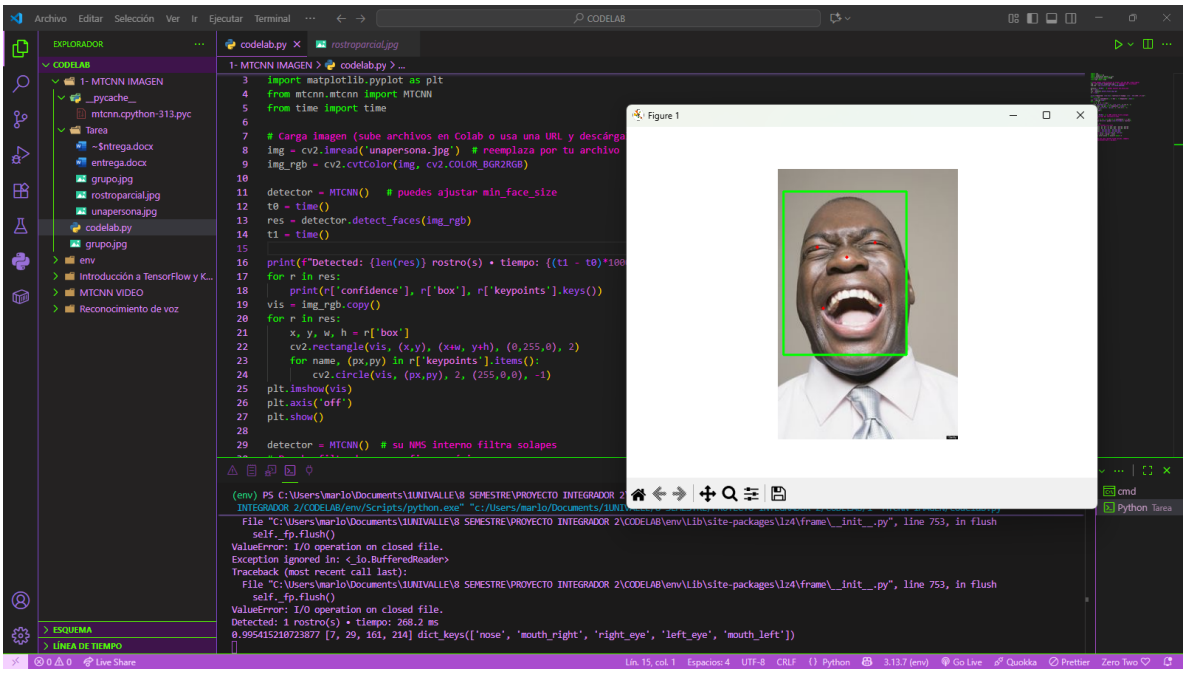


No pudo reconocer el rostro parcial



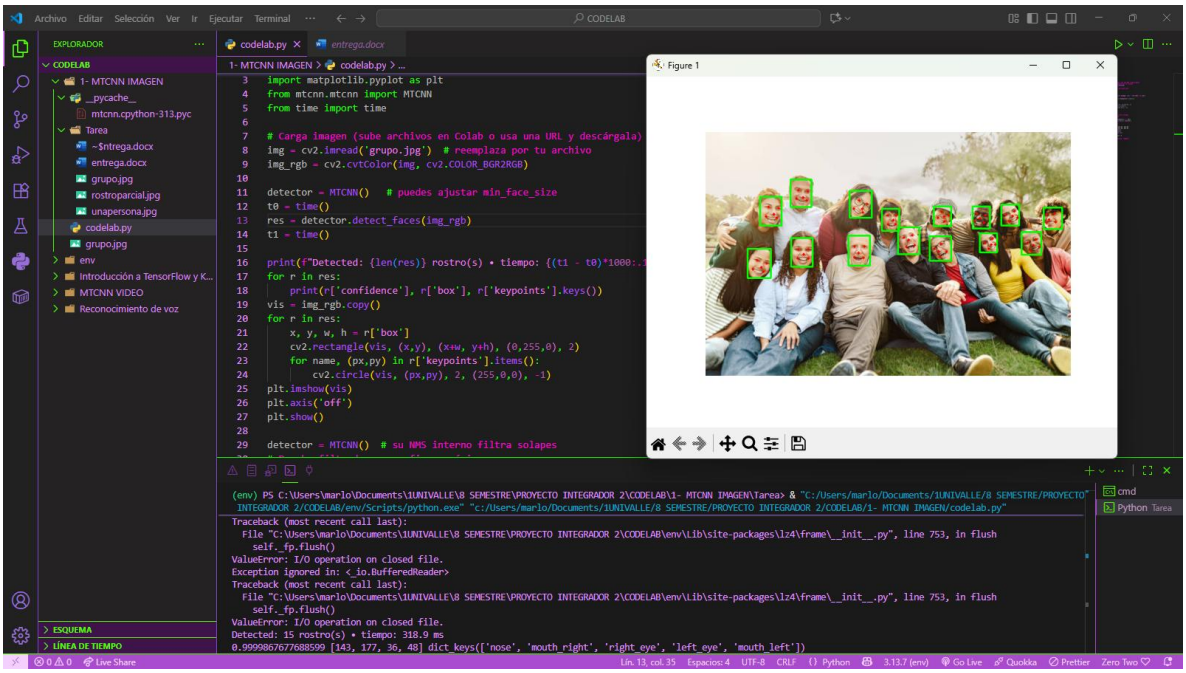
2- Ajusta el umbral de confianza (0.6 → 0.95) y reporta cuántos rostros quedan.

