SOFTWARE PACKAGE DEVELOPMENT

SMART ATTENDANCE SYSTEM

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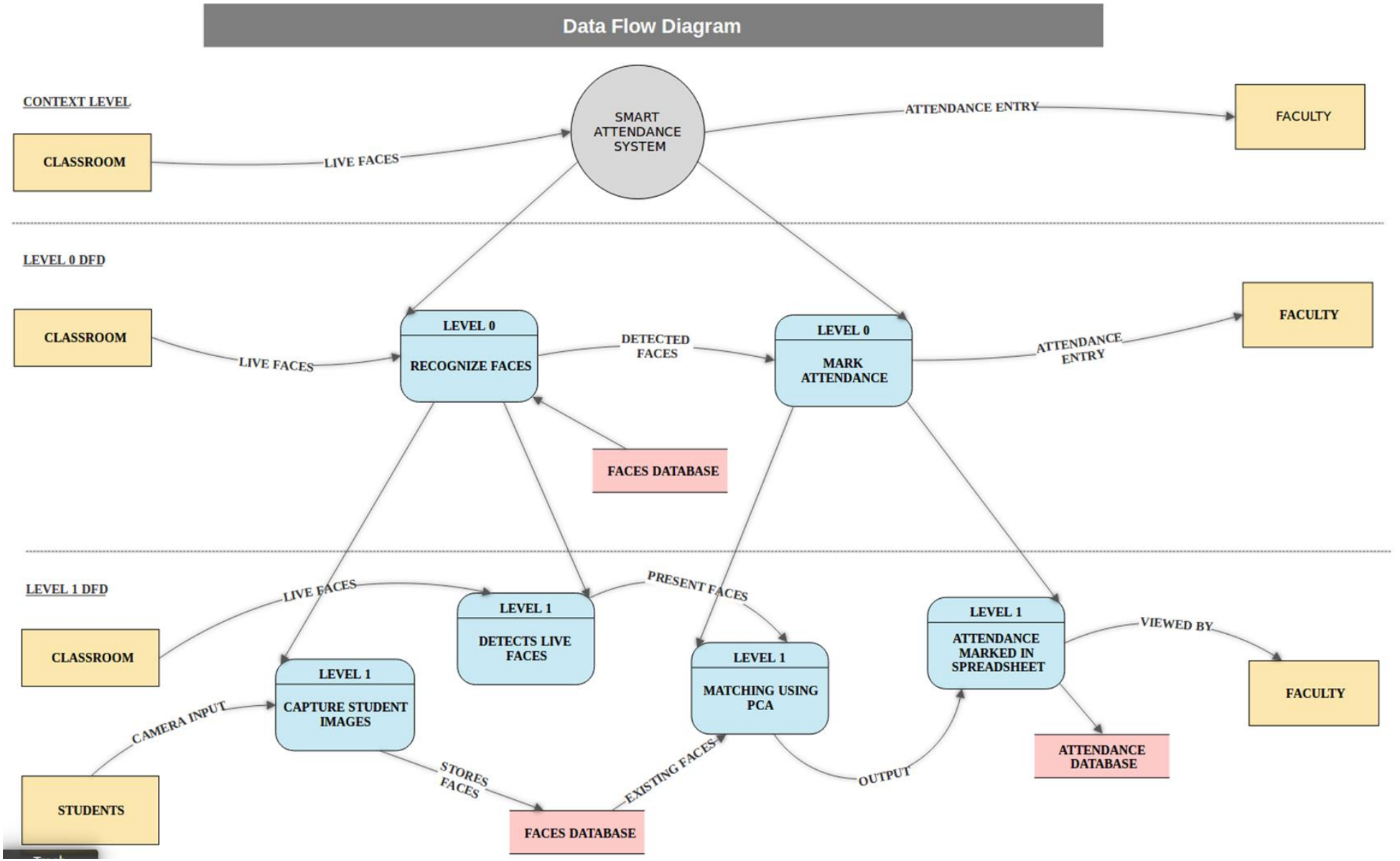
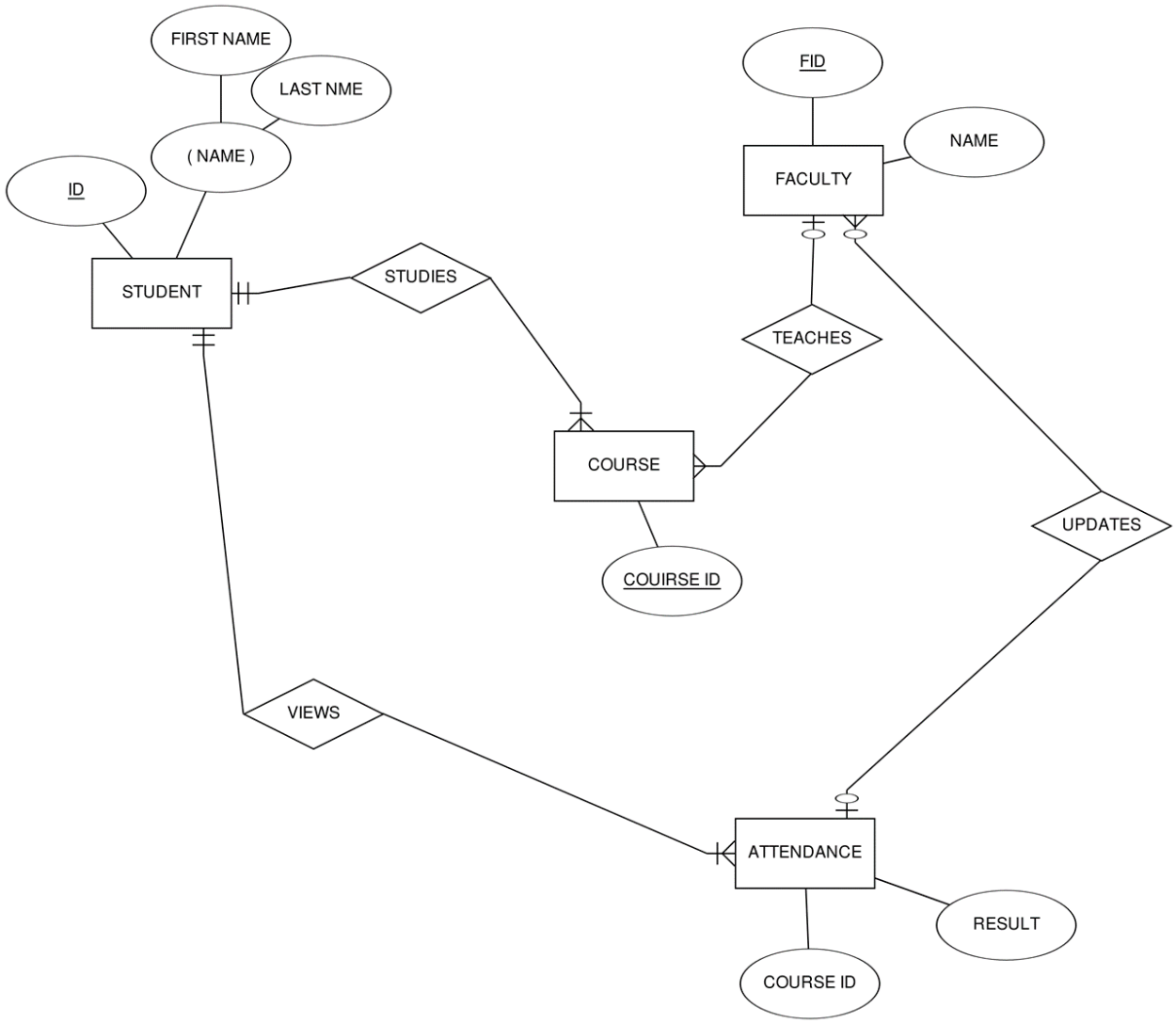

Data Flow Diagram
CONTEXT LEVEL
CLASSROOM
LIVE FACES
SMART ATTENDANCE SYSTEM
ATTENDANCE ENTRY
FACULTY
LEVEL 0 DFD
CLASSROOM
LIVE FACES
LEVEL 0
RECOGNIZE FACES
DETECTED FACES
LEVEL 0
MARK ATTENDANCE
ATTENDANCE ENTRY
FACULTY
FACES DATABASE
LEVEL 1 DFD
CLASSROOM
LIVE FACES
LEVEL 1
DETECTS LIVE FACES
PRESENT FACES
LEVEL 1
ATTENDANCE MARKED IN SPREADSHEET
VIEWED BY
FACULTY
LEVEL 1
CAPTURE STUDENT IMAGES
CAMERA INPUT
LEVEL 1
MATCHING USING PCA
ATTENDANCE DATABASE
STUDENTS
STORES FACES
EXISTING FACES
OUTPUT
FACES DATABASE

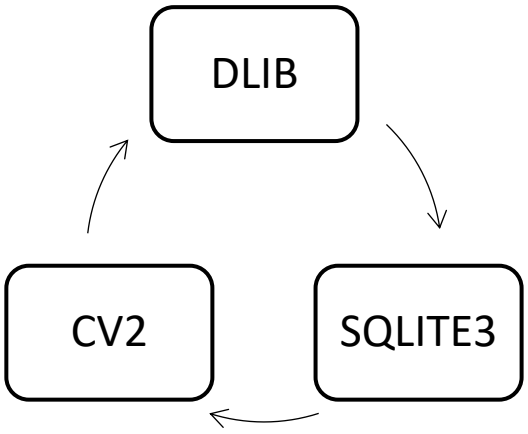
ER DIAGRAM


FIRST NAME
LAST NME
(NAME)
ID
STUDENT
STUDIES
FID
NAME
FACULTY
TEACHES
COURSE
COUIRSE ID
UPDATES
VIEWS
ATTENDANCE
RESULT
COURSE ID

