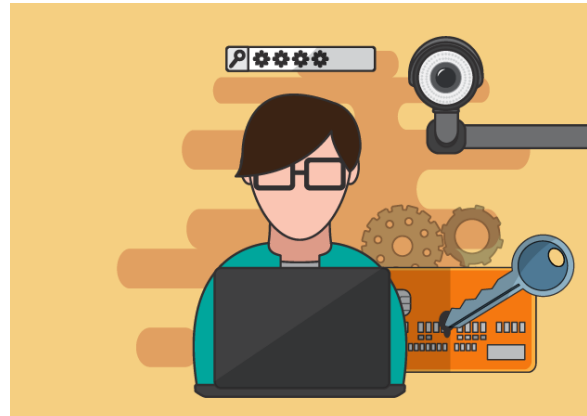## Security system using webcam

What is the GOAL for this MODULE?
The goal for this module is to explore python's OpenCV library.

What did we ACHIEVE in the class TODAY?
- We learned about uploading files to dropbox.
- We learned to take images using OpenCV library to access webcam and upload them on dropbox.

Which CONCEPTS/CODING BLOCKS did we cover today?
- Usage of the OpenCV library to capture images.
- Uploading images to dropbox.

How did we DO the activities?

We installed the open cv library on our system using python package manager.

```
$ pip3 install opencv-python
```

Then we saw the code to take pictures using the cv library and understood how it works. Imported cv2 and defined a take_snapshot function.

```python
1   import cv2
2
3   def take_snapshot():
4       #initializing cv2
5       videoCaptureObject = cv2.VideoCapture(0)
```

Declare the results variable and set it's value to true. We used a while loop.

```python
1   import cv2
2
3   def take_snapshot():
4       #initializing cv2
5       videoCaptureObject = cv2.VideoCapture(0)
6       result = True
7       while(result):
```

Used the read function to read the frames.

```
1    import cv2
2
3    def take_snapshot():
4        #initializing cv2
5        videoCaptureObject = cv2.VideoCapture(0)
6        result = True
7        while(result):
8            #read the frames while the camera is on
9            ret,frame = videoCaptureObject.read()
```

Used the imwrite function to save the image.

```
1    import cv2
2
3    def take_snapshot():
4        #initializing cv2
5        videoCaptureObject = cv2.VideoCapture(0)
6        result = True
7        while(result):
8            #read the frames while the camera is on
9            ret,frame = videoCaptureObject.read()
10           #cv2.imwrite() method is used to save an image to any storage device
11           cv2.imwrite("NewPicture1.jpg",frame)
```

Closed the camera and closed all the windows that were open.

```python
import cv2

def take_snapshot():
    #initializing cv2
    videoCaptureObject = cv2.VideoCapture(0)
    result = True
    while(result):
        #read the frames while the camera is on
        ret,frame = videoCaptureObject.read()
        #cv2.imwrite() method is used to save an image to any storage device
        cv2.imwrite("NewPicture1.jpg",frame)
        result = False

    # releases the camera
    videoCaptureObject.release()
    #closes all the window that might be opened while this process
    cv2.destroyAllWindows()
```

```python
import cv2

def take_snapshot():
    #initializing cv2
    videoCaptureObject = cv2.VideoCapture(0)
    result = True
    while(result):
        #read the frames while the camera is on
        ret,frame = videoCaptureObject.read()
        #cv2.imwrite() method is used to save an image to any storage device
        cv2.imwrite("NewPicture1.jpg",frame)
        result = False

    # releases the camera
    videoCaptureObject.release()
    #closes all the window that might be opened while this process
    cv2.destroyAllWindows()

take_snapshot()
```

Then we saw the usage of random and time modules in python.

```
ashura@zeros:~/Documents/c102$ python3
Python 3.8.2 (default, Apr 27 2020, 15:53:34)
[GCC 9.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import time
>>> import random
>>> print (time.time())
1591575871.1234708
```

```
>>> print(random.randint(0,9))
5
```

Then we wrote code to capture an image every 5 mins and upload it on dropbox.

```
import cv2
import dropbox
import time
import random
```

```python
start_time = time.time()

def take_snapshot():
    number = random.randint(0,100)
    #initializing cv2
    videoCaptureObject = cv2.VideoCapture(0)
    result = True
    while(result):
        #read the frames while the camera is on
        ret,frame = videoCaptureObject.read()
        #cv2.imwrite() method is used to save an image to any storage device
        img_name = "img"+str(number)+".png"
        cv2.imwrite(img_name, frame)
        start_time = time.time
        result = False
    return img_name
    print("snapshot taken")
    # releases the camera
    videoCaptureObject.release()
    #closes all the window that might be opened while this process
    cv2.destroyAllWindows()
```

