AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
International Credit Hours Programs (ICHEP)
Mechatronics and Automation

Machine Vision (CSE480)

Lab 1 Report

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Python Code

```python
# ================================
# TASK 1 – Character ID Card
# ================================

import cv2
import numpy as np
from google.colab.patches import cv2_imshow


# 1. Load image
image_path = "/Mosalah.jpg"
img = cv2.imread(image_path)

if img is None:
    raise ValueError("Image not found!")

print(" ◆  Original Image:")
cv2_imshow(img)

# 2. Resize
photo = cv2.resize(img, (200, 200))
print(" ◆  Resized 200 x 200:")
cv2_imshow(photo)

# 3. Create white background
card_width = 400
card_height = 300
card = np.ones((card_height, card_width, 3), dtype=np.uint8) * 255
print(" ◆  Blank White ID Card:")
cv2_imshow(card)

# 4. Insert the photo
card[50:250, 20:220] = photo
print(" ◆  After Inserting Photo:")
cv2_imshow(card)

# 5. Add text
cv2.putText(card, "Mo Salah ", (230, 90),
            cv2.FONT_HERSHEY_SIMPLEX, 0.7, (0, 0, 0), 2)

cv2.putText(card, "Liverpool", (230, 140),
            cv2.FONT_HERSHEY_SIMPLEX, 0.6, (70, 70, 70), 2)

cv2.putText(card, "ID: 11 - 10", (230, 200),
            cv2.FONT_HERSHEY_SIMPLEX, 0.7, (0, 0, 150), 2)

print(" ◆  After Adding Text:")
cv2_imshow(card)

# 6. Add border
bordered = cv2.copyMakeBorder(card, 5, 5, 5, 5,
                              cv2.BORDER_CONSTANT, value=[0, 0, 0])
```

```python
print(" 🔹 Final Bordered ID Card:")
cv2_imshow(bordered)

# 7. Save
cv2.imwrite("/character_id_card.jpg", bordered)
print("Saved as: /character_id_card.jpg")


# ========================================
# TASK 2 — Social Media Themed Photo Frame
# ========================================


import cv2
import numpy as np
from google.colab.patches import cv2_imshow


# 1. Load image
image_path = "/Mosalah.jpg"
img = cv2.imread(image_path)

if img is None:
    raise ValueError("Image not found!")

print(" 🔹 Original Image:")
cv2_imshow(img)

# 2. Flip horizontally
flipped = cv2.flip(img, 1)
print(" 🔹 Flipped Image (Selfie Effect):")
cv2_imshow(flipped)

# 3. Create thick rectangle frame simulation
frame_img = flipped.copy()
h, w, c = frame_img.shape

color = (0, 120, 255)  # orange BGR
thickness = 25

# Draw top, bottom, left, right with margin to simulate round corners
cv2.line(frame_img, (40, 20), (w-40, 20), color, thickness)
cv2.line(frame_img, (40, h-20), (w-40, h-20), color, thickness)
cv2.line(frame_img, (20, 40), (20, h-40), color, thickness)
cv2.line(frame_img, (w-20, 40), (w-20, h-40), color, thickness)

print(" 🔹 Final Image with Rounded-Style Frame:")
cv2_imshow(frame_img)

# 4. Save
cv2.imwrite("/profile_frame.jpg", frame_img)
print("Saved as: /profile_frame.jpg")


# ========================================
```

```python
# TASK 3 — transition_scene
# ========================================

import cv2
import numpy as np
from google.colab.patches import cv2_imshow

# ------------------------------------------------------------
# 1. Load the two images
# ------------------------------------------------------------
img1_path = "/Mosalah_happy.jpg"   # Replace with your first image
img2_path = "/Mosalah_sad.jpg"    # Replace with your second image

img1 = cv2.imread(img1_path)
img2 = cv2.imread(img2_path)

if img1 is None or img2 is None:
    raise ValueError("One or both images not found! Check file paths.")