MODULE 1: CAPTURING STUDENT IMAGES

- INPUTS STUDENT NAME AND ROLL NUMBER
- CAPTURES IMAGES
- CREATES A FILE WITH 20 IMAGES FOR ONE STUDENT

TECHNOLOGIES USED:

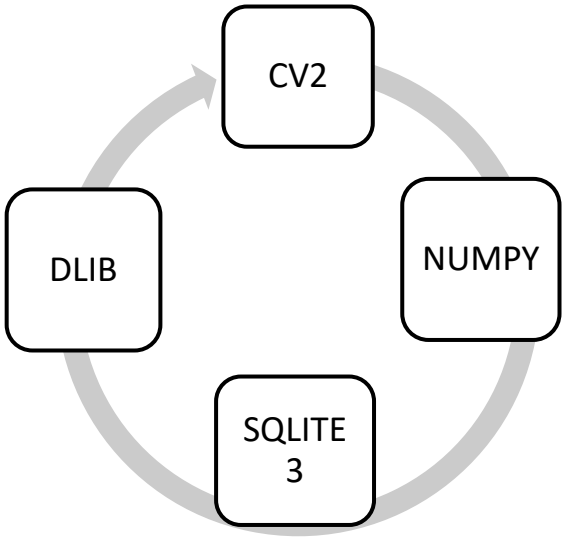


- DLIB - Dlib is a modern C++ toolkit containing machine learning algorithms and tools for creating complex software in C++ to solve real world problems.
- CV2 - OpenCV (Open Source Computer Vision) is a library of programming functions for realtime computer vision.
- Get_frontal_face – Detects the faces that is captured by the camera and stores it in detector variable.
- dets = detector(img,1) - Run the face detector, upsampling the image 1 time to find smaller faces.
- cv2.imread - The function imread loads an image from the specified file and returns it. If the image cannot be read (because of missing file, improper permissions, unsupported or invalid format), the function returns an empty matrix.
- cv2.imwrite – Saves image to the file

MODULE 2: DETECTING LIVE FACES

- CAPTURES CLASSROOM IMAGE.
- OUTPUTS STUDENT NAME AND ROLL NUMBER WHO ARE PRESENT
- INSERTS OR UPDATES THE DATABASE

TECHNOLOGIES USED:



- Sqlite3.connect – Provides a connection to the base.
- Insertorupdate() function adds the new student face with label to the database or edits the existing entries.

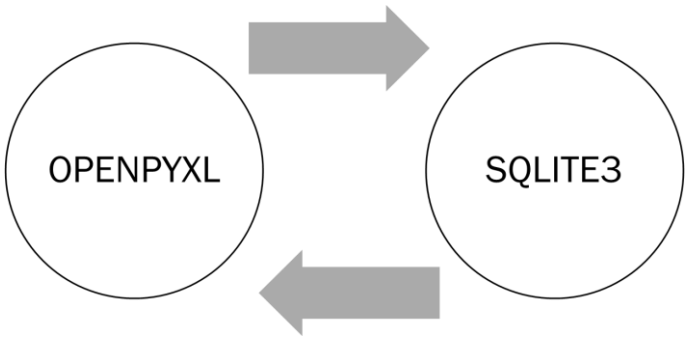
```
sampleNum = 0
while(True):
    ret, img = cap.read()
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    dets = detector(img, 1)
    for i, d in enumerate(dets):
        sampleNum += 1
        cv2.imwrite(folderPath + "/User." + Id + "." + str(sampleNum) + ".jpg",
                    img[d.top():d.bottom(), d.left():d.right()])
        cv2.rectangle(img, (d.left(), d.top())  ,(d.right(), d.bottom()),
                      (0,255,0) ,2) # Forming the rectangle
        cv2.waitKey(200)
    cv2.imshow('frame', img)
    cv2.waitKey(1)
    if(sampleNum >= 20):
        break

cap.release()
```

- cap.read() - Reading the camera input
- cv2.cvtColor() - Converting to GrayScale
- cap.release() - turning the webcam off

MODULE 3: SPREADSHEET

- DISPLAYS THE ATTENDANCE INFORMATION IN THE FORM OF ROW AND COLUMNS.
- OPENS A SPREADSHEET WITH 3 COLUMNS –
    - ROLL NUMBER
    - NAME
    - DATE
- STORES '1' IN THE DATE COLUMN IF THE STUDENT IS PRESENT ELSE IT LEAVES THE CELL BLANK

TECHNOLOGIES USED:



- Openpxly is python library for reading and writing Excel 2010 files.
- Openpxly along with sqlite3 is used for reading data from database and storing it in Excelsheets

CODE:

```
#creating worksheet and giving names to column
ws1 = wb.active
ws1.title = "Cse15"
ws1.append(('Roll Number', 'Name', currentDate))
ws1.append(('', '', ''))
```

```
#entering students information from database
while True:
    a = c.fetchone()
    if a == None:
        break
    else:
        ws1.append((a[2], a[1]))

#saving the file
wb.save(filename = dest_filename)
```