STUDENT ATTENDANCE SHEET

ON EXCEL

BY FACE RECOGNITION SYSTEM ON

PYTHON

What is Face Recognition :

Face Recognition is a **technology in computer vision**. In Face recognition / detection we locate and visualize the human faces in any digital image. It is a subdomain of Object Detection, where we try to observe the instance of semantic objects.

Facial recognition is a category of **biometric security**. Other forms of biometric software include voice recognition, fingerprint recognition, and eye retina or iris recognition. The technology is mostly used for security and law enforcement, though there is increasing interest in other areas of use.

Process of Making Face Recognition System :

First we need **SIX(6)** modules installed to get started

1.) **CV2** : It captures the video feed from the webcam and performs image processing.

2.) **Face_Recognition** : It is the showstopper module in this project. It extracts the data of facial complexities and performs several complicated processing to take unique data of the video feed face and pre trained faces.

3.) **NumPy** : It performs complicated Mathematical calculation to find the best possible match of the pre trained images and the images taken from video feed.

4.) **OS** : It helps the program to find the proper directory to run a loop through that directory to access the trained images.

5.) **CSV** : It helps the program to create an Excel file and perform all the file handling related tasks to register the data from the program output.

6.) **datetime** : It captures the exact date time to give the Excel file a name based on (Date-Month-Year) and also captures the exact time of check in in terms of (Hour : Minute : Seconds)

Face Recognition system.py

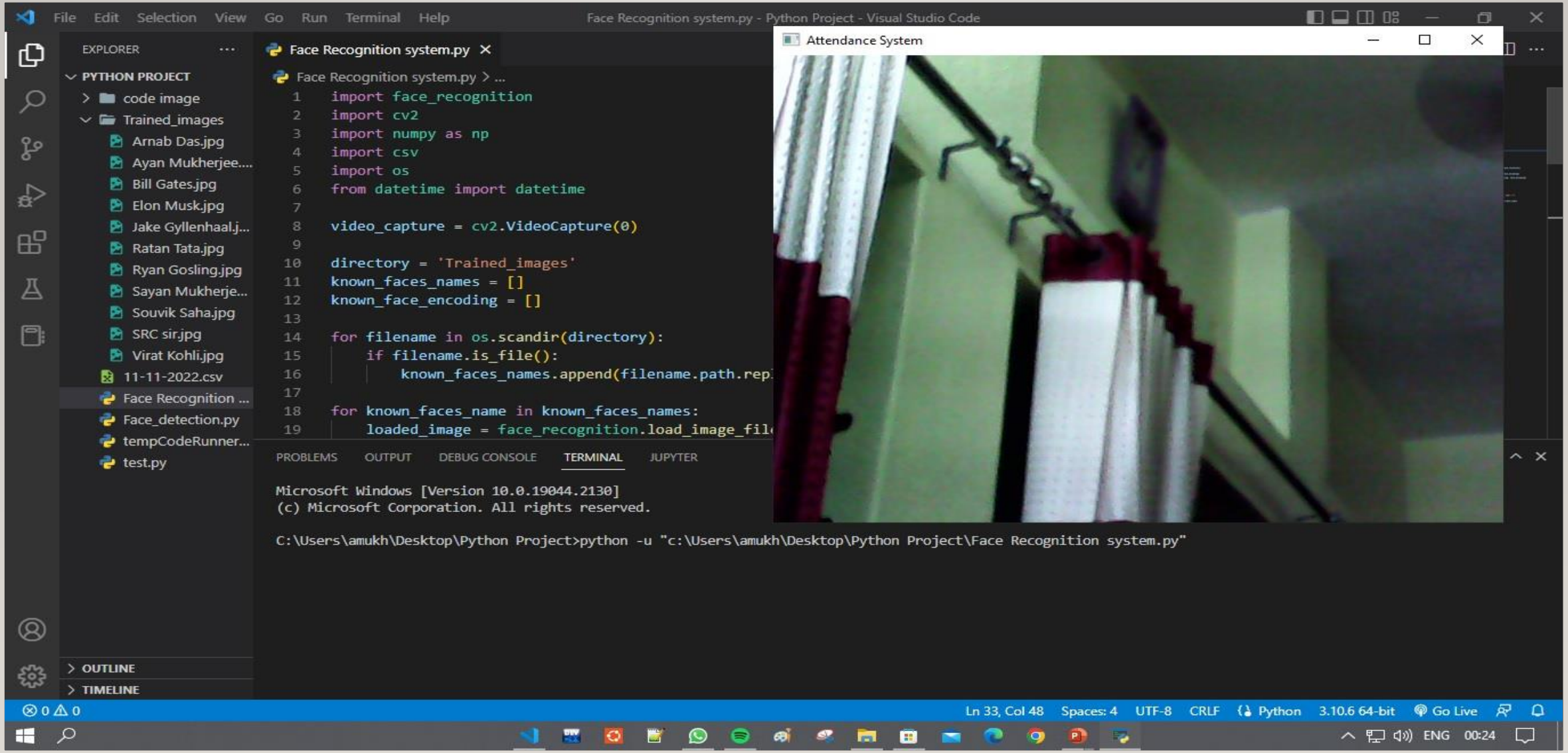
```python
import face_recognition
import cv2
import numpy as np
import csv
import os
from datetime import datetime

video_capture = cv2.VideoCapture(0)

directory = 'Trained_images'
known_faces_names = []
known_face_encoding = []

for filename in os.scandir(directory):
    if filename.is_file():
        known_faces_names.append(filename.path.replace("\\", "/" ))

for known_faces_name in known_faces_names:
    loaded_image = face_recognition.load_image_file(known_faces_name)
    generated_encoding = face_recognition.face_encodings(loaded_image)[0]
    known_face_encoding.append(generated_encoding)

students = known_faces_names.copy()

face_locations = []
face_encodings = []
face_names = []
s = True

now = datetime.now()
current_date = now.strftime("%d-%m-%Y")

f = open(current_date+'.csv','w+',newline = '')
```

```
lnwriter = csv.writer(f)

while True:
    _,frame = video_capture.read()
    small_frame = cv2.resize(frame,(0,0),fx = 0.25,fy = 0.25)
    rgb_small_frame = small_frame[:,:,::-1]
    if s:
        face_locations = face_recognition.face_locations(rgb_small_frame)
        face_encodings = face_recognition.face_encodings(rgb_small_frame, face_locations)
        face_names = []
        for face_encoding in face_encodings:
            matches = face_recognition.compare_faces(known_face_encoding, face_encoding)
            name = ""
            face_distance = face_recognition.face_distance(known_face_encoding, face_encoding)
            best_match_index = np.argmin(face_distance)
            if matches[best_match_index]:
                name = known_faces_names[best_match_index]

            face_names.append(name)
            if name in known_faces_names:
                if name in students:
                    students.remove(name)
                    student_name = name.replace(directory+"/","").replace(".jpg","")
                    now_new = datetime.now()
                    current_time = now_new.strftime("%H:%M:%S")
                    print("'" + student_name + "'" + "Checked in at : "+ current_time)
                    lnwriter.writerow([student_name,current_time])
    cv2.imshow("Attendence System", frame)
    if cv2.waitKey(1) & 0xFF == ord('q'):
        print("Attendence Taken Successfully")
        break

video_capture.release()
```

```
67    cv2.destroyAllWindows()
68    f.close()
```

