How to present an image in the SSD1306 display

tree.png

Assuming you have an image called tree.png and you want to display it on the ssd1306.

1. Edit this image in a graphic editor such as paint.
2. Resize the image to 128 x 64 pixels.
   This will fill the entitle screen which have a resolution of 128 x 64 pixels.
3. Save this edited file as, say, tree.png

Before we can display it, we need to convert the image into a bytearray

I ask Chatgpt
What is a bytearray?

You
what is a Python bytearray

< 2 / 2 >

ChatGPT
A Python bytearray is a mutable sequence of bytes. It's similar to Python's built-in `bytes` data type, but unlike `bytes`, which is immutable, `bytearray` allows you to modify its elements. You can create a `bytearray` from a string, iterable of integers, or even directly from another `bytearray` object. It provides methods to manipulate the bytes it contains, such as appending, extending, inserting, removing, and modifying individual elements. This makes it useful for scenarios where you need to work with mutable sequences of bytes, such as in networking, file I/O, or low-level data manipulation tasks.

If you are as confused as I am it's ok. For the time being take it as just a representation of our image tree.png for our program

```
tree=bytearray(b'\x00\x00\x00
```

So that we can plunk it into a program like this.

[imageinssd1306.py]

```
1  from machine import Pin, I2C
2  import framebuf
3  #SSD1306 Library
4  from ssd1306 import SSD1306_I2C
5  #Set up ssd1306
6  WIDTH =128
7  HEIGHT= 64
8  i2c_bus=I2C(0,scl=Pin(17),sda=Pin(16),freq=200000)
9  oled = SSD1306_I2C(WIDTH,HEIGHT,i2c_bus)
10
11 tree=bytearray(b'\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x1c\x00\x
12
```

This is the bytearray representing the image tree.png

How to convert an image into a bytearray?

We need to use this program to convert. img2bytearray.py (inside lesson folder)

Credit:This program is created by novaspirit. See this link for more info.
https://www.youtube.com/watch?v=YR9v04qzJ5E&t=593s
img2bytearray.py is also available via this github link
https://github.com/novaspirit/img2bytearray

To save you the trouble of downloading it I have a copy of this file in the lesson folder.

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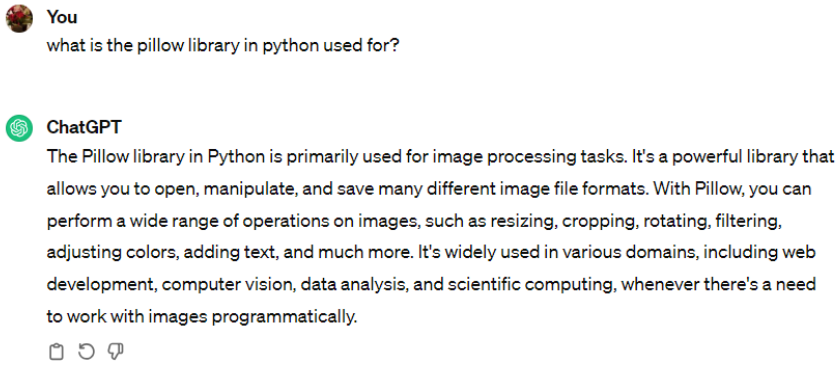
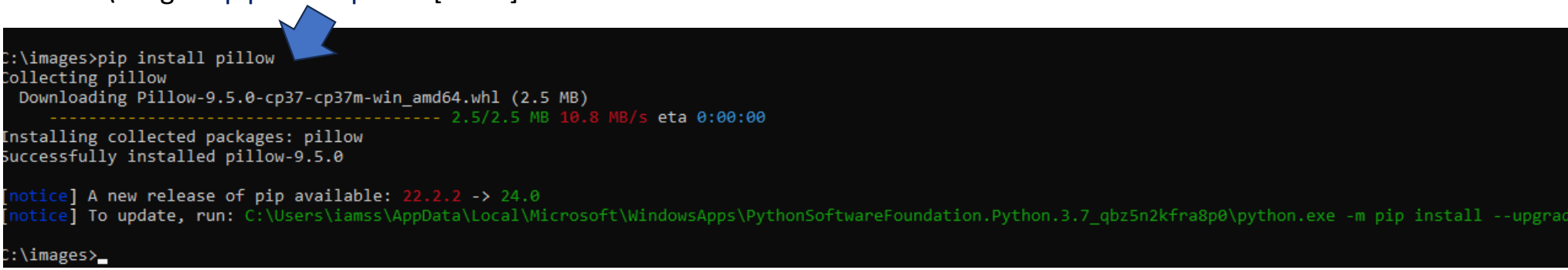
img2bytearray.py is a python3 program so we need to run it on
the PC where python3 is installed and not on Thonny.

I will show you how this is done.