Ajuste para la imagen de una persona



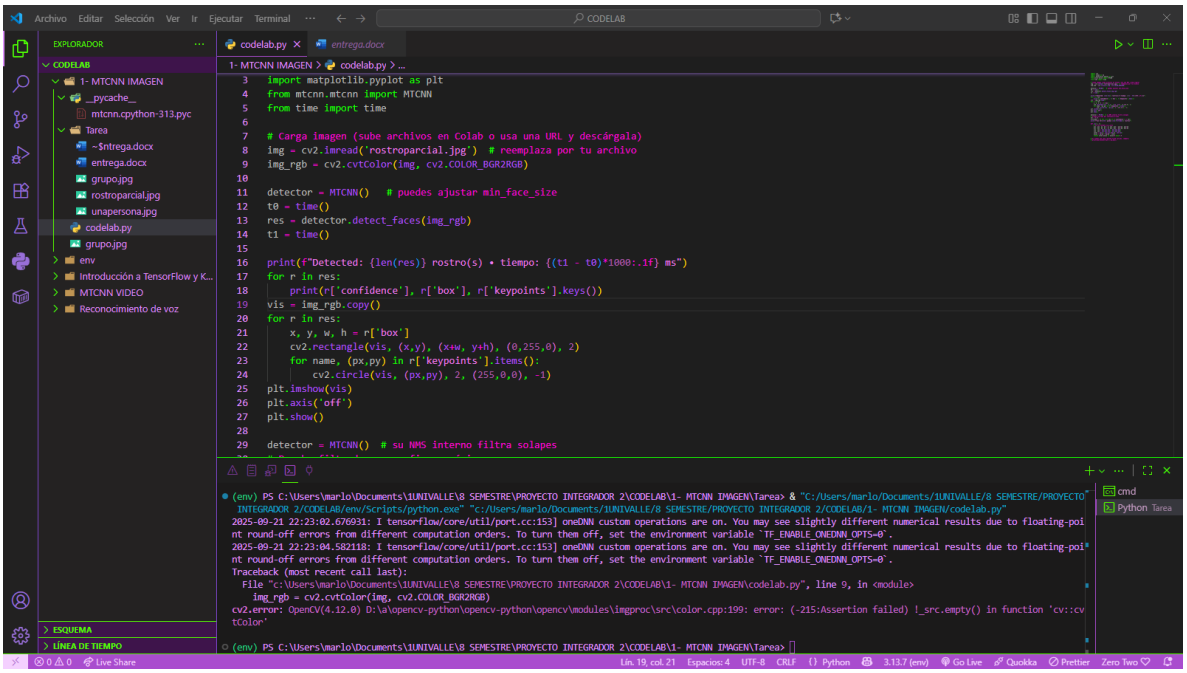
Se reconoció perfectamente el rostro en un tiempo de 268ms

Ajuste para la imagen del grupo



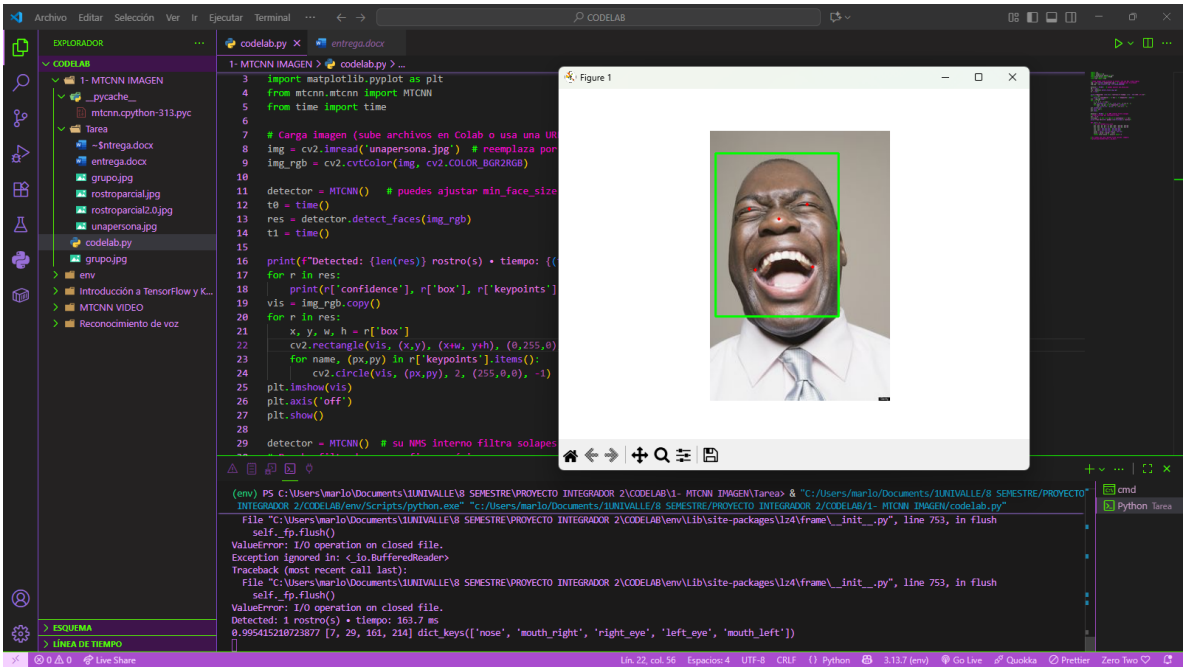
Se reconocieron los 15 rostros en un tiempo de 318ms

Para el rostro parcial sigue sin detectarlo



3- Mide tiempo de inferencia por imagen (promedia 5 corridas).