Trained Images List :

OUTPUTS OF THE PROGRAM


File Edit Selection View Go Run Terminal Help
Face Recognition system.py - Python Project - Visual Studio Code
EXPLORER
PYTHON PROJECT
code image
Trained_images
Arnab Das.jpg
Ayan Mukherjee....
Bill Gates.jpg
Elon Musk.jpg
Jake Gyllenhaal.j...
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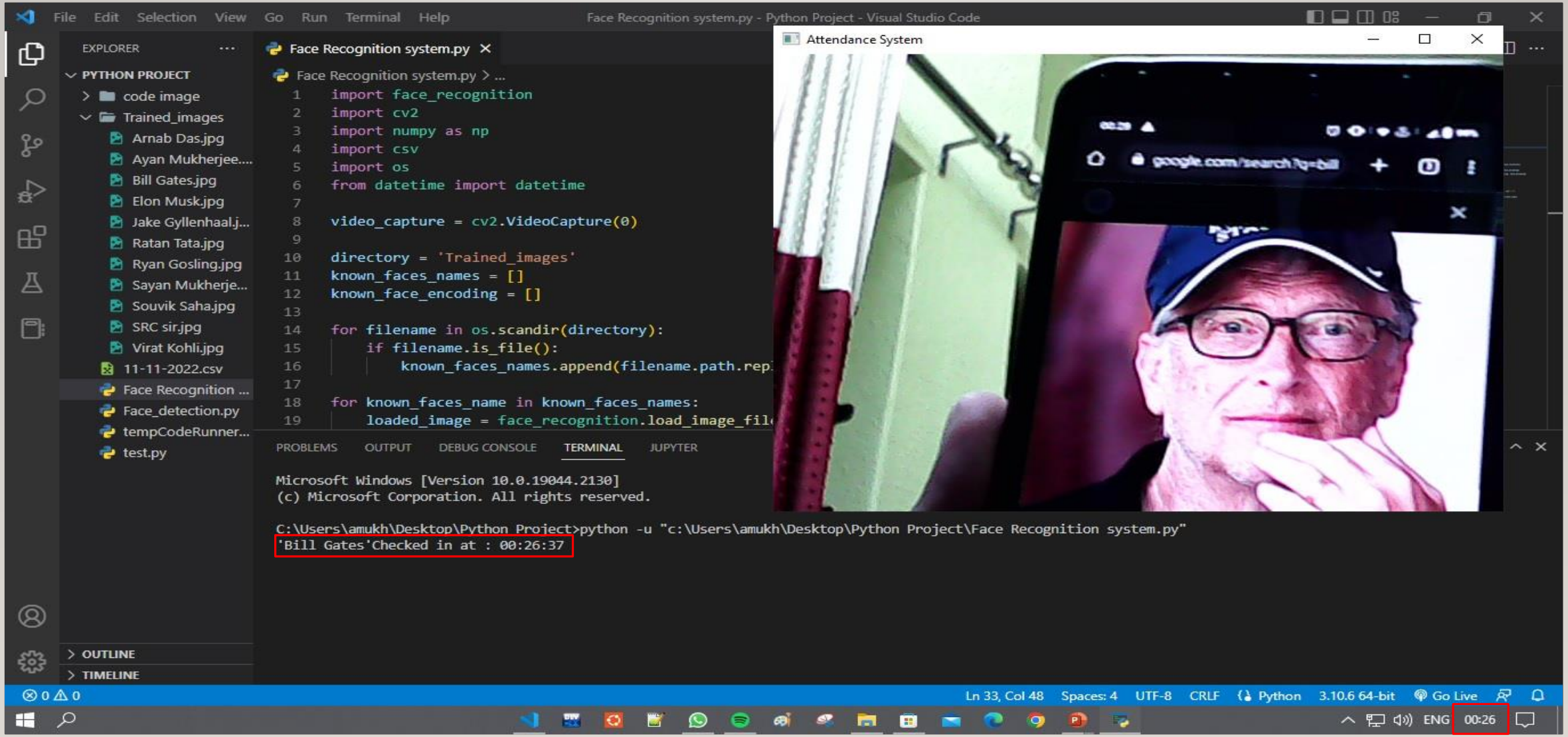
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Microsoft Windows [Version 10.0.19044.2130]
(c) Microsoft Corporation. All rights reserved.
C:\Users\amukh\Desktop\Python Project>python -u "c:\Users\amukh\Desktop\Python Project\Face Recognition system.py"
