SOC Assignment-1

Dive into Digital image processing

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Code:-

```python
import numpy as np

from PIL import Image


# Make sure that the image you want to get output from is present

# in the same folder as the python file. Run this code using different images too :)

image_name = "WIN_20230326_10_12_27_Pro.png"


# Open the image file

img = Image.open(image_name)


# Convert the image to a numpy array and extract the grayscale values  (ravel() extracts the grayscale values )

img_array = np.array(img)

gray_values = img_array.ravel()

# Now numpy array gray_values contains gray value of each pixel.


##### TO DO #####


# Using Introduction.py see If image contains all pixel values are zero or not.

# Convert the given black image (Image is black because all grayscale values are near to zero) into

# img_stretched so that our eyes can see what's actually there in the image.

# This process is a real life application in Biology using Digital Image Processing.

# Change something in img_array :)

# Run your code with given 3 images by changing Image name in the code.


# HINTS

# 1. Increase the contrast (Read last week theory- Histogram Stretching)

# 2. min_value = np.min(gray_values) - This gives minimum value from the numpy array gray_values. Similarly you can find maximum value :)


# ACTIVITY

# I have given three images a.png, b.png, c.png. The time order of taking this image is as follows:

# a.png b.png c.png

#  t   t+T  t+2T

# Can you guess process?


#yes,the process is cell division.


#### WRITE YOUR CODE HERE ####

#histogram stretching
```

```
min_value = np.min(gray_values)

max_value = np.max(gray_values)

stretched_values = ((gray_values - min_value) / (max_value - min_value)) * 255


# Reshape the stretched values back into the shape of the original image

stretched_array = np.reshape(stretched_values, img_array.shape)


############# END ############


# Convert the numpy array back to an image

img_stretched = Image.fromarray(np.uint8(stretched_array))

img_stretched.save(f"final-{image_name}")
```
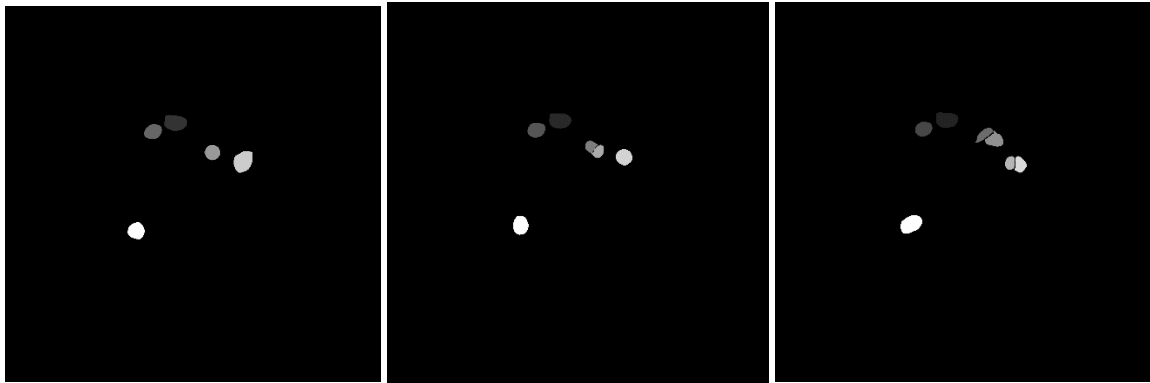

Can be clearly seen it is cell division.