Install opencv-contrib-python

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https://pypi.org/project/opencv-contrib-python/

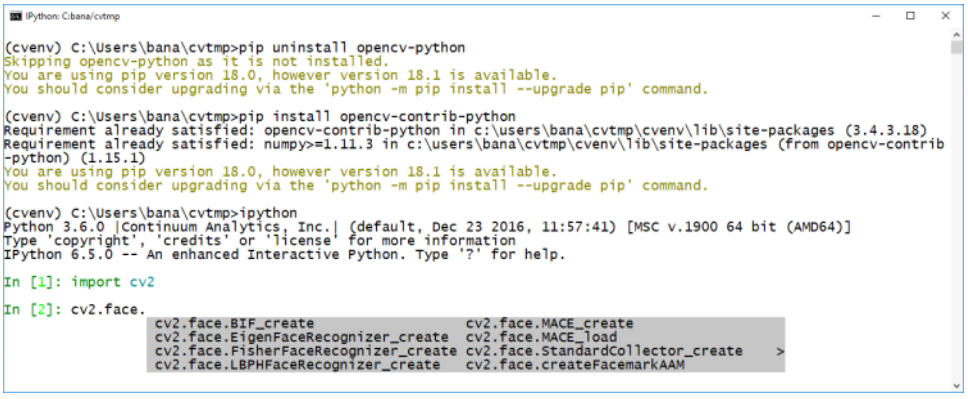
Terdapat 4 jenis pustaka opencv dalam python:

1. Opencv-python : berisi libraries opencv bagian module utama (Main Modules) saja.
2. **Opencv-contrib-python: module utama (Main modules) + modul ekstra (extras modules)**
3. Opencv-python-headless:
4. Opencv-contrib-python-headless:

Uninstall opencv-python: > pip uninstall opencv-python
Install opencv-python: > pip install opencv-contrib-python

Note: sebaiknya tidak menginstalll lebih dari dua tipe

Daftar modul (**Main modules** dan **Extras modules**) library dalam opencv dapat dilihat pada link berikut:
https://docs.opencv.org/master/



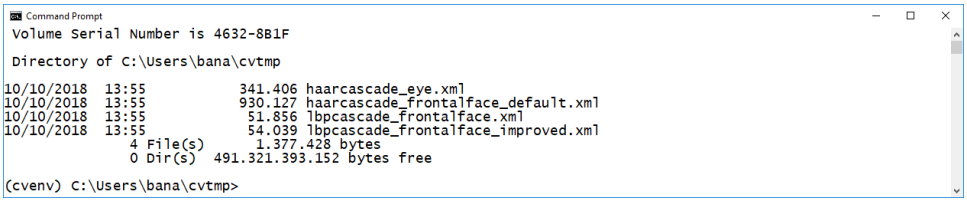
Face detection menggunakan LBP:

```
lbp_face_cascade = cv2.CascadeClassifier('lbpcascade_frontalface.xml')
```

Note: perbedaan dengan haar face detection terletak pada xml file, LBP Face Detection menggunakan file "lbpcascade_frontalface.xml", dapat didownload dari opencv source-code di github.com

https://github.com/opencv/opencv/tree/master/data/lbpcascades

- Download tile tersebut dan simpan dalam direktori kerja (C:\users\bana\cvtmp \lbpcascade_frontalface.xml)




```
import numpy as np
import cv2

lbp_face_cascade = cv2.CascadeClassifier('lbpcascade_frontalface.xml')

eye_cascade = cv2.CascadeClassifier('haarcascade_eye.xml')
img = cv2.imread('sachin.jpg')
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
faces = lbp_face_cascade.detectMultiScale(gray, 1.3, 5)
for (x,y,w,h) in faces:
    img = cv2.rectangle(img,(x,y),(x+w,y+h),(255,0,0),2)
    roi_gray = gray[y:y+h, x:x+w]
    roi_color = img[y:y+h, x:x+w]
    eyes = eye_cascade.detectMultiScale(roi_gray)
    for (ex,ey,ew,eh) in eyes:
        cv2.rectangle(roi_color,(ex,ey),(ex+ew,ey+eh),(0,255,0),2)
cv2.imshow('img',img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

Contoh kode dan gambar untuk membandingkan Haar dan LBP face detection:
https://github.com/informramiz/Face-Detection-OpenCV

Link contoh perbandingan algoritma menganali wajah (Face Recognizer)

- EigenFace
- FisherFace
- LBPH

https://github.com/informramiz/opencv-face-recognition-python