OUTLINE
TIMELINE
0 0
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG 00:24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'Bill Gates'Checked in at : 00:26:37
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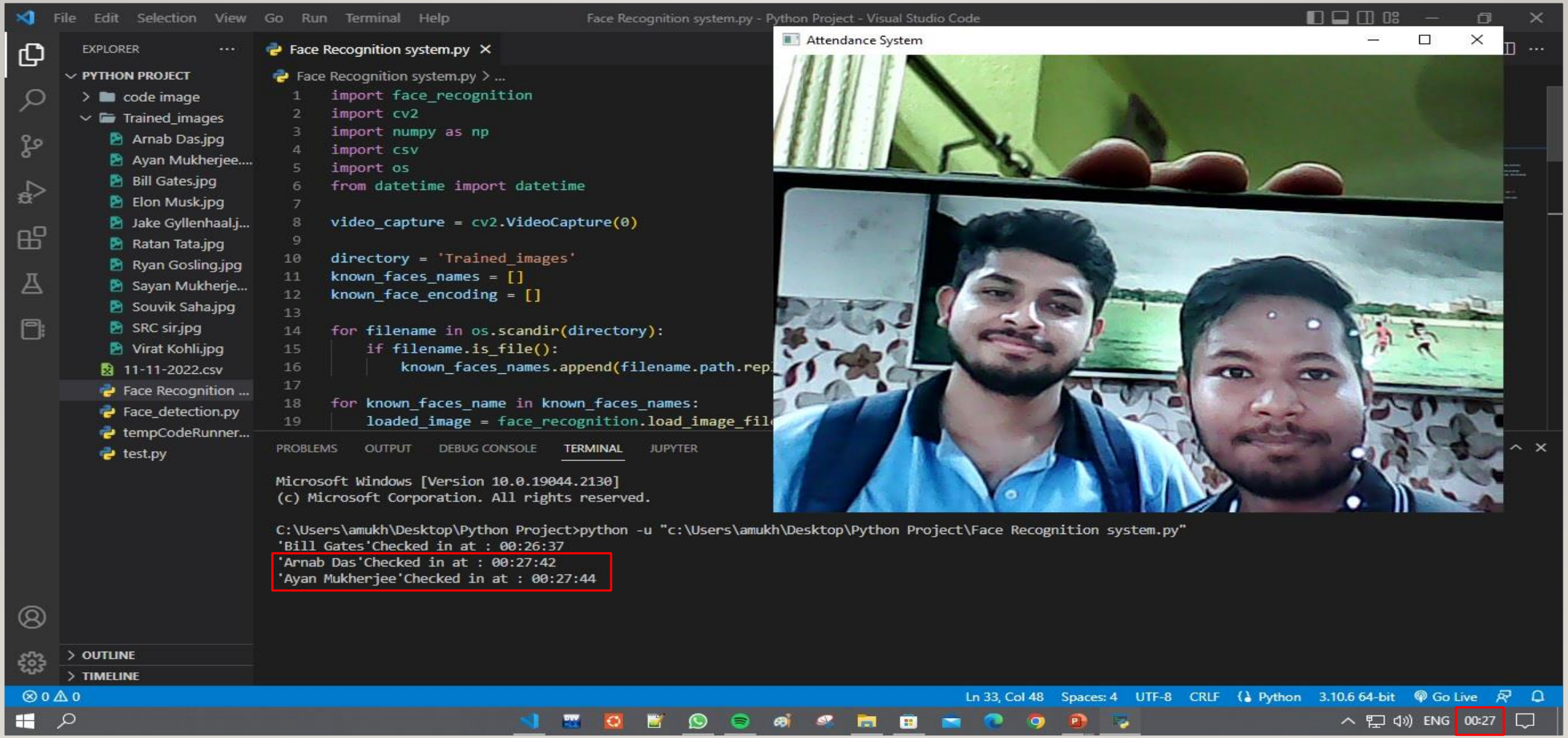
00:26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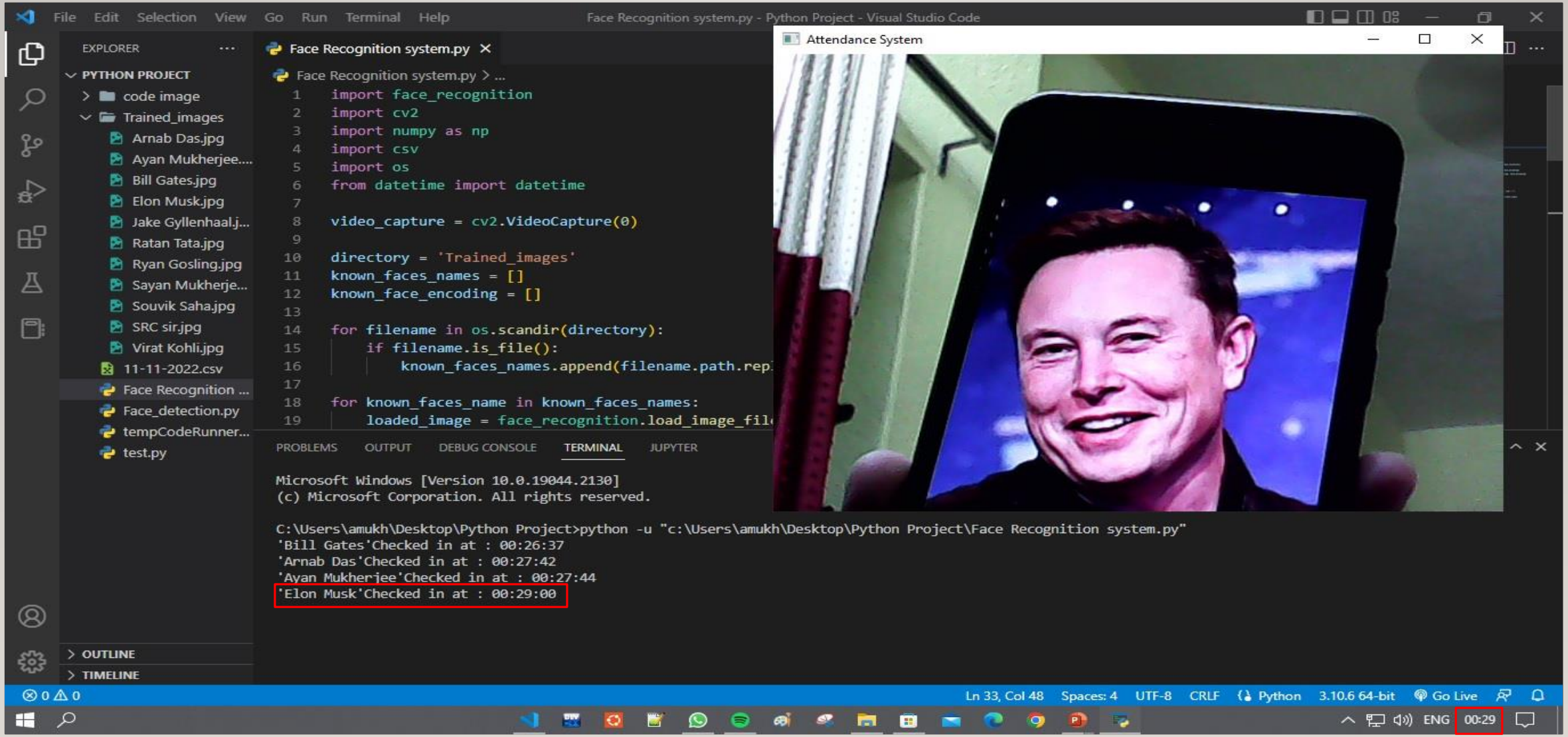
ENG 00:27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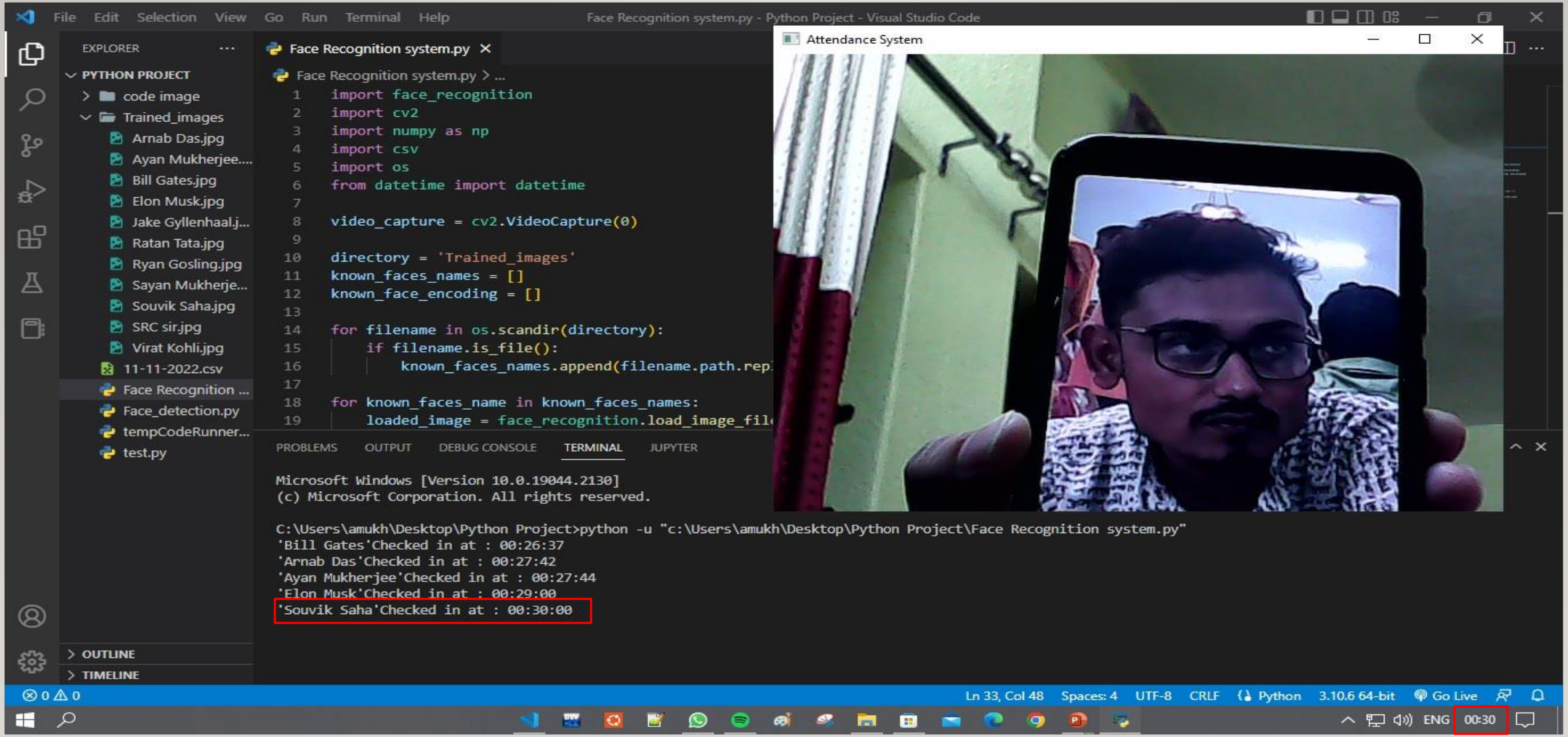
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG 00:29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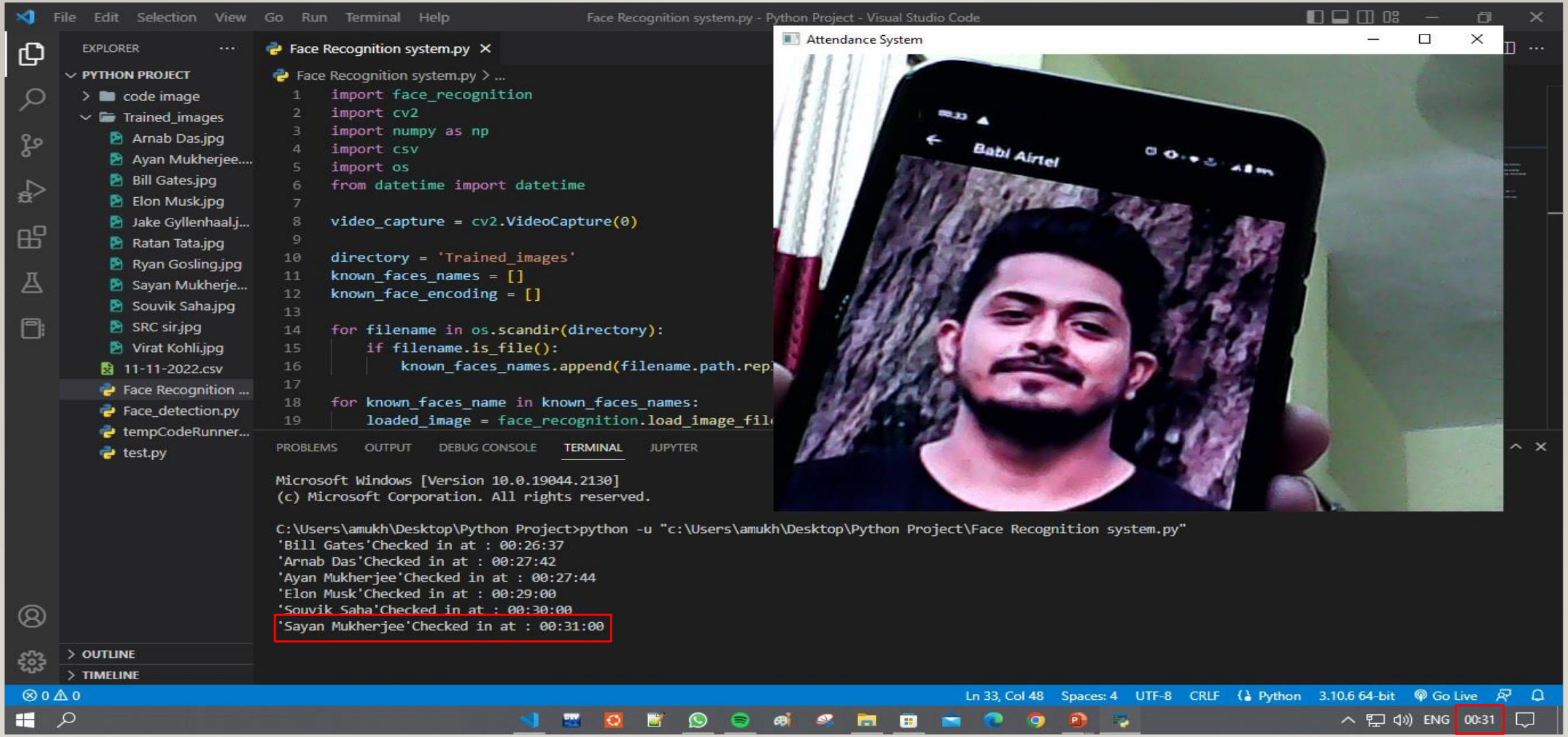
