In [115…
```python
import cv2
import numpy as np
import sys
import matplotlib.pyplot as plt
# impotar imagen
# ====================================
img = cv2.imread('images.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(img)
print(img.shape)
```

(148, 340, 3)



In [116…
```python
img.shape
```

Out[116… (148, 340, 3)

In [117…
```python
def binary(img,umbral):
    alto = img.shape[0]
    ancho = img.shape[1]
    binary = np.zeros((alto, ancho, 3))
    gray = np.zeros((alto, ancho, 3))
    for i in range(0, alto):
        for j in range(0, ancho):
            pixel = img[i,j]
            gray[i,j]=pixel.mean()
            if pixel.mean() > umbral:
                binary[i,j] = 255

    return(binary.astype(int),gray.astype(int))
```

In [139…
```python
u=120   # umbral
im_bin,im_gray=binary(img,u)
```

In [145…
```python
fig, axs = plt.subplots(1,2, figsize=(35, 10))
axs[0].set_title('Imagen en escala de grises',fontsize=25)
axs[0].imshow(im_gray, origin='upper')
axs[1].set_title('Imagen binarizada',fontsize=25)
axs[1].imshow(im_bin, origin='upper')

plt.show()
```

In [ ]: