Section 1

GrayScale → white → Strong intensity
→ black → weak intensity

object detection → location of object
object Recognition → object in image, position
object classification → Category of object
object segmentation → pixels belog to object

} open CV job

Python → Interpreted (parse line-by-line)
→ dynamically Typed → no define data type
var = "hello"
→ Strongly typed
JS → 1 + "2" = "12" Implicit Convesion
python → 1 + "2" = error ✗ Implicit

l1 = [1,2,3]
l1 * 2 = [1,2,3,1,2,3]

Install numpy
① Python -m pip install --upgrade pip
② pip install numpy

numpy
① array = numpy.array([[1,2,3],[4,5,6]]) ⇒ 2 row, 3 Cols
1 2 3
4 5 6

② array values from 0 → 11 (12) 3 row 4 Cols

arr = numpy.arrange(12).reshape(3,4)
0 → 11 rows Cols

Image channel
1 → grayscale
3 → RGB

/ /

arr.size → num of items in array
arr.shape → (row , col)
arr.ndim → how many dimensions
arr.dtype.name → type of variable in array
arr.itemsize → one array element size in **bytes**

openCV-python → main modules
openCV-contrib-python → full package

Img of zeros (3X3) = img = numpy.zeros(3,3, type=np.unit8)
Convert Img to RGB = CV_2.cvtColor(grayscale img, CV_2.Color_Gray2BGR)

Img.shape → row, coloumn, number of channels
RGB → 3
Grayscale → مش هترجع حاجة
لأن ال 1 = def.

Imread() → load img from specified file
CV2.imread(filename, mode of img read)

CV_2.ImRead_Color → 3 channel RGB
" " _GrayScale → 8 bit GrayScale
_AnyColor → 8 bit / channel < RGB, GScale
_unchanged → read all img data include alpha

imShow → show img
CV2.waitkey(num of seconds) → عشان ال window تتأخر
CV2.destroyAllWindows() → اقفل ال window

/ /

Cont Mode of read

① .Anydepth ⟶ grayscale + original bit depth

② .anydepth | .Imread_Color ⟶ RGB + Bit depth

③ IMRead_Reduced_GrayScale_2 ⟶ قلل جودة الصورة للنص

_GrayScale_4 ⟶ للربع

_GrayScale_8 ⟶ للثمن

_Color_8 ⟶ صورة ألوان قللها للثمن

Image writing

imwrite (Image name + extension , Variable) ⟶ Same directory

imwrite(r' Path' , Variable)

byte ⟶ range ⟶ 0 ⟶ 255

Reshape

X = bytearray(os.urandom(100)) ⟶ Array byte
فيها ١٠٠ قيمة Random

.reshape(row, Col

فرق بين الـ 3 ⟹ numpy.random.randint(Stat, end, Values) عدد
numpy

/ / Path

read video → cv2. videoCapture( )

get fps → video .get(cv2. CAP_Prop_Fps)

size → .get(cv2 . CAP_ prop_ Frame_width),
" " " " highet

video ⇒ cv2. VideoWriter (name, cv2. Videowriter (I,4,2,0) ,Fps ,size)

VideoWriter_fourcc

1. I,4,2,0 → unCompressed YUV 4:2:0 .avi
2. P,I,M,1 → mpeG 1 .avi
3. X,V,I,D → Limit size Mpeg_4 .avi اوحش
4. m,P,4,V → " " " " " احسن
5. X,2,6,4 → " " " " " احسن في الsize
6. T h e o → ogg Vorbis .ogv
7. F l V 1 → Flash video .FlV

video
open Camera → cv2. VideoCapture (0)