Project Title: Amdox AI-Powered Task Optimizer

Group No.	7
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1. Project Overview:

The Amdox AI-Powered Task Optimizer is an intelligent web-based system that integrates facial emotion recognition and task optimization to promote emotional well-being and productivity in workplace environments. Using a combination of computer vision, deep learning, and psychological insights, the application detects an employee's emotional state through facial analysis and automatically suggests tasks that best align with their current mood and stress levels.

The system leverages DeepFace, a state-of-the-art deep learning framework for face analysis, to evaluate emotions such as happiness, sadness, anger, fear, disgust, surprise, and neutrality. Additionally, it estimates secondary attributes like age and gender, providing a comprehensive understanding of the user's emotional profile. By using a simple Streamlit interface, the application allows users to either upload an image or capture a real-time photo via webcam, ensuring accessibility and ease of use.

Once the image is processed, the system calculates several emotional parameters:

- Dominant Emotion: The emotion with the highest confidence score.
- Positive, Negative, and Neutral Scores: Aggregated emotion categories reflecting the user's mood tendency.
- Stress Score: Derived from sadness and fear intensities, this score provides an estimate of emotional strain or anxiety.

Based on these computed metrics, the recommender module intelligently maps the detected mood to a corresponding energy level (High, Medium, Low) and provides a set of task suggestions tailored to that state. For instance:

- If a user appears happy and relaxed, the system recommends productive and high-focus tasks such as leading meetings or working on complex projects.

- If the user shows stress or negative emotions, it suggests low-intensity or restorative activities, such as taking breaks or performing mindfulness exercises.
- For neutral emotional states, it proposes routine organizational tasks to maintain engagement without inducing fatigue.

The project reflects the growing trend of AI-driven emotional intelligence (EQ-AI) being applied in corporate and educational environments. By understanding employees' emotional contexts, organizations can enhance motivation, reduce burnout, and improve overall performance.

From a technical perspective, the solution showcases a seamless integration of several Python libraries:

- DeepFace for deep learning-based face and emotion recognition
- TensorFlow as the underlying neural network framework
- OpenCV and Pillow for image processing
- Streamlit for creating a responsive, interactive web application
- NumPy and Pandas for numerical and tabular data management

The project also emphasizes ethical AI design, ensuring that facial data is processed locally without being stored, thereby maintaining user privacy and security.

2. Objectives

・Analyze the emotional state (happy, sad, angry, neutral, etc.) of a user using DeepFace.

・Estimate additional attributes such as age and gender.

・Compute emotional scores and a stress indicator.

・ Recommend appropriate tasks based on the detected mood category (Positive, Neutral, or Negative).

・Provide a user-friendly web interface for both image upload and live webcam input.

3. Tech Stack

Category	Tools/Libraries
Language	Python 3.10
Frontend/UI	Streamlit
Deep Learning	TensorFlow, DeepFace
Computer Vision	OpenCV, Numpy, Pillow (PIL)
Data Handling	Pandas
Deployment	Streamlit Cloud or Localhost

4. Installation and Setup

A. Create a Virtual Environment

```
python –m venv venv

venv\Scripts\activate      #for Windows
```

B. Install Required Packages

```
pip install streamlit deepface tensorflow opencv-python pillow pandas numpy
```

C. Run the App

```
streamlit run web.py
```

Then open the link shown in your terminal (usually http://localhost:8501).

5. Working of the Application

Step 1: Choose Input Source

Users can either:

- Upload a face image (.jpg, .jpeg, .png)
- Capture a live photo using the webcam

Step 2: Face Analysis

- The image is passed to DeepFace.analyze() with actions = ['emotion', 'age', 'gender'].
- DeepFace returns probabilities for emotions (happy, sad, angry, etc.).
- The app calculates Positive, Negative, and Neutral scores.
- A stress score is computed as an indicator of emotional strain.

Step 3: Task Recommendation

Based on the emotion category and stress score:

Emotion Category	**Stress Level**	**Recommended Task Type**
Positive	Low	Deep work, project leadership
Neutral	Medium	Routine or maintenance tasks
Negative	High	Rest, mindfulness, or light work

Step 4: Results Display

- Dominant emotion
- Emotion probability table
- Scores and stress level
- Recommended energy level and tasks

Attention warning if stress > threshold

6. Core Logic

A. Emotion Analysis Function

```
17    def analyze_face_emotion(image_array):
18        try:
19            # DeepFace requires either path or NumPy array,
20            result = DeepFace.analyze(
21                img_path=image_array,
22                actions=['emotion', 'age', 'gender'],
```

B. Task Recommendation Logic

```
55    def recommend_task(category, stress_score, positive_score):
56        if category == 'Positive' and stress_score < 0.2:
57            level = 'High'
58            tasks = ["Work on challenging project", "Lead a meeting", "Deep
59        elif category == 'Negative' or stress_score > 0.3:
60            level = 'Low'
61            tasks = ["Take a short break", "Mindfulness activity", "Review
62        else:
63            level = 'Medium'
```