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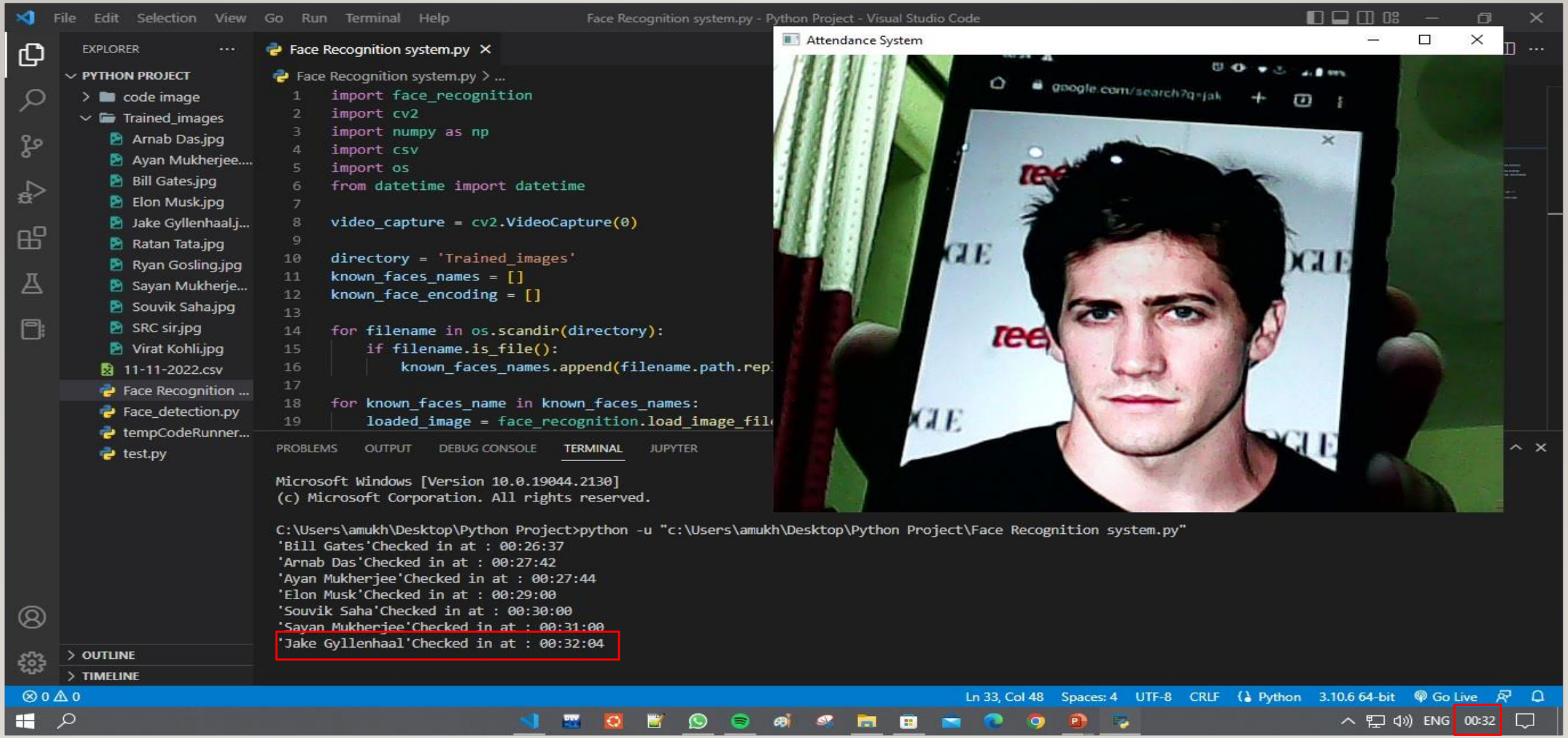
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG
00:31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OUTLINE
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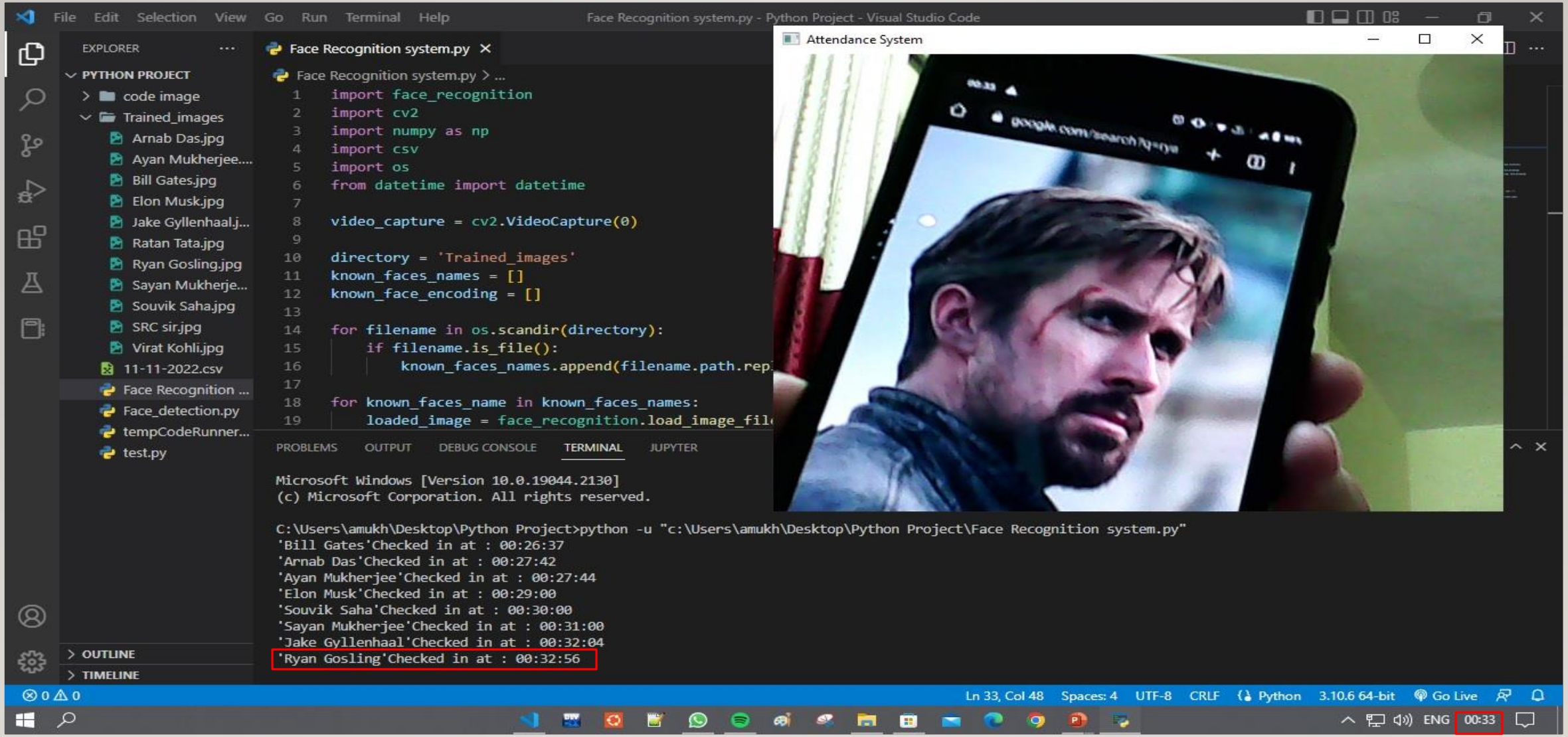
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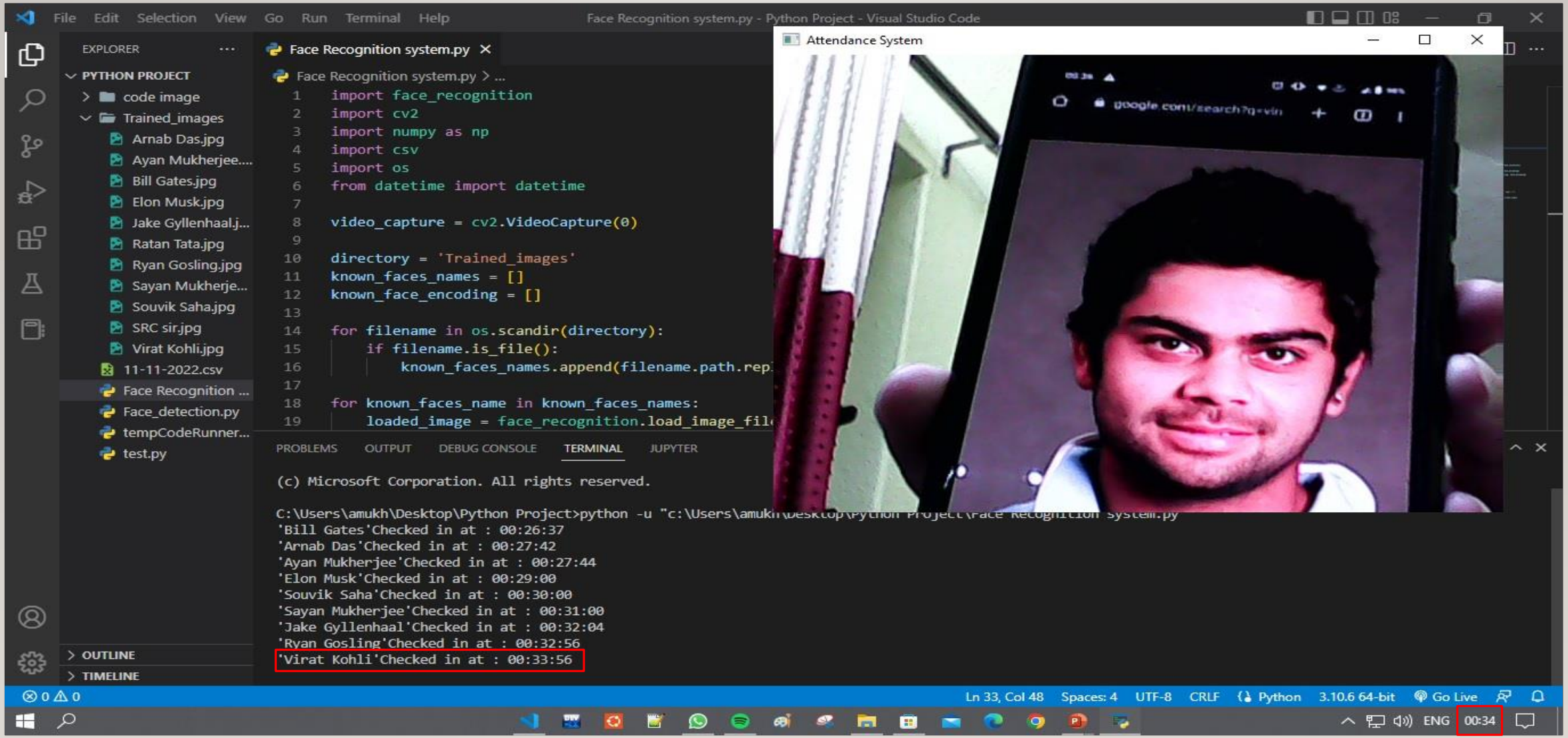
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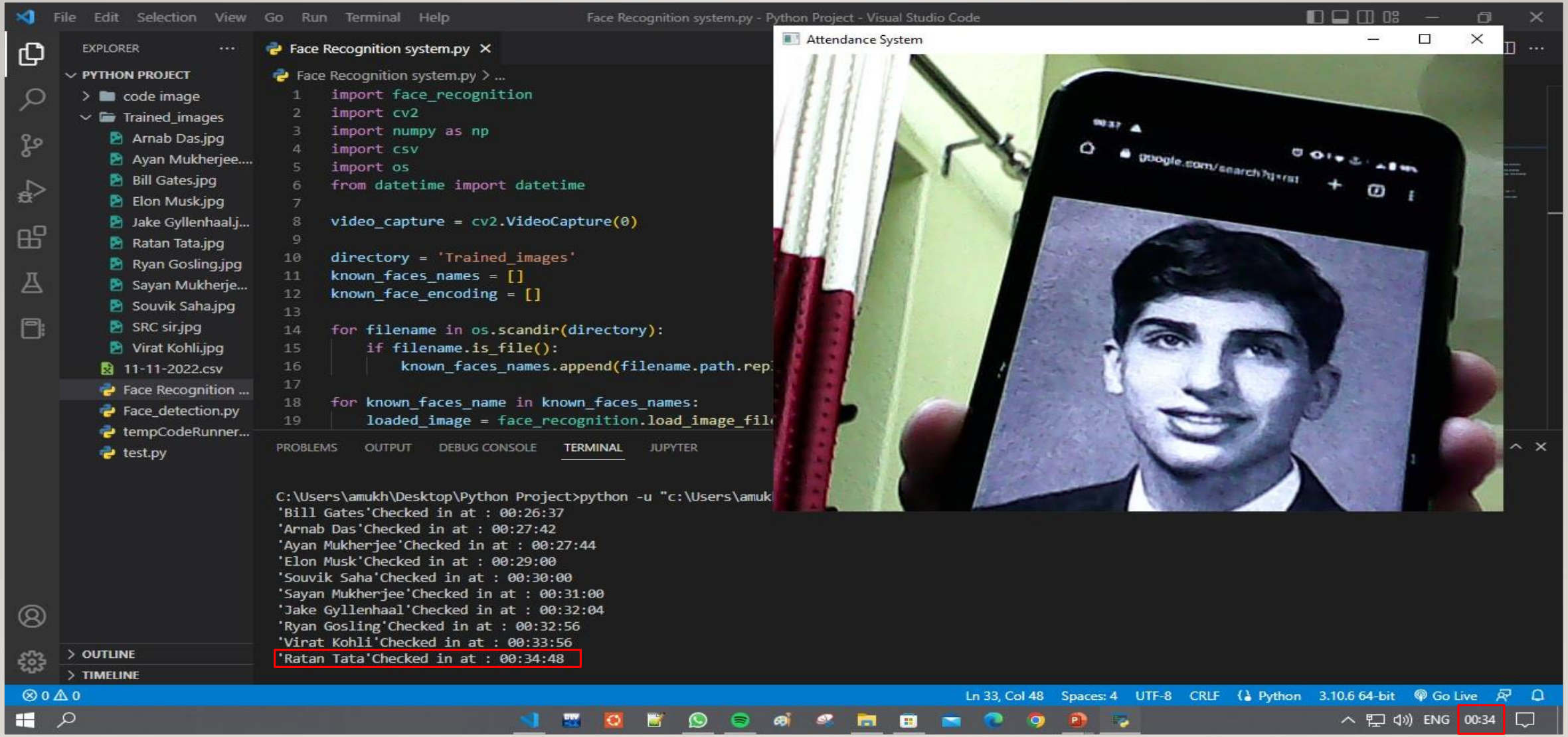