We defined the upload function which would upload the file to dropbox.

```python
def upload_file(img_name):
    access_token = "riFu6Ybhc9AAAAAAAAAIJ_A5fl-EVHtEp33bdEjXapu5jLJLT38D6g_Hz25genB"
    file =img_counter
    file_from = file
    file_to="/newFolder1/"+(img_name)
    dbx = dropbox.Dropbox(access_token)

    with open(file_from, 'rb') as f:
        dbx.files_upload(f.read(), file_to, mode=dropbox.files.WriteMode.overwrite)
        print("file uploaded")
```
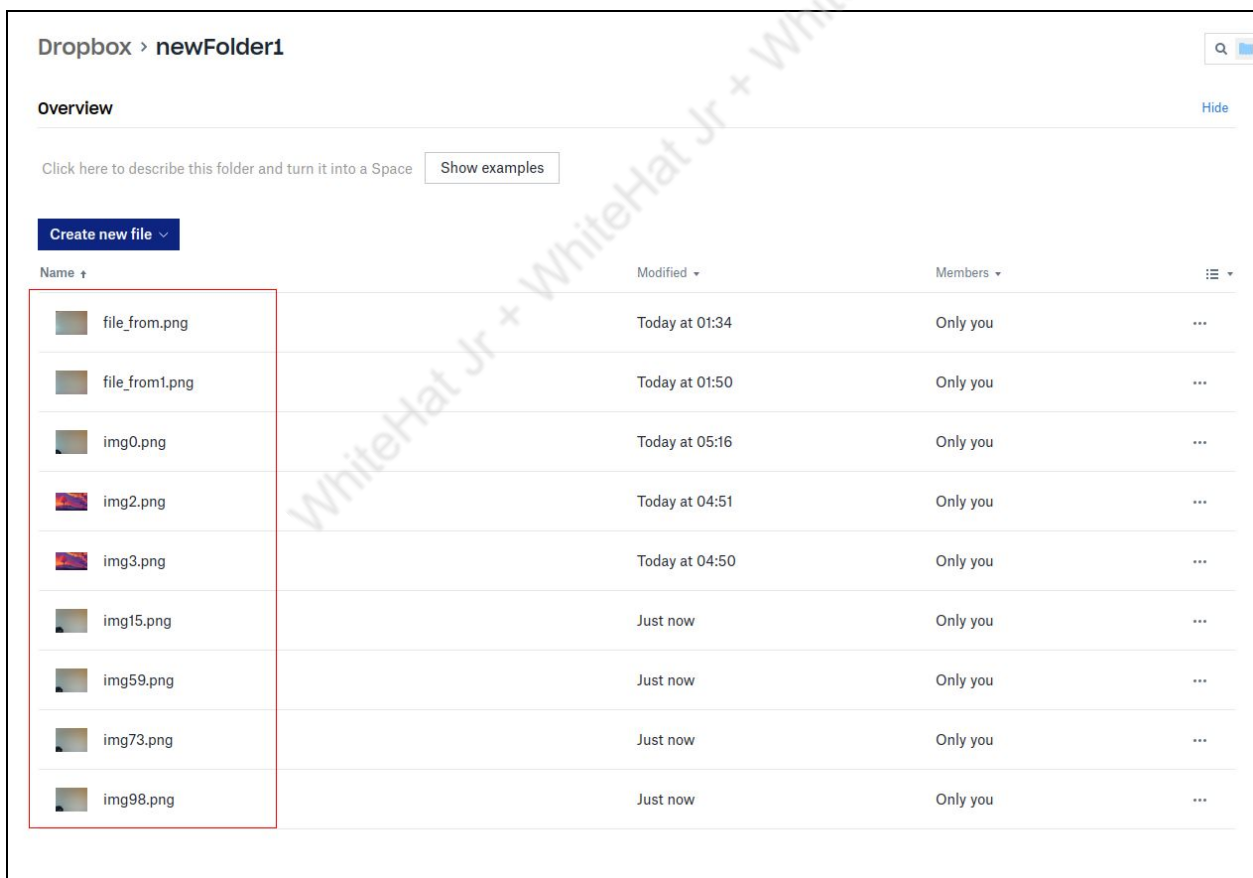
Defined the main function which would call the other two functions after every 5 mins.

```python
def main():
    while(True):
        if ((time.time() - start_time) >= 300):
            name = take_snapshot()
            upload_file(name)

main()
```

Then we checked the output.

What's NEXT?

In the next class, we will learn about data visualization. Our next class will be a capstone class so don't forget to bring your parents to the class.

Extend your knowledge:

You can read different types of operations using the open cv library.

https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_tutorials.html