Una Persona



163ms

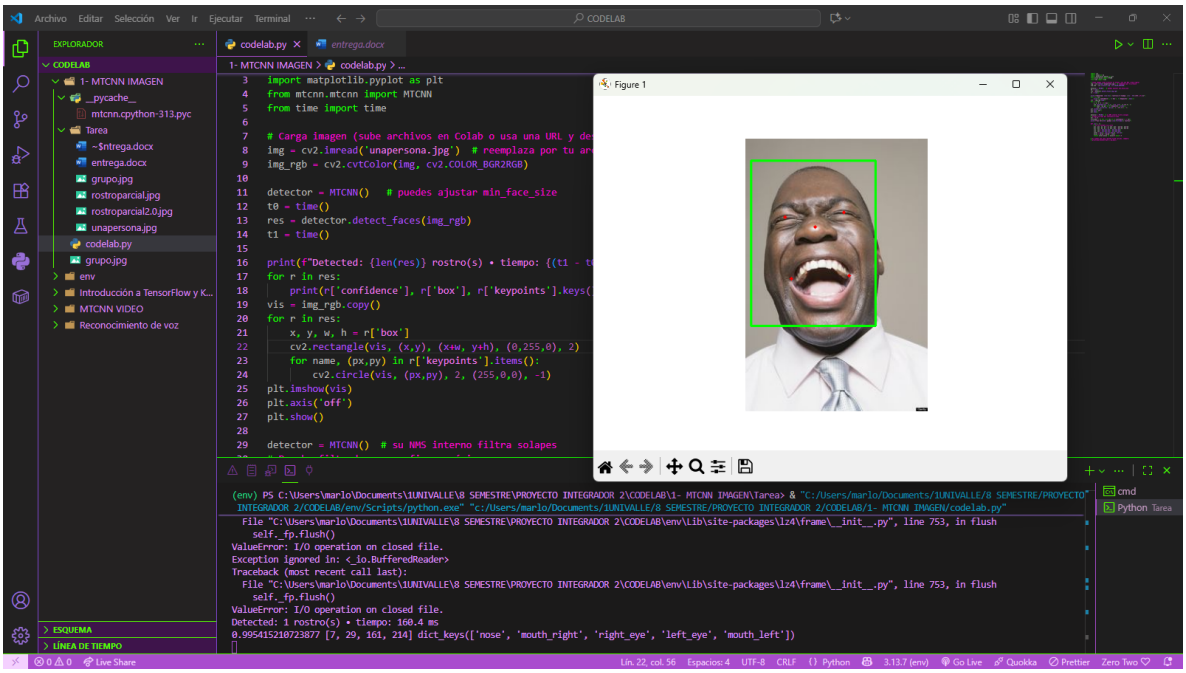


Figure 1
import matplotlib.pyplot as plt
from mtcnn.mtcnn import MTCNN
from time import time
# Carga imagen (sube archivos en Colab o usa una URL y de
img = cv2.imread('unapersona.jpg') # reemplaza por tu ar
img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
detector = MTCNN() # puedes ajustar min_face_size
t0 = time()
res = detector.detect_faces(img_rgb)
t1 = time()
print(f"Detected: {len(res)} rostro(s) • tiempo: {(t1 - t
for r in res:
print(r['confidence'], r['box'], r['keypoints'].keys(
vis = img_rgb.copy()
for r in res:
x, y, w, h = r['box']
cv2.rectangle(vis, (x,y), (x+w, y+h), (0,255,0), 2)
for name, (px,py) in r['keypoints'].items():
cv2.circle(vis, (px,py), 2, (255,0,0), -1)
plt.imshow(vis)
plt.axis('off')
plt.show()
detector = MTCNN() # su NMS interno filtra solapes
(env) PS C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\1- MTCNN IMAGEN\Tarea> & "C:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/env/Scripts/python.exe" "c:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/1- MTCNN IMAGEN/codelab.py"
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 160.4 ms
0.995415210723877 [7, 29, 161, 214] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

160ms

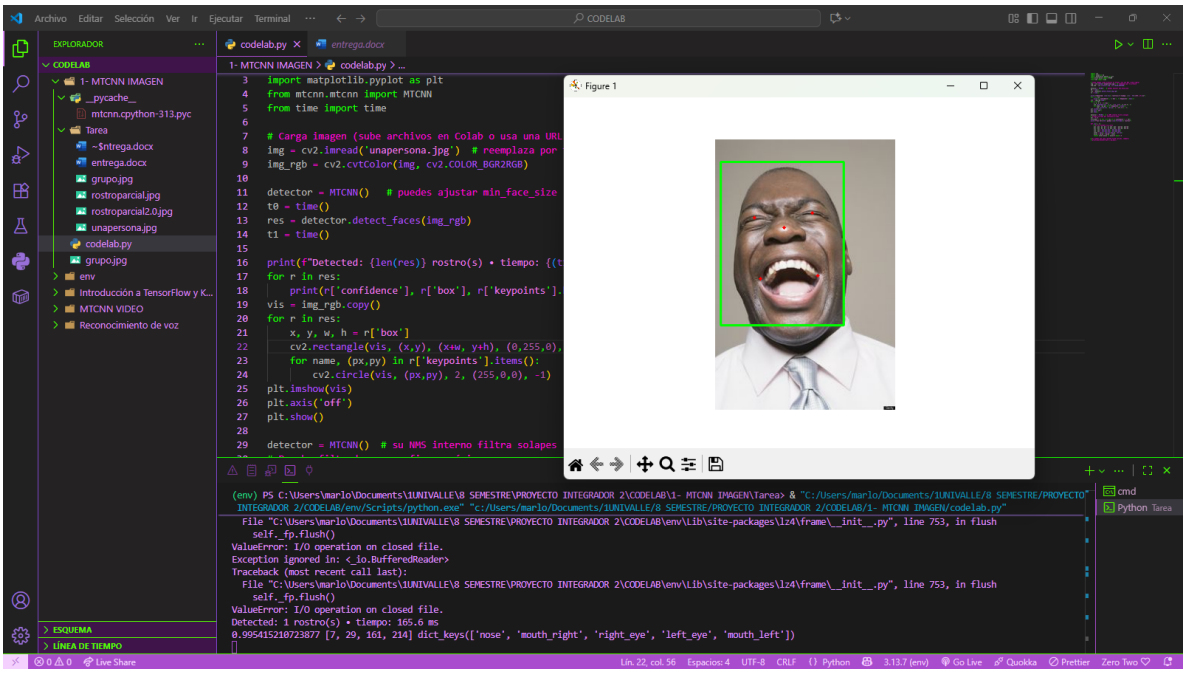
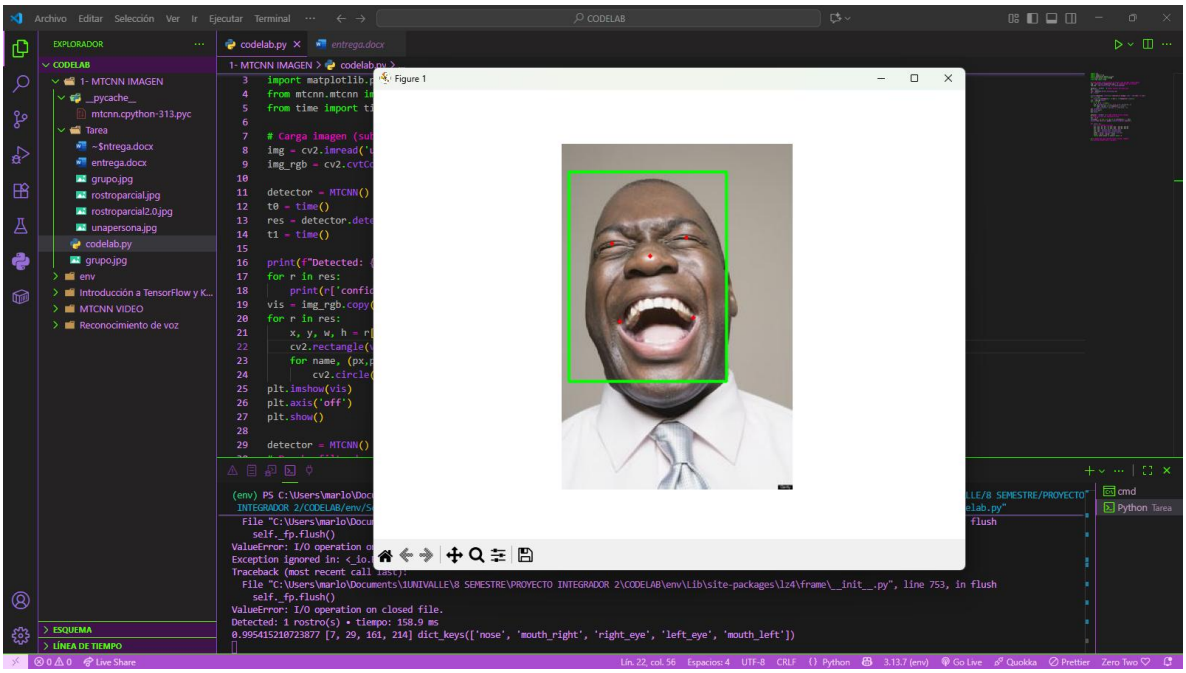
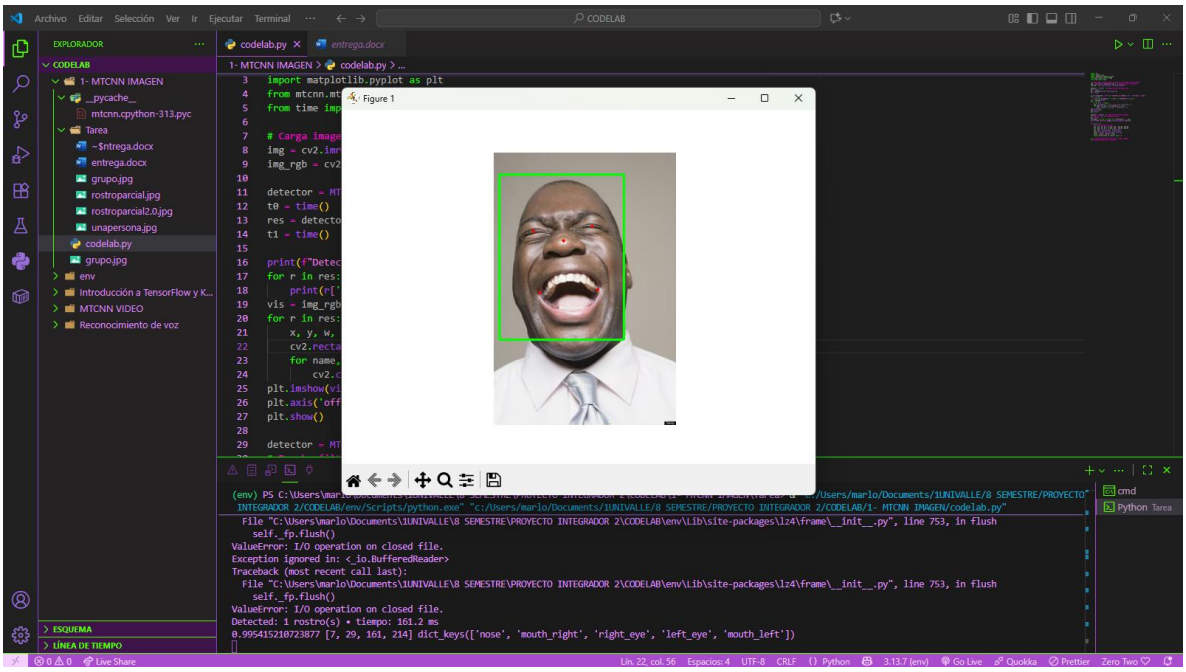