# ------------------------------------------------------------
# 2. Resize to the same size
# ------------------------------------------------------------
height = 400
width = 400

img1_resized = cv2.resize(img1, (width, height))
img2_resized = cv2.resize(img2, (width, height))

# ------------------------------------------------------------
# 3. Create 5 cross-fade frames using addWeighted
# ------------------------------------------------------------

frames = []

alphas = [0.0, 0.25, 0.5, 0.75, 1.0]   # 5 transition stages

for alpha in alphas:
    beta = 1 - alpha
    blended = cv2.addWeighted(img1_resized, alpha, img2_resized, beta, 0)
    frames.append(blended)

# ------------------------------------------------------------
# 4. Display the 5 frames (in Colab)
# ------------------------------------------------------------
for i, frame in enumerate(frames):
    print(f"Frame {i+1}  (alpha={alphas[i]})")
    cv2_imshow(frame)
    print("-" * 30)

# ------------------------------------------------------------
# 5. Save one final combined scene
# ------------------------------------------------------------
# Combine frames horizontally to show the transition
transition_scene = np.hstack(frames)

```

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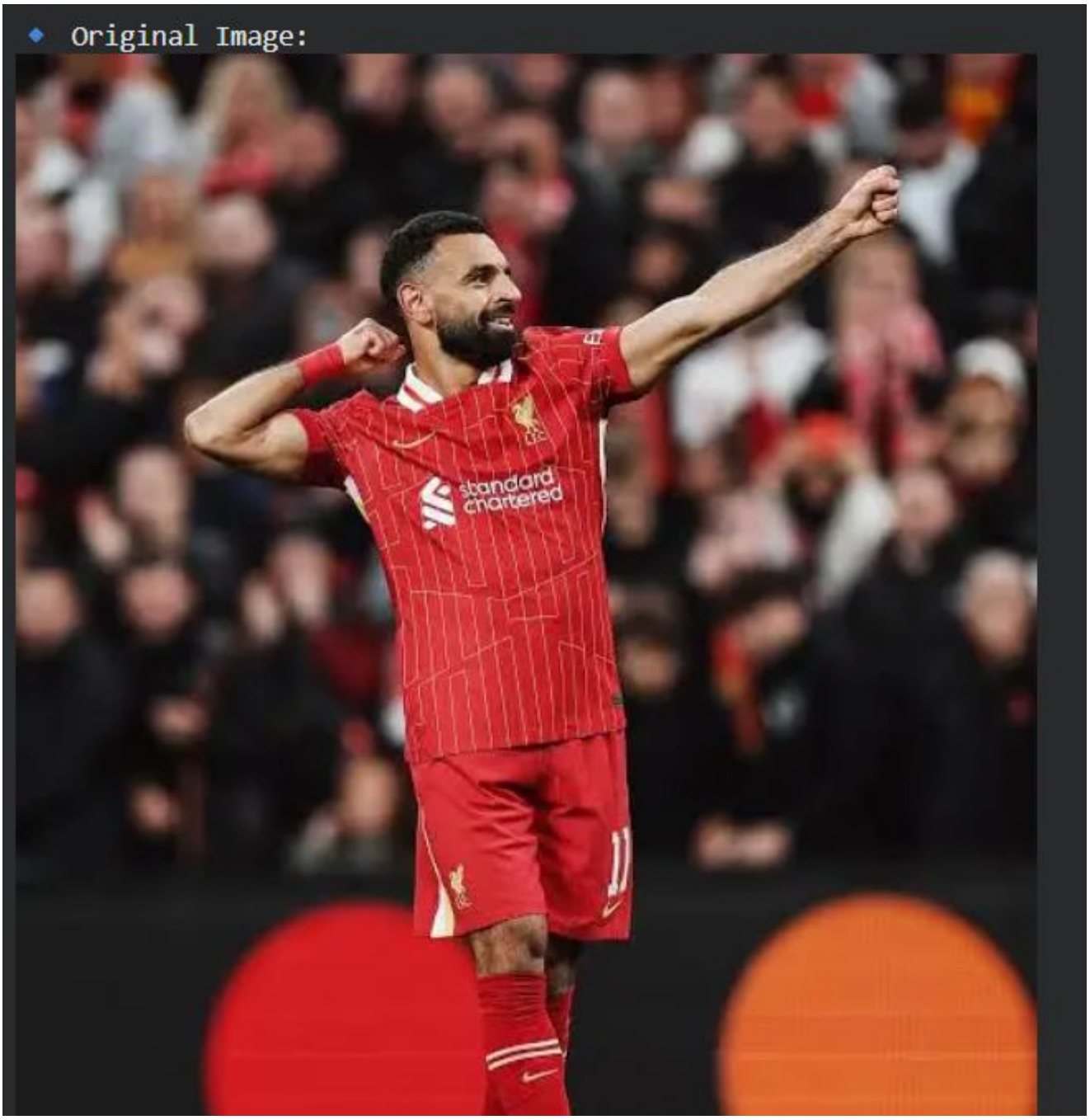
cv2.imwrite("/transition_scene.jpg", transition_scene)

