Install cmake , dlib , face-recognition & pillow libraries

```
pip install cmake
```

```
Requirement already satisfied: cmake in /usr/local/lib/python3.10/dist-packages (3.27.4.1)
```

```
pip install dlib #machine learning lib
```

```
Requirement already satisfied: dlib in /usr/local/lib/python3.10/dist-packages (19.24.2)
```

```
pip install face-recognition
```

```
Collecting face-recognition
  Downloading face_recognition-1.3.0-py2.py3-none-any.whl (15 kB)
Collecting face-recognition-models>=0.3.0 (from face-recognition)
  Downloading face_recognition_models-0.3.0.tar.gz (100.1 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 100.1/100.1 MB 10.1 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Requirement already satisfied: Click>=6.0 in /usr/local/lib/python3.10/dist-packages (from face-recognition) (8.1.7)
Requirement already satisfied: dlib>=19.7 in /usr/local/lib/python3.10/dist-packages (from face-recognition) (19.24.2)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from face-recognition) (1.23.5)
Requirement already satisfied: Pillow in /usr/local/lib/python3.10/dist-packages (from face-recognition) (9.4.0)
Building wheels for collected packages: face-recognition-models
  Building wheel for face-recognition-models (setup.py) ... done
  Created wheel for face-recognition-models: filename=face_recognition_models-0.3.0-py2.py3-none-any.whl size=100566171 sha256=475c730177f1f5c01ae67d57d89210fc59c0d9e95707aa0d249e5e0aab823c73
  Stored in directory: /root/.cache/pip/wheels/7a/eb/cf/e9eced74122b679557f597bb7c8e4c739cfcac526db1fd523d
Successfully built face-recognition-models
Installing collected packages: face-recognition-models, face-recognition
Successfully installed face-recognition-1.3.0 face-recognition-models-0.3.0
```

```
pip install pillow
```

```
Requirement already satisfied: pillow in /usr/local/lib/python3.10/dist-packages (9.4.0)
```

Import

```
import face_recognition as FaceRec
```

```
import PIL.Image as MyPilImag
```

```
import PIL.ImageDraw as MyPilImagDraw
```

Upload pic from System

```
from google.colab import files
uploaded = files.upload()
```

```
Choose Files school.jpg
• school.jpg(image/jpeg) - 233357 bytes, last modified: 10/16/2021 - 100% done
Saving school.jpg to school.jpg
```

Load Image to Numpy Array!

```
ImgArry= FaceRec.load_image_file("school.jpg")
```

location of faces in image!

```
face_locations = FaceRec.face_locations(ImgArry)

for face in face_locations:

    top = face[0]
    right = face[1]
    bottom = face[2]
    left = face[3]
    print(f"Top : {top} , Right : {right} , Bottom : {bottom} , Left :{left}")
```

```
 Top : 76 , Right : 852 , Bottom : 166 , Left :763
 Top : 36 , Right : 613 , Bottom : 126 , Left :524
 Top : 175 , Right : 187 , Bottom : 283 , Left :79
 Top : 140 , Right : 689 , Bottom : 247 , Left :581
 Top : 223 , Right : 927 , Bottom : 331 , Left :820
 Top : 216 , Right : 305 , Bottom : 305 , Left :215
```

Load pillow image from Numpy array

```
pillowImg = MyPilImag.fromarray(ImgArry)
```

Draw rectangle around detected faces

```
n =1
for face_loc in face_locations:
    top  , right  , bottom , left = face_loc
    print(f"Top : {top} , Right : {right} , Bottom : {bottom} , Left : {left}")
    Draw = MyPilImagDraw.Draw(pillowImg)
    Draw.rectangle([right , top , left , bottom ] , outline = "red" ,width = 5)
```