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C:\Users\amukh\Desktop\Python Project>python -u "c:\Users\amuk
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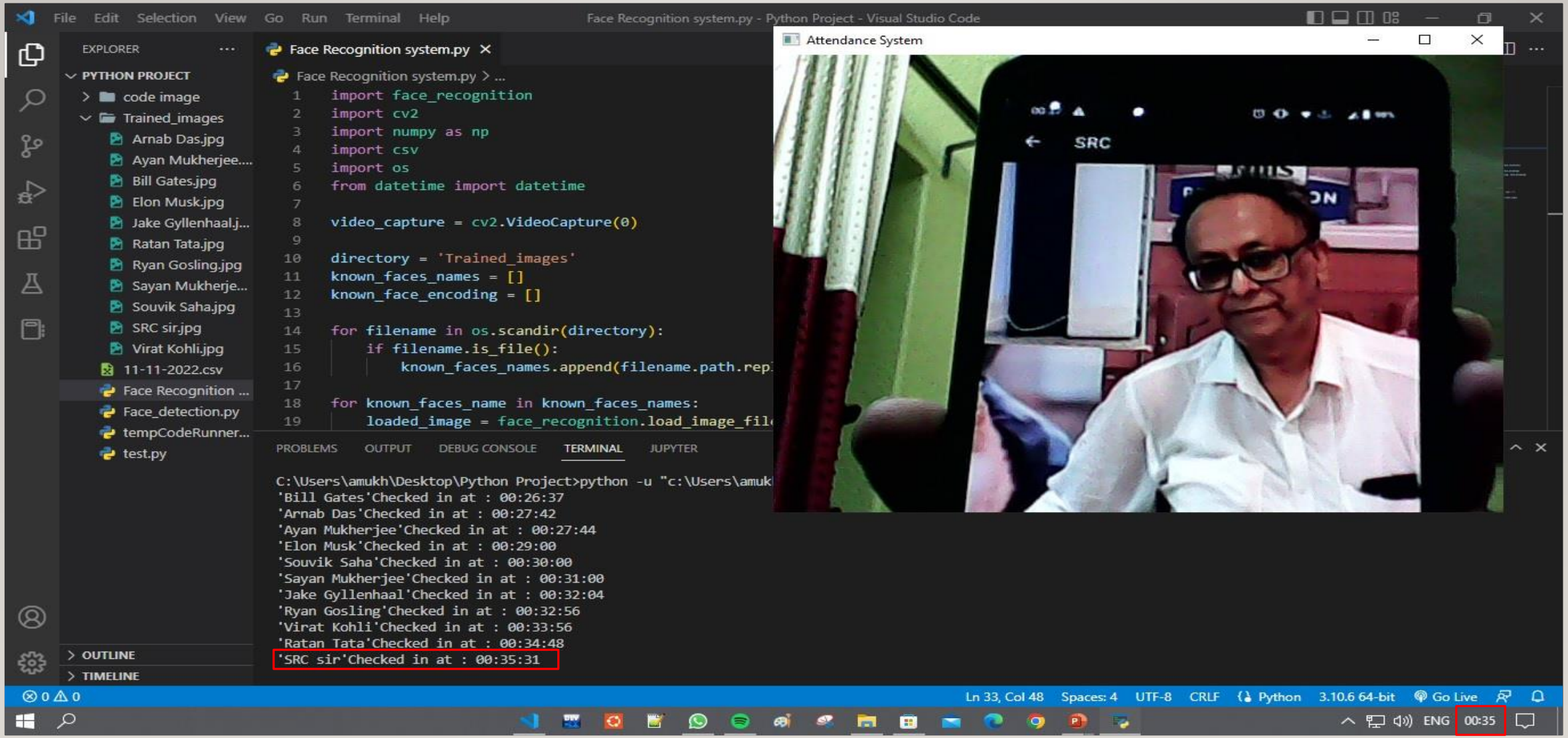
'Arnab Das'Checked in at : 00:27:42
'Ayan Mukherjee'Checked in at : 00:27:44
'Elon Musk'Checked in at : 00:29:00
'Souvik Saha'Checked in at : 00:30:00
'Sayan Mukherjee'Checked in at : 00:31:00
'Jake Gyllenhaal'Checked in at : 00:32:04
'Ryan Gosling'Checked in at : 00:32:56
'Virat Kohli'Checked in at : 00:33:56
'Ratan Tata'Checked in at : 00:34:48
Attendance System
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG
00:34