Figure 1
import matplotlib.pyplot as plt
from mtcnn.mtcnn import MTCNN
from time import time
# Carga imagen (sube archivos en Colab o usa una URL
img = cv2.imread('unapersona.jpg') # reemplaza por
img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
detector = MTCNN() # puedes ajustar min_face_size
t0 = time()
res = detector.detect_faces(img_rgb)
t1 = time()
print(f"Detected: {len(res)} rostro(s) • tiempo: {(t
for r in res:
print(r['confidence'], r['box'], r['keypoints'].
vis = img_rgb.copy()
for r in res:
x, y, w, h = r['box']
cv2.rectangle(vis, (x,y), (x+w, y+h), (0,255,0),
for name, (px,py) in r['keypoints'].items():
cv2.circle(vis, (px,py), 2, (255,0,0), -1)
plt.imshow(vis)
plt.axis('off')
plt.show()
detector = MTCNN() # su NMS interno filtra solapes
(env) PS C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\1- MTCNN IMAGEN\Tarea> & "C:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/env/Scripts/python.exe" "c:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/1- MTCNN IMAGEN/codelab.py"
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 165.6 ms
0.995415210723877 [7, 29, 161, 214] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

165ms



158ms



161ms

El promedio es de 161ms

Promedio de imagen de grupo

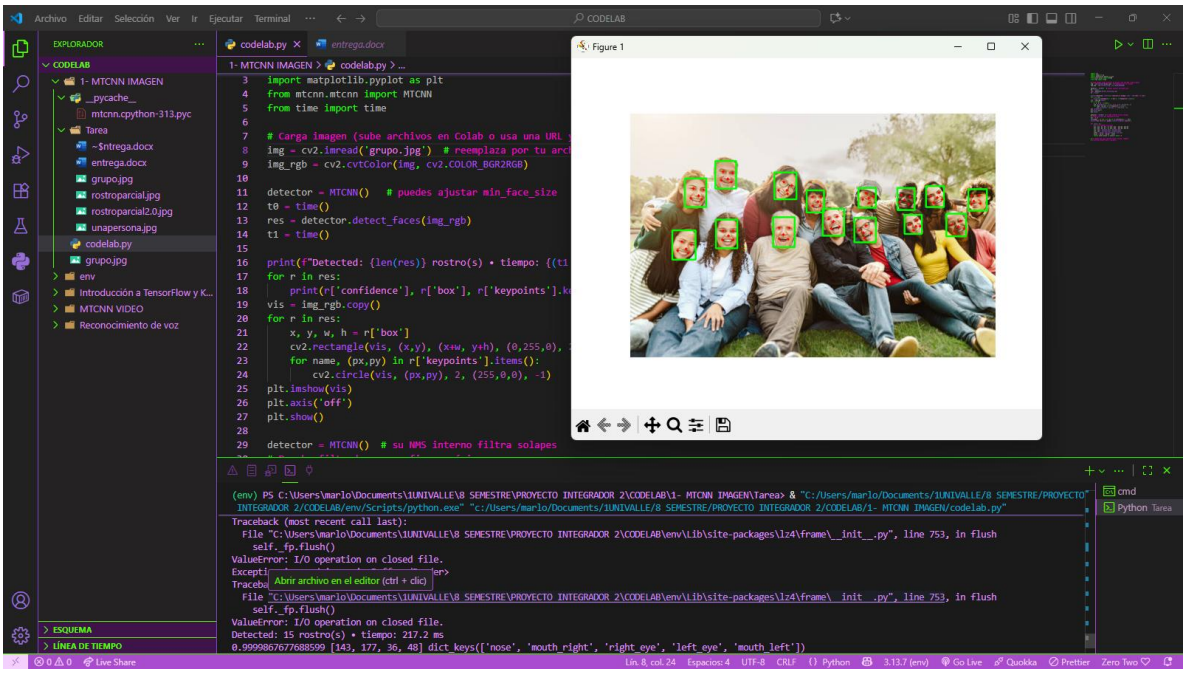


Figure 1
(env) PS C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\1- MTCNN IMAGEN\Tarea> & "C:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/env/Scripts/python.exe" "c:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/1- MTCNN IMAGEN/codelab.py"
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Abrir archivo en el editor (ctrl + clic)
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 15 rostro(s) • tiempo: 217.2 ms
0.9999867677688599 [143, 177, 36, 48] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