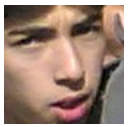
```
 Top : 76 , Right : 852 , Bottom : 166 , Left : 763
 Top : 36 , Right : 613 , Bottom : 126 , Left : 524
 Top : 175 , Right : 187 , Bottom : 283 , Left : 79
 Top : 140 , Right : 689 , Bottom : 247 , Left : 581
 Top : 223 , Right : 927 , Bottom : 331 , Left : 820
 Top : 216 , Right : 305 , Bottom : 305 , Left : 215
```

Save and Show It!

```
display(pillowImg)
```

Split and save each face in dedicated image file

```
faceImg = ImgArry[top:bottom , left : right]
PillImg = MyPilImag.fromarray(faceImg)
display(PillImg)
PillImg.save("face_"+str(n)+".jpg")
n= n+1
```



Detecting face landmarks (facial features)

```
from google.colab import files
uploaded = files.upload()
```

Choose Files me_2021.jpg

- **me_2021.jpg**(image/jpeg) - 41162 bytes, last modified: 10/12/2021 - 100% done

```
Saving me_2021.jpg to me_2021.jpg
```

```
from PIL import Image, ImageDraw
import face_recognition

# Load Images
```

```
ImageArray = face_recognition.load_image_file("me_2021.jpg")

# Find All the facial features in all faces in the Images
face_landmark_List = face_recognition.face_landmarks(ImageArray)

# Load Pillow Images from Numpy Arrays
PillImg = Image.fromarray(ImageArray)
Draw = ImageDraw.Draw(PillImg)

# Iterate through detected faces
for face_landmarks in face_landmark_List:
    # Print the name of each facial feature in this image
    for facial_feature in face_landmarks.keys():
        print("Feature Name:", facial_feature)

    # Draw each facial feature in the image with a line
    for facial_feature, points in face_landmarks.items():
        Draw.line(points, width=5, fill="white")

    # Display the image with the facial features
    display(PillImg)
```

```
Feature Name: chin
Feature Name: left_eyebrow
Feature Name: right_eyebrow
Feature Name: nose_bridge
Feature Name: nose_tip
Feature Name: left_eye
Feature Name: right_eye
Feature Name: top_lip
Feature Name: bottom_lip
```

Add rouge makeup

```
import face_recognition as FaceRec
import PIL.Image as MyPilImag
import PIL.ImageDraw as   MyPilImagDraw
```

```
#lOAD IMAGE
ImageArray = FaceRec.load_image_file("me_2021.jpg")
#FIND ALL THE FEATURES IN ALL THE FACES IN THE IMAGES
face_landmark_List = FaceRec.face_landmarks(ImageArray)

#--------Load images from numpy array
PillImg = MyPilImag.fromarray(ImageArray)

#-------------
Draw = MyPilImagDraw.Draw(PillImg , "RGBA")
```

```
for face_landmarks in face_landmark_List:
    #add rouge makeup for lip !
    Draw.polygon(face_landmarks["top_lip"] , fill = (150, 0, 0, 64))
    Draw.polygon(face_landmarks["bottom_lip"] , fill = (150, 0, 0, 64))

    #Draw lines !
    #Draw.line(face_landmarks["top_lip"] , fill = (150, 0, 0, 30) , width = 2)
    #Draw.line(face_landmarks["bottom_lip"] , fill = (150, 0, 0, 30) ,width = 2)

    #Add thicker Eyesbrows !
    Draw.polygon(face_landmarks["left_eyebrow"] , fill = (68, 54, 39, 128))
    Draw.polygon(face_landmarks["right_eyebrow"] , fill = (68, 54, 39, 128))

    #Add eyeliner! (soja muzzamil ab baki kl yahin sy kr lena-----nhi mai yyh pura kr k sounga)
    Draw.line(face_landmarks["left_eye"] , fill = (0, 0, 0, 110) , width = 2)
    Draw.line(face_landmarks["right_eye"] , fill = (0, 0, 0, 110) , width = 2)

    #add sparkle !
    Draw.polygon(face_landmarks["left_eye"] , fill = (225, 225, 225, 90))
    Draw.polygon(face_landmarks["right_eye"] , fill = (225, 225, 225, 90))

    display(PillImg)
```

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