File Edit Selection View Go Run Terminal Help
Face Recognition system.py - Python Project - Visual Studio Code
EXPLORER
PYTHON PROJECT
code image
Trained_images
Arnab Das.jpg
Ayan Mukherjee....
Bill Gates.jpg
Elon Musk.jpg
Jake Gyllenhaal.j...
Ratan Tata.jpg
Ryan Gosling.jpg
Sayan Mukherje...
Souvik Saha.jpg
SRC sir.jpg
Virat Kohli.jpg
11-11-2022.csv
Face Recognition ...
Face_detection.py
tempCodeRunner...
test.py
OUTLINE
TIMELINE
Face Recognition system.py
Face Recognition system.py > ...
1 import face_recognition
2 import cv2
3 import numpy as np
4 import csv
5 import os
6 from datetime import datetime
8 video_capture = cv2.VideoCapture(0)
10 directory = 'Trained_images'
11 known_faces_names = []
12 known_face_encoding = []
14 for filename in os.scandir(directory):
15 if filename.is_file():
16 known_faces_names.append(filename.path.rep
18 for known_faces_name in known_faces_names:
19 loaded_image = face_recognition.load_image_fil
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
C:\Users\amukh\Desktop\Python Project>python -u "c:\Users\amuk
'Bill Gates'Checked in at : 00:26:37
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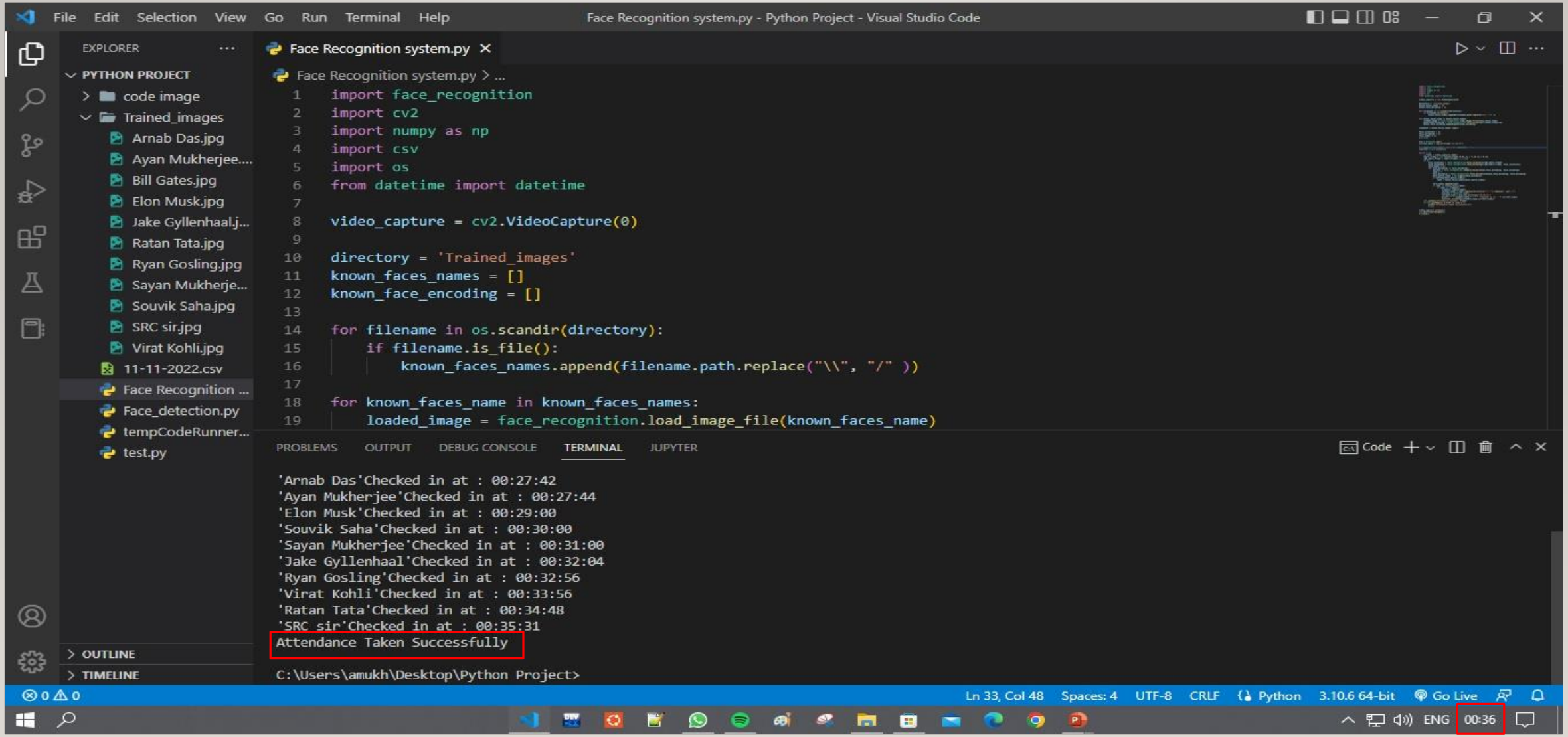
'Ratan Tata'Checked in at : 00:34:48
'SRC sir'Checked in at : 00:35:31
Attendance System
SRC
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG 00:35