217ms

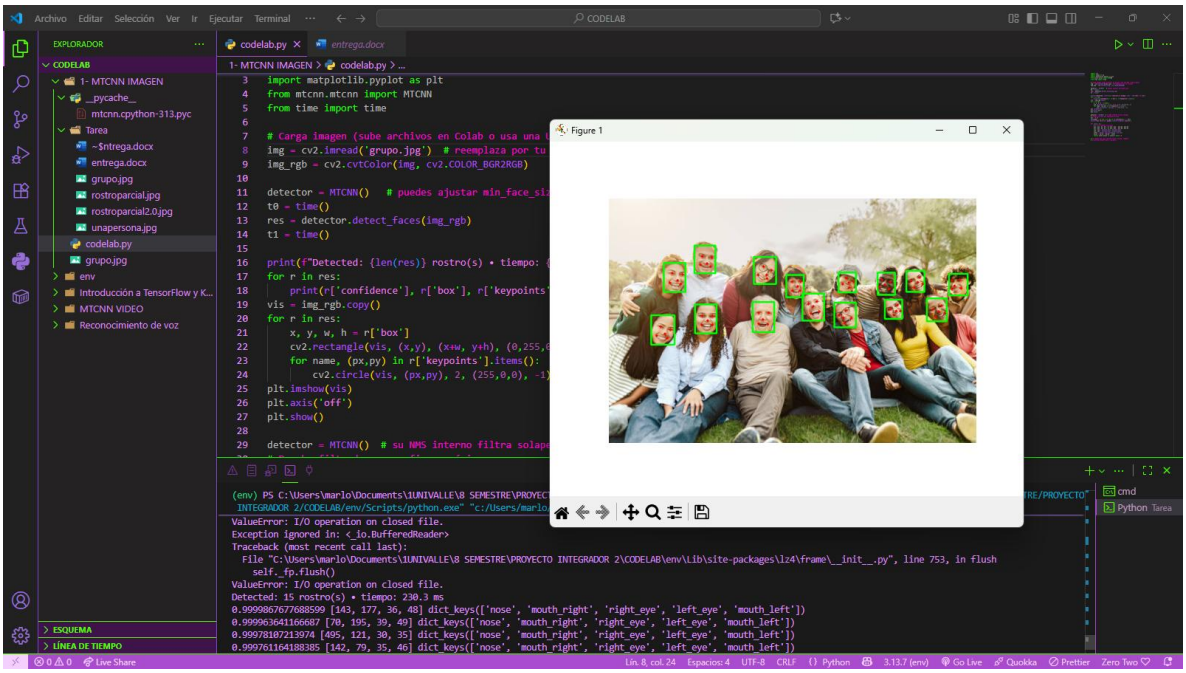


Figure 1
(env) PS C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Scripts\python.exe" "c:/Users/marlo
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 15 rostro(s) • tiempo: 230.3 ms
0.9999867677688599 [143, 177, 36, 48] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])
0.9999636411666687 [70, 195, 39, 49] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])
0.9997810721397 4 [495, 121, 30, 35] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])
0.9997611641883 85 [142, 79, 35, 46] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

230ms

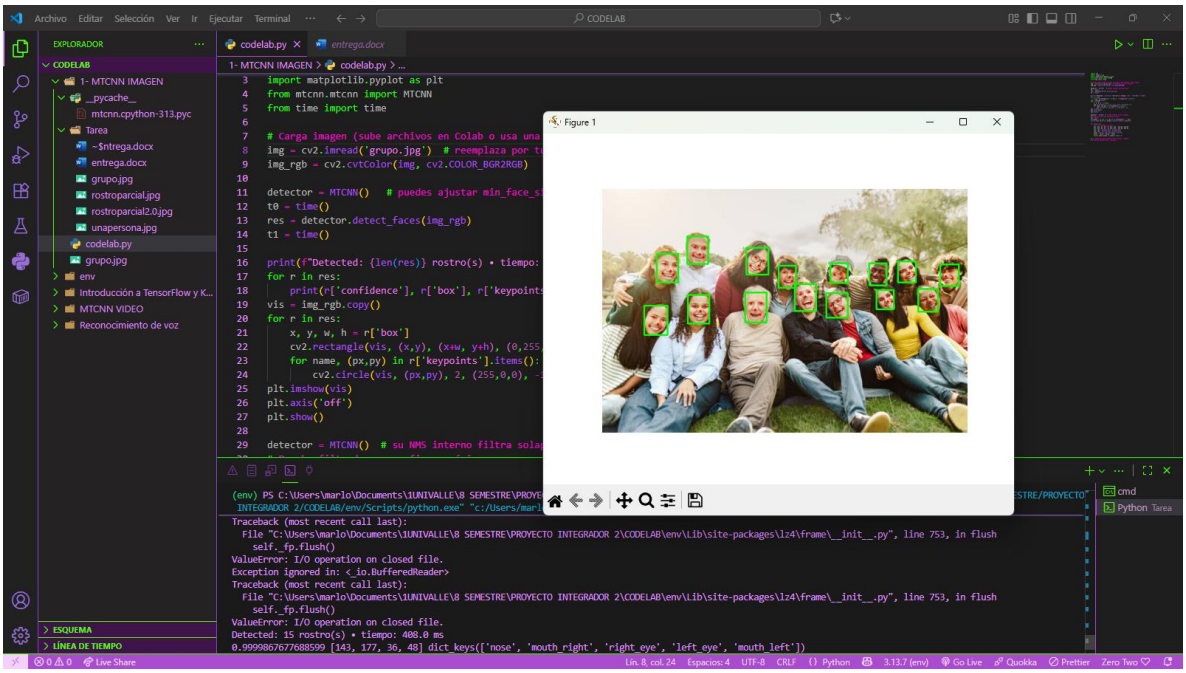


Figure 1
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 15 rostro(s) • tiempo: 408.0 ms
0.9999867677688599 [143, 177, 36, 48] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