7. requirements.txt

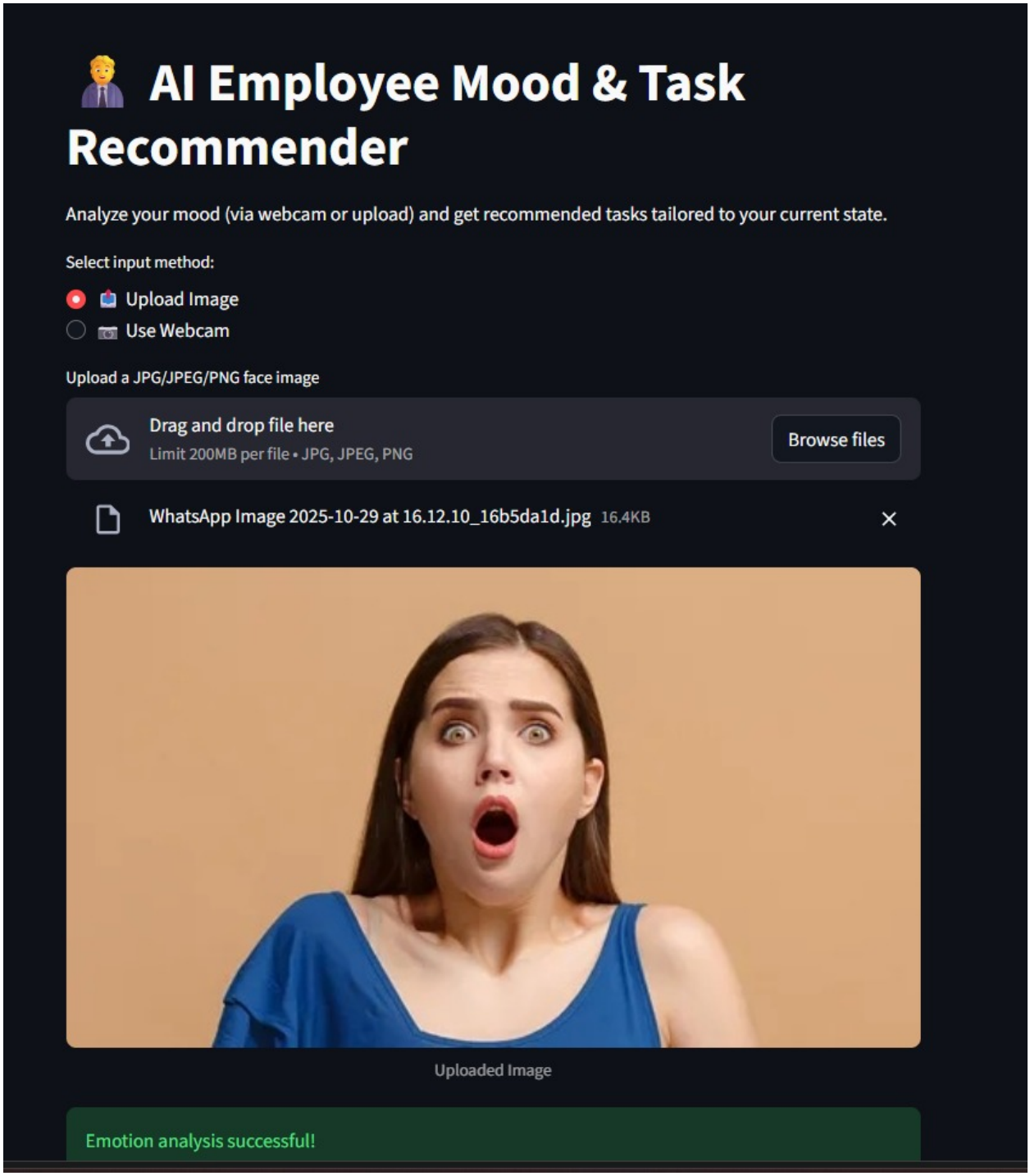
requirements.txt

```
# Streamlit App + DeepFace (TensorFlow 2.12 c
streamlit==1.38.0

# Deep Learning and Face Analysis
deepface==0.0.79
tensorflow-intel==2.12.0
keras==2.12.0

# Core ML / CV Libraries
opencv-python-headless==4.8.0.76
numpy==1.23.5
pandas==1.5.3
scikit-learn==1.3.0
```

8. Sample Output



Dominant Emotion: surprise

Category: Positive

Age: 31 | **Gender:** Woman

Emotion Scores

	Emotion	Score
0	angry	0.00000000007
1	disgust	0.000000000000000000000008
2	fear	0.00001
3	happy	0.00000000002
4	sad	0.00000000000004
5	surprise	100
6	neutral	0.0000000000000000007

Positive Score: 1.00

Negative Score: 0.00

Stress Score: 0.00

Energy Level Recommended: High

Task Recommendations

- Work on challenging project
- Lead a meeting
- Deep work session