File Edit Selection View Go Run Terminal Help
Face Recognition system.py - Python Project - Visual Studio Code
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code image
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Arnab Das.jpg
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1 import face_recognition
2 import cv2
3 import numpy as np
4 import csv
5 import os
6 from datetime import datetime
7
8 video_capture = cv2.VideoCapture(0)
9
10 directory = 'Trained_images'
11 known_faces_names = []
12 known_face_encoding = []
13
14 for filename in os.scandir(directory):
15 if filename.is_file():
16 known_faces_names.append(filename.path.replace("\\", "/"))
17
18 for known_faces_name in known_faces_names:
19 loaded_image = face_recognition.load_image_file(known_faces_name)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Code
'Arnab Das'Checked in at : 00:27:42
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'Elon Musk'Checked in at : 00:29:00
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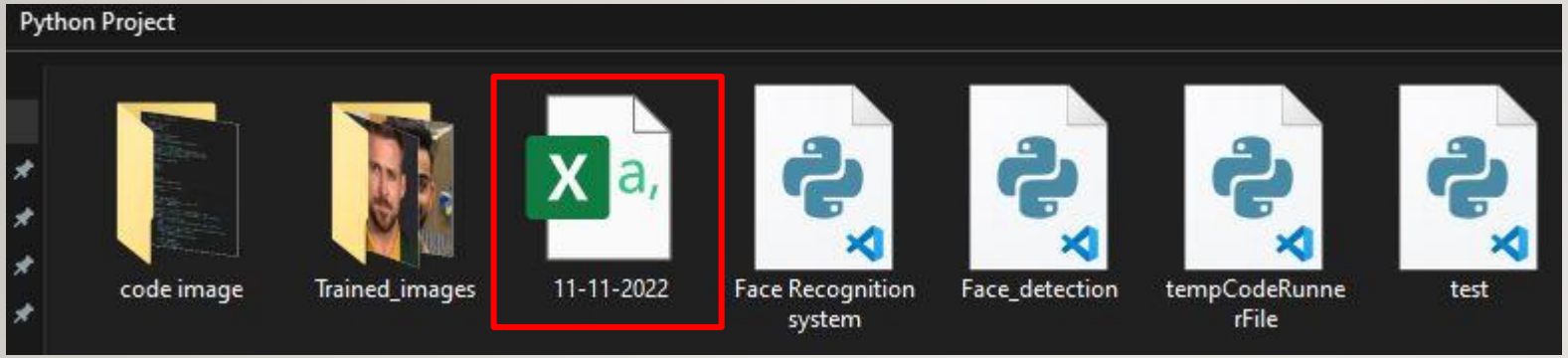
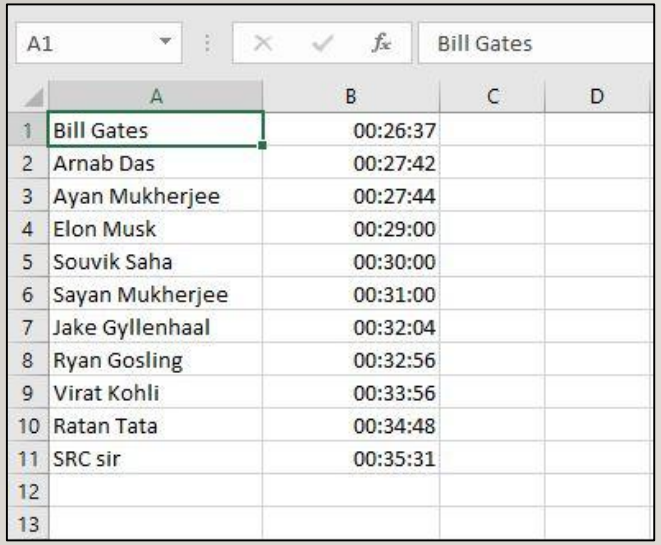
Attendance Taken Successfully
C:\Users\amukh\Desktop\Python Project>
Ln 33, Col 48 Spaces: 4 UTF-8 CRLF Python 3.10.6 64-bit Go Live
ENG
00:36