408ms

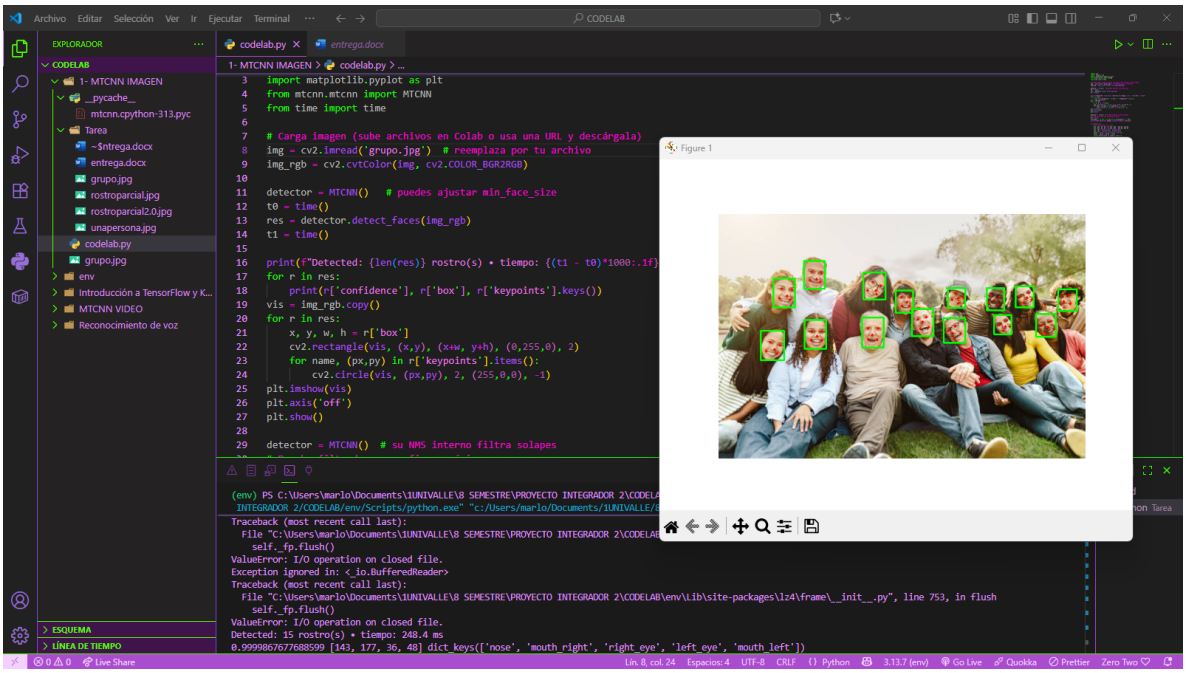
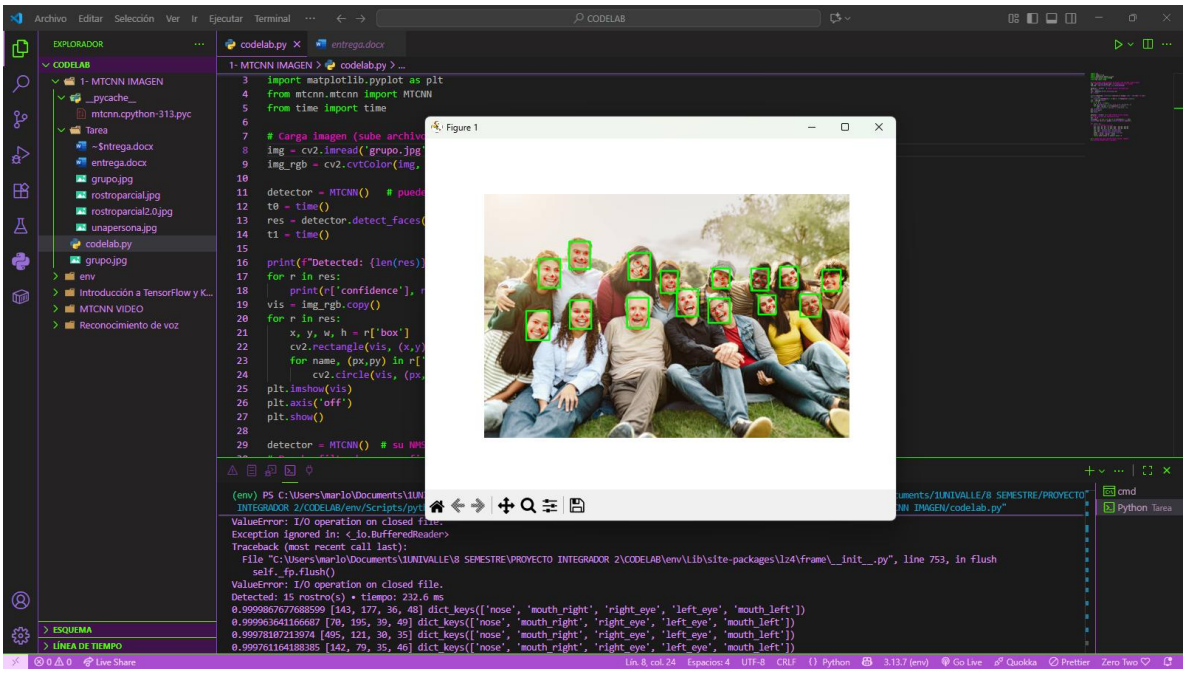


Figure 1
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 15 rostro(s) • tiempo: 248.4 ms
0.9999867677688599 [143, 177, 36, 48] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

248ms



232ms

El promedio de la imagen grupos es de 267ms

(Por cuestiones de practicidad y de completar la actividad se agregó una imagen que se asemeja a un rostro parcial por la cercanía de la imagen pero se reconoce sus ojos, boca y nariz)