print("Saved as /transition_scene.jpg")


```

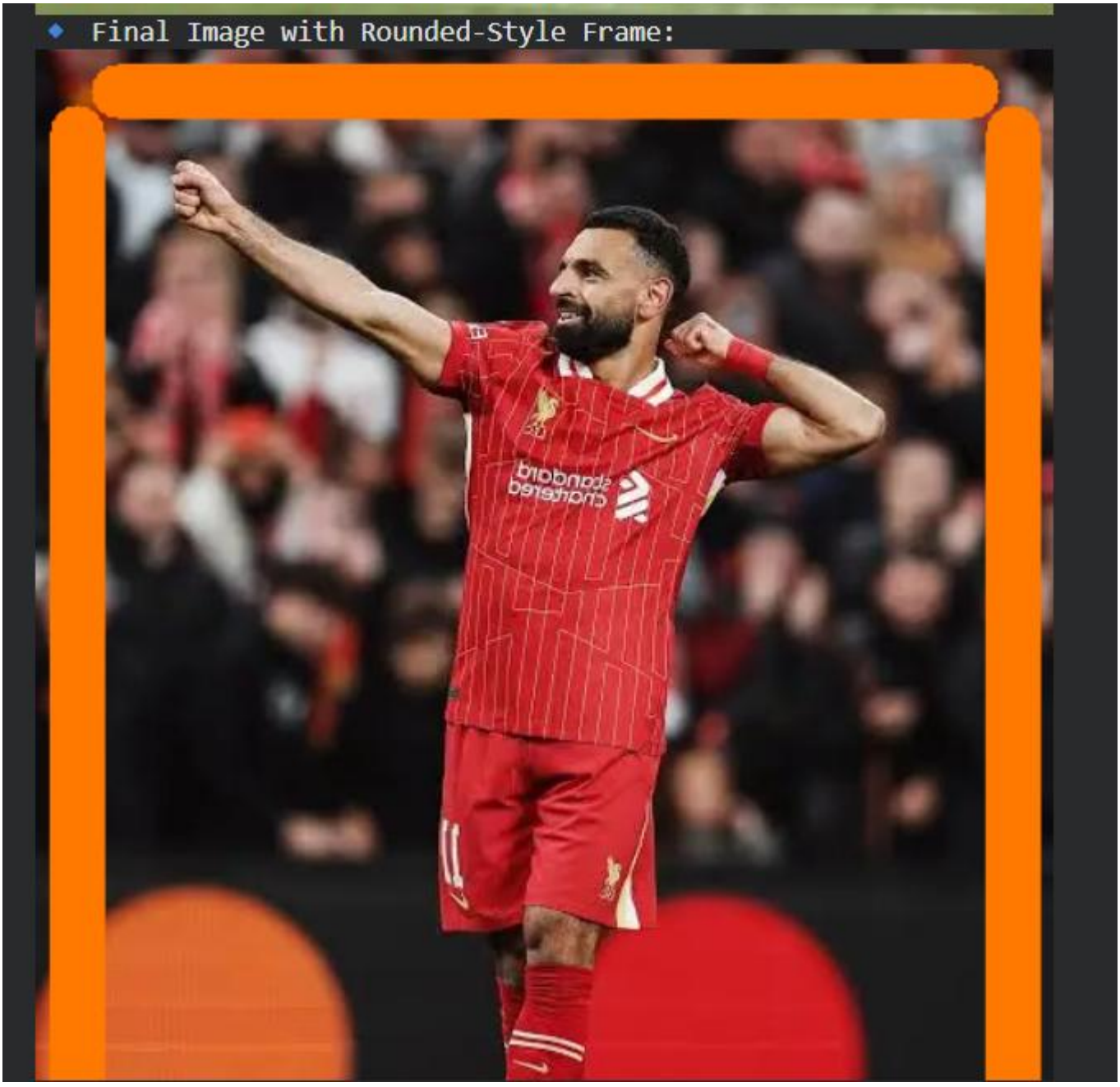
Output:
Task 1 :



🔹 Final Bordered ID Card:

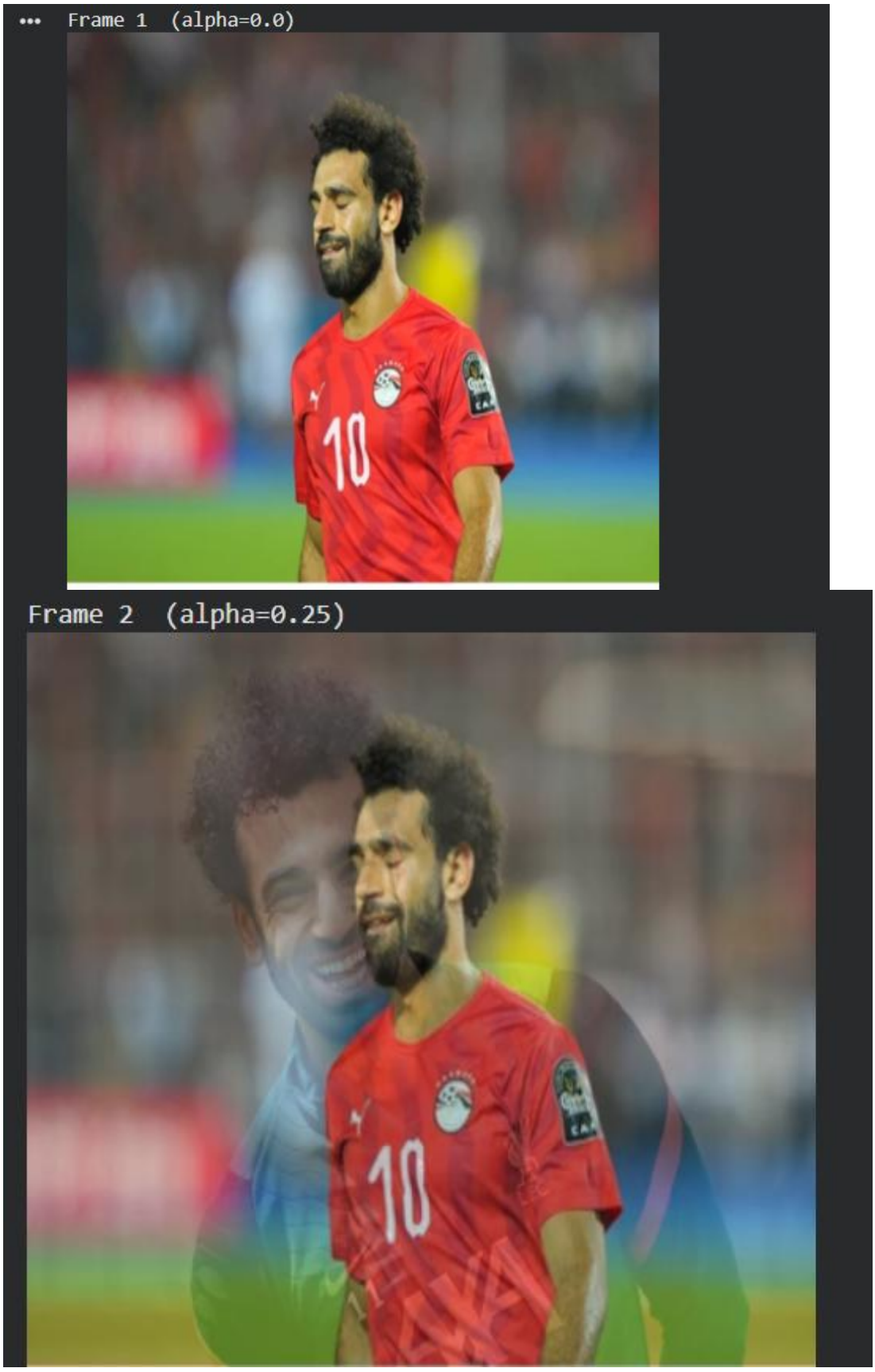
Saved as: /character_id_card.jpg

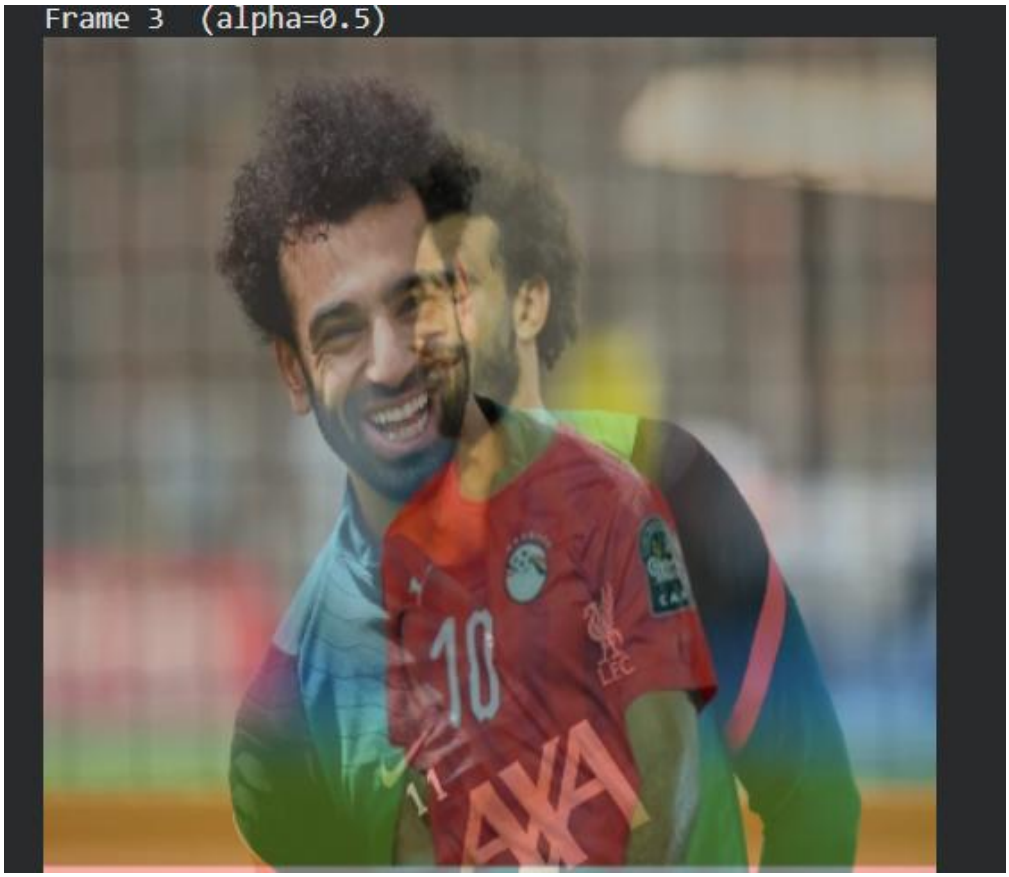
Task 2 :

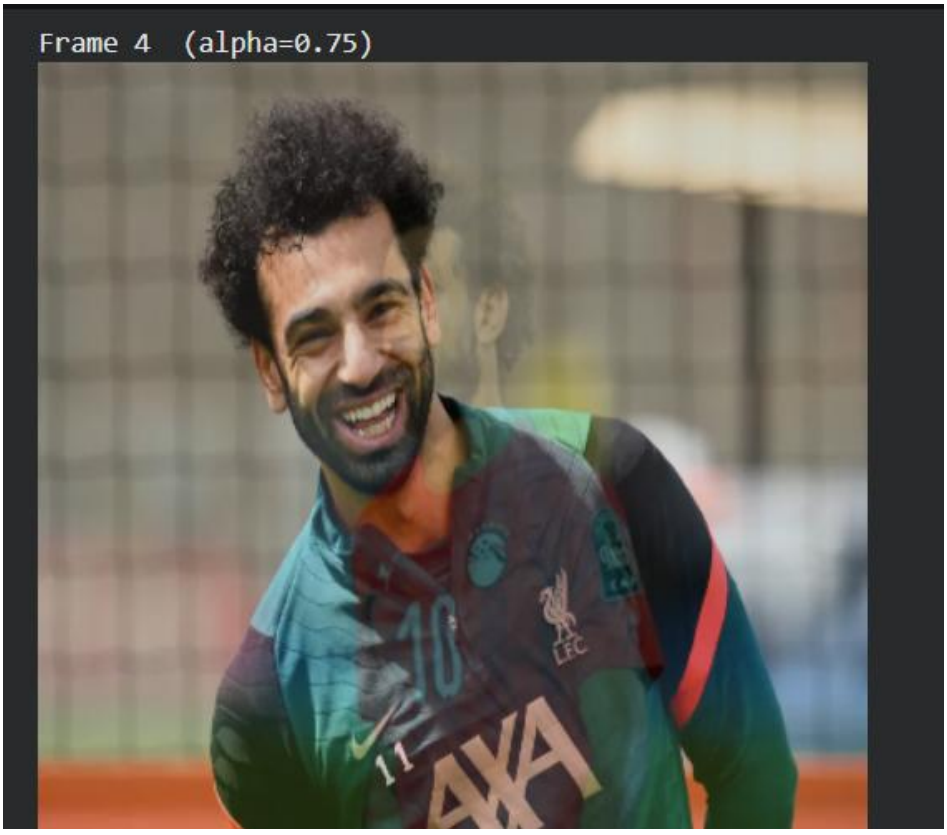

Final Image with Rounded-Style Frame:


Saved as: /profile_frame.jpg

Task 3 :




Frame 3 (alpha=0.5)


Frame 4 (alpha=0.75)

Frame 5 (alpha=1.0)

Saved as /transition_scene.jpg