

```
import os
```

```
import glob
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

```
import cv2
```

```
from numpy.core.fromnumeric import size
```

```
from numpy.lib.npyio import savetxt
```

```
#First you've to save your videos in folders named with the same prefix, in the  
same folder as this code
```

```
#Example: Folder #1:"Example1", Folder #2:"Example2",..., Folder  
#12:"Example12", ...
```

```
#Everything you can change to adapt the values to get the better results for you  
are commented and explained
```

```
pastas=glob.glob('Example*') #Now you've to put your prefix plus an * (instead  
of 'Example'). The * will make the code read all folders that have the prefix that  
you choose.
```

```
for pasta in pastas:
```

```
    local=os.path.join(pasta,'*.jpg')
```

```
    imagem=glob.glob(local)
```

```
    i=0
```

```
    p=[]
```

```
    z=[]
```

for i in imagem:

```
    frame=cv2.imread(i, cv2.IMREAD_GRAYSCALE)
```

brancos=np.sum(frame>=50) #50 means that the program will read all the pixels with values bigger than this. You can change if you want just the lighter pixels

```
    p.append(brancos)
```

```
re=[]
```

for i in p:

```
    j=i-min(p)
```

```
    re.append(j)
```

for i in imagem:

```
    f=os.path.basename(i)
```

```
    nframe=int(f.split(".")[0])
```

```
    z.append(nframe)
```

```
t=[]
```

```
t=zip(z,re)
```

```
t=sorted(t, key=lambda par:par[0])
```

```
x,y=zip(*t)
```

```
hi=[]
```

for z,re in t:

```
    if re>=5:
        hi.append((z,re))

ok=hi[0]
inicio, lum=ok
iniRai='start:'+str(inicio)
bye=hi[-1]
fim, lumi=bye
fimRai='end:'+str(fim)

fig, ax = plt.subplots()
ax.plot(x,y)
ax.set_title(pasta) #The graph will have the name of video folder
ax.set_xlabel('Frames')
ax.set_ylabel('Pixels - values: 50-255 (Grayscale)')
ax.grid(True)

    ax.text(2000, 120000, iniRai, color='red') #2000 and 120000 are the
coordinates of the print with the informations about begining of lightning, you can
change if this coordinates are not good in your graph

    ax.text(2000, 110000, fimRai, color='blue') #2000 and 120000 are the
coordinates of the print with the informations about end of lightning, you can
change if this coordinates are not good in your graph

plt.savefig('graph'+pasta+'.jpeg')

plt.close()
```