Promedio rostro parcial

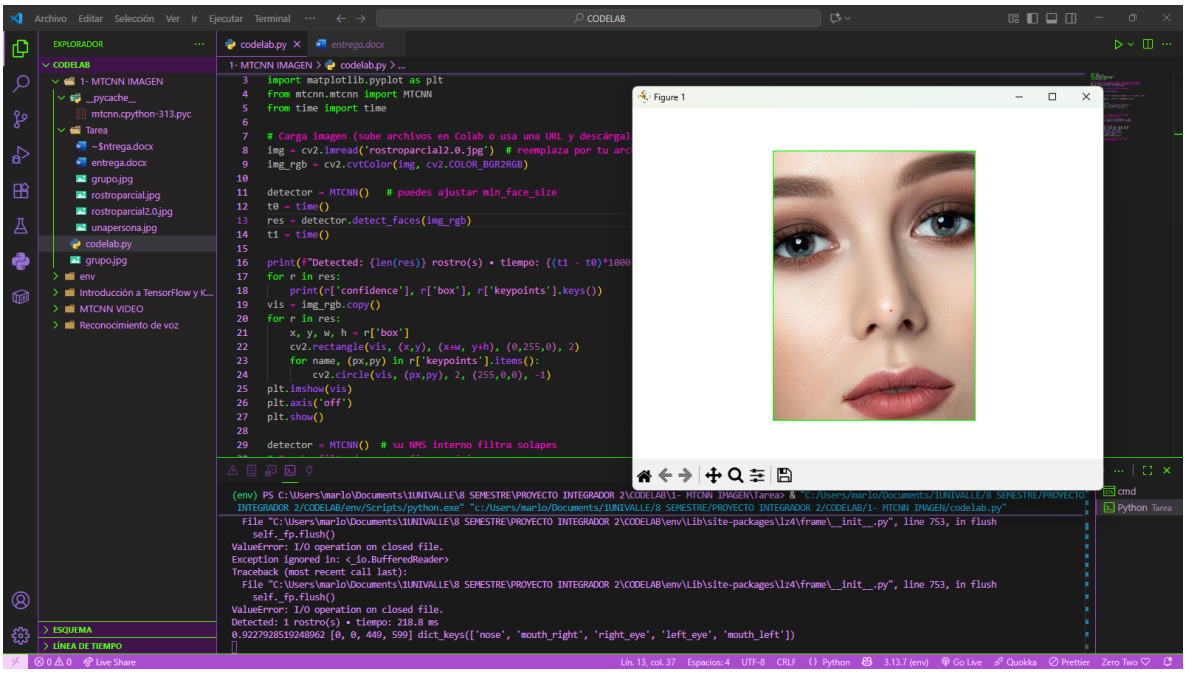


Figure 1
(env) PS C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\1- MTCNN IMAGEN\Tarea> & "C:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/env/Scripts/python.exe" "c:/Users/marlo/Documents/1UNIVALLE/8 SEMESTRE/PROYECTO INTEGRADOR 2/CODELAB/1- MTCNN IMAGEN/codelab.py"
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 218.8 ms
0.9227928519248962 [0, 0, 449, 599] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

218ms

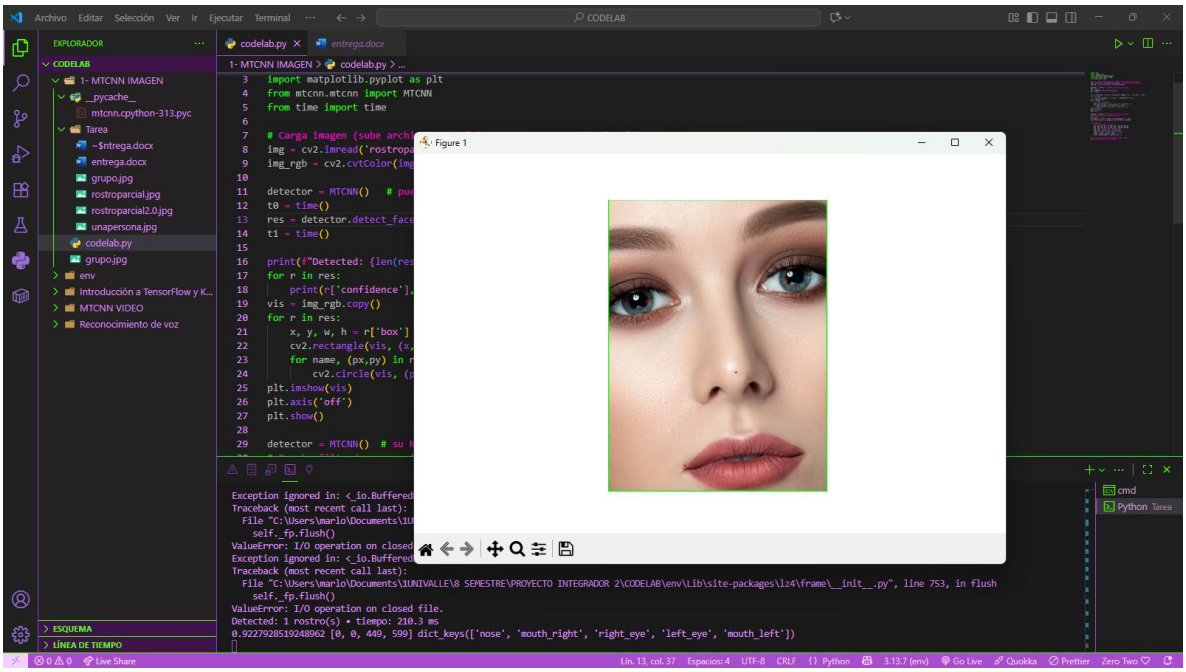


Figure 1
Exception ignored in: <_io.Buffered
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1U
self._fp.flush()
ValueError: I/O operation on closed
Exception ignored in: <_io.Buffered
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 210.3 ms
0.9227928519248962 [0, 0, 449, 599] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

210ms

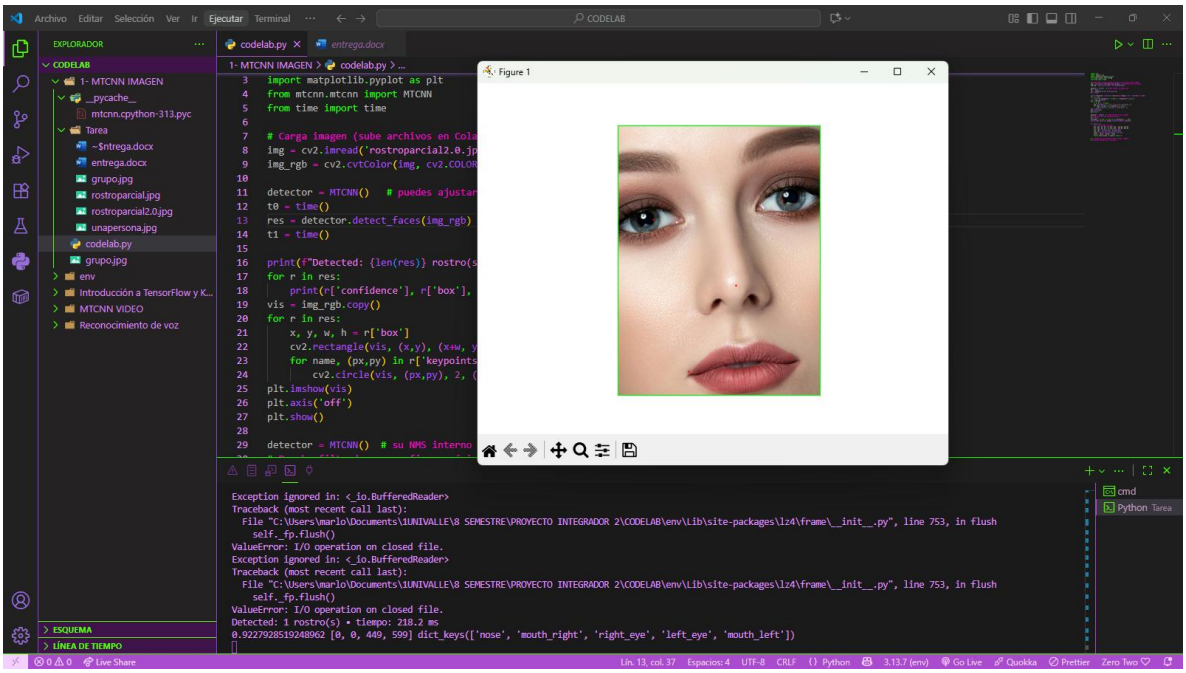


Figure 1
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 218.2 ms
0.9227928519248962 [0, 0, 449, 599] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

