**IoT Lab Assignment - 6**

**Question-1)**

Given the following devices and resources available: One Raspberry-Pi board, One Pi-camera (*with ribbon connector*), one PIR sensor, a smart-phone, a number of jumper wires and a good quality Wi-Fi (internet) connection.

Design an **Intruder-Detection-System** for your home/office security which can do the following tasks as soon as the intruder (motion) is detected:

(1) The Pi-camera must take a photograph and Raspberry-pi must send this photograph to your personal email ID (Use the ID ***IoTexp6@gmail.com***, Password: ***IoTExp6***). [Assuming that sufficient light is available (ON) in your home/office and the photos can be captured].

(2) A pop-up message must be received on your smart-phone (connected to internet) showing the text: Alert!! somebody is in your house.

First, describe the connections part (very briefly, no diagram is needed) and then write an efficient Python code.

**Hint:** Refer to the ***“Exp-3: Home Security System using Raspberry Pi and PIR Sensor”*** and ***“Exp-6(b): Capturing an image with Pi-Camera and sending it to the email using SMTP server/protocol”***.

Connections are as follows-

**For the connection of PIR sensor to Raspberry Pi :**

* Connect GND of PIR to GND of Raspberry pi.
* Connect VCC of PIR to +5V of Raspberry pi
* Connect OUT PIR to Pin-11 of Raspberry pi.

**For Pi camera connection to Rasp pi :**

* The connector of camera is inserted into the camera slot in Raspberry Pi.

**CODE:-**

**import RPi.GPIO as GPIO**

**from datetime import datetime**

**import smtplib,ssl**

**from time import sleep**

**from pushbullet import pushbullet**

**from picamera import PiCamera**

**from email.mime.multipart import MIMEMultipart**

**from email.mime.base import MIMEBase**

**from email.mime.text import MIMEText**

**from email.utils import formatdate**

**from email import encoders**

**GPIO.setmode(GPIO.BOARD)**

**GPIO.setwarnings(False)**

**#PIR sensor**

**GPIO.setup(11, GPIO.IN)**

**pb = Pushbullet(''o.LnqIMa7DpmiNU13M2QW91SNOj3gDUY3E'')**

**#auth code**

**print(pb.devices)**

**camera = PiCamera()**

**def take\_picture():**

**camera.start\_preview()**

**sleep(1)**

**camera.capture('/home/pi/image.jpg')**

**camera.stop\_preview()**

**def send\_email():**

**address = '**[**test@gmail.com**](mailto:test@gmail.com)**'**

**me = '**[**IoTexp6@gmail.com**](mailto:IoTexp6@gmail.com)**'**

**subject = ''Alert!! somebody is in your house''**

**mesg = MIMEMultipart()**

**mesg['Subject'] = subject**

**mesg['From'] = me**

**mesg['To'] = address**

**mesg.preamble = ''''Alert!! somebody is in your house ''**

**part = MIMEBase('application', ''octet-stream'')**

**part.set\_payload(open(''image.jpg'', ''rb'').read())**

**encoders.encode\_base64(part)**

**part.add\_header('Content-Disposition','attachment;filename=''image.jpg''')**

**mesg.attach(part)**

**try:**

**s = smtplib.SMTP('smtp.gmail.com', 587)**

**s.ehlo()**

**s.starttls()**

**s.ehlo()**

**s.login(user = '**[**IoTexp6@gmail.com**](mailto:IoTexp6@gmail.com)**', password = 'IoTExp6')**

**s.sendemail(me, address, mesg. as\_string ())**

**s.quit()**

**except SMTPException as error:**

**print (''Error'')**

**while True:**

**inp = GPIO.input(11)**

**if inp == 0:**

**print (''no motion'')**

**sleep(1)**

**elif inp == 1:**

**print (''motion'')**

**dev = pb.get\_device(‘My Phone’)**

**push = dev.push\_note('' Alert!! somebody is in your house.'')**

**take\_picture()**

**send\_email()**

**sleep(1)**

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