Excel File Creation :



Excel File Data Images :



A1 | Bill Gates

	A	B	C	D
1	Bill Gates	00:26:37		
2	Arnab Das	00:27:42		
3	Ayan Mukherjee	00:27:44		
4	Elon Musk	00:29:00		
5	Souvik Saha	00:30:00		
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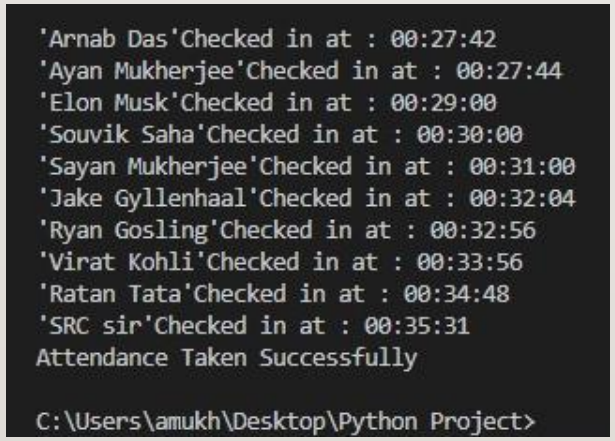
7	Jake Gyllenhaal	00:32:04		
8	Ryan Gosling	00:32:56		
9	Virat Kohli	00:33:56		
10	Ratan Tata	00:34:48		
11	SRC sir	00:35:31		
12				
13				



```
'Arnab Das'Checked in at : 00:27:42
'Ayan Mukherjee'Checked in at : 00:27:44
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'SRC sir'Checked in at : 00:35:31
Attendance Taken Successfully

C:\Users\amukh\Desktop\Python Project>
```

Purpose of this Project :

We have seen lots of mayhem in recent few years and one of them was COVID-19 which vastly dominated the cause of various changes in our society till date.

In 21st century where everything is digitally connected with everything, Our this little project is looking forward to join this revolution.

This Face Recognition system is very accurate and effective and posts a challenge to the various biometric security options available out there.

As this process is contactless, it is very beneficial to implement Face Recognition system, making it a good alternative of fingerprint scanner because that is touched by many people and that is the last thing you want in COVID effected society.

Face Recognition system significantly decreases the chance of contamination.

As we have shown just one use of the Face Recognition process implementing with Attendance System, In Real possibilities are endless.