218ms

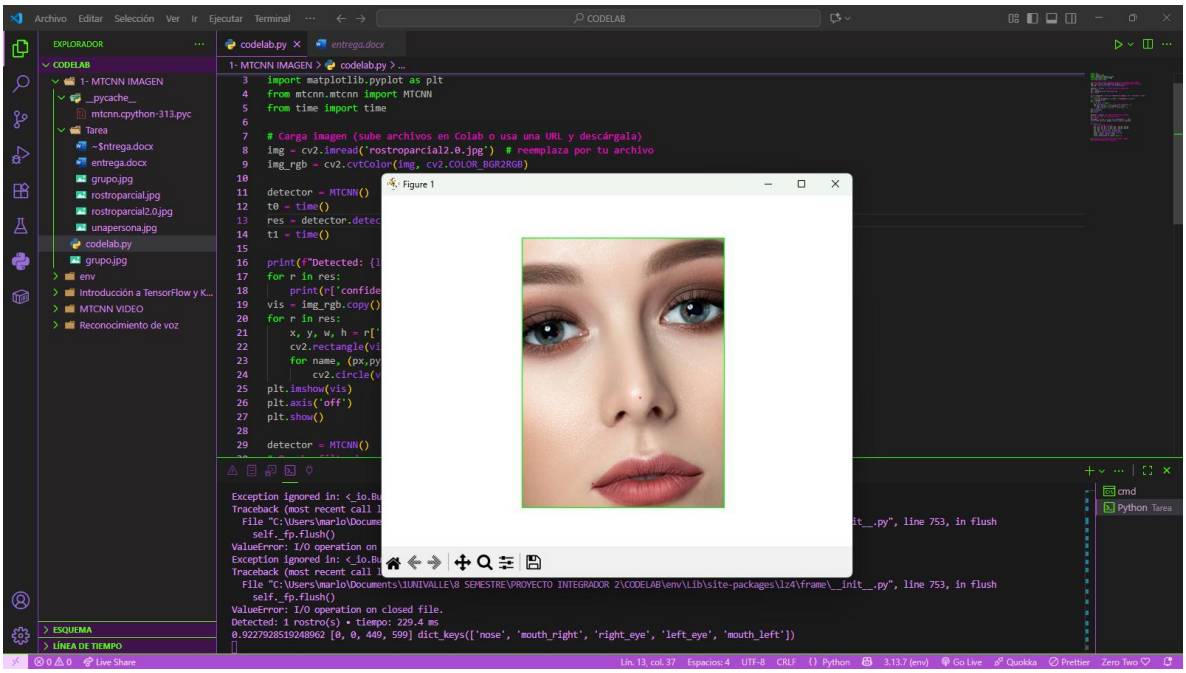
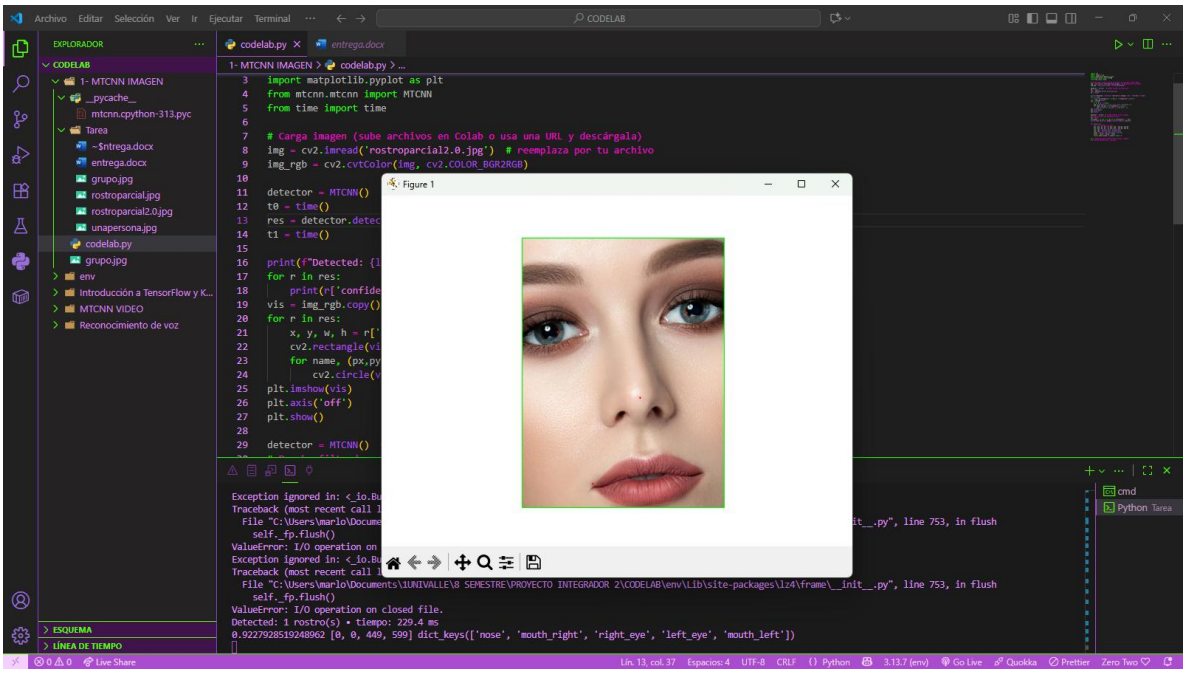


Figure 1
Exception ignored in: <_io.BufferedReader>
Traceback (most recent call last):
File "C:\Users\marlo\Documents\1UNIVALLE\8 SEMESTRE\PROYECTO INTEGRADOR 2\CODELAB\env\Lib\site-packages\lz4\frame__init__.py", line 753, in flush
self._fp.flush()
ValueError: I/O operation on closed file.
Detected: 1 rostro(s) • tiempo: 229.4 ms
0.9227928519248962 [0, 0, 449, 599] dict_keys(['nose', 'mouth_right', 'right_eye', 'left_eye', 'mouth_left'])

229ms



218ms

El promedio es de 218ms

4- Dibuja landmarks (ojos, nariz, boca) y explica un uso de alignment.

Las imágenes anteriores todas se manejaron con landmarks

El uso de alignment sirve para normalizar los rostros que no están perfectamente alineados a la perspectiva de la cámara y así poder que el sistema también incluya estos rostros.