These are the steps you need to follow to create the bytearray

1. In your c drive root directory, create a folder. Name it images
2. Copy and paste img2bytearray.py to this folder
3. Copy and paste the image (tree.png) to this folder
4. Open the terminal / command prompt.
5. CD to this folder
6. C:\images>
7. We need to install an image processing library called pillow. To install do this.
8. C:\images> pip install pillow [enter]





Now that pillow library and img2bytearray.py is setup in c:\images
We are ready to start converting our image file to bytearray.
Type this:
C:\images> python3 ./img2bytearray.py ./tree.png 128 64

This is a python3 program and requires python3 to run

./ = the folder the programs are in
img2bytearray.py is the conversion program
tree.png is the image file name
128 64 is the resolution we are using for this image

Hit Enter to run and you will see this on your terminal. Copy the lines starting from b" to the last line "

```
b"\x00\x00\x00
```

[imageinssd1306.py]

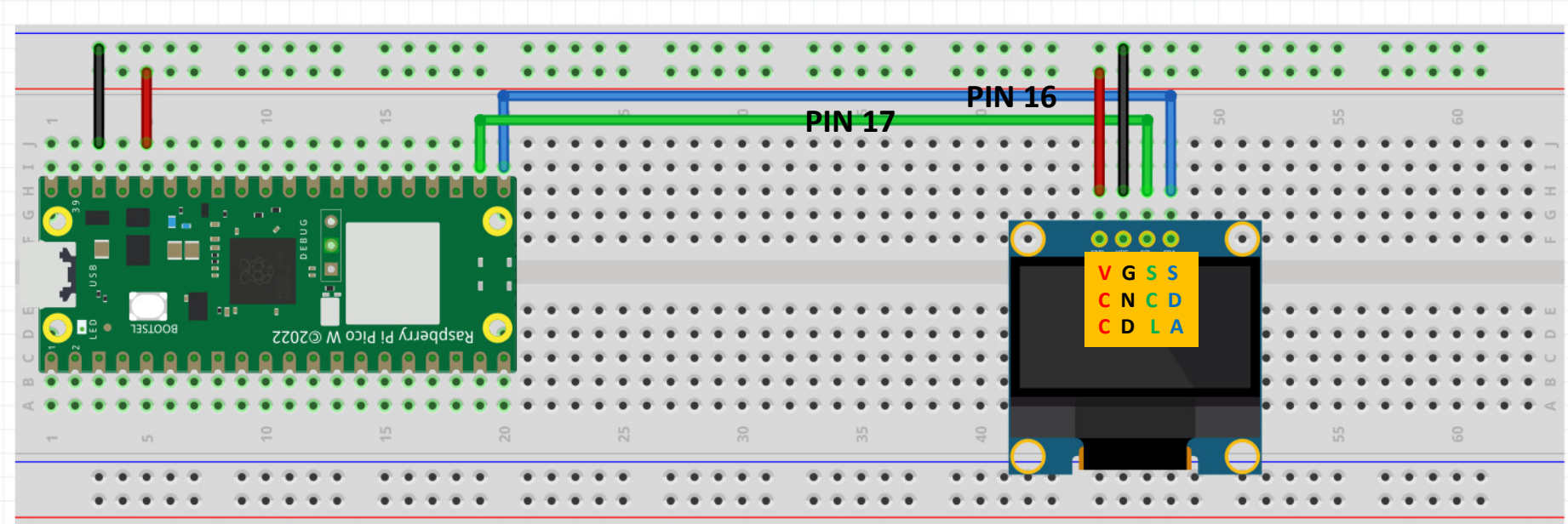
```
1  from machine import Pin, I2C
2  import framebuf
3  #SSD1306 Library
4  from ssd1306 import SSD1306_I2C
5  #Set up ssd1306
6  WIDTH =128
7  HEIGHT= 64
8  i2c_bus=I2C(0,scl=Pin(17),sda=Pin(16),freq=200000)
9  oled = SSD1306_I2C(WIDTH,HEIGHT,i2c_bus)
10
11 tree=bytearray(b'\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x1c\x00\x
12
```

To be copied and pasted here from the text editor.
It’s better to do like this.
tree=bytearray()
then paste the super long string in between the ()

[main.py] *

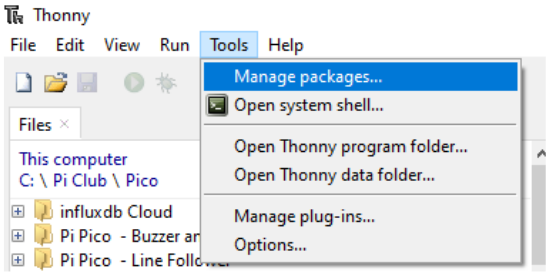
```
from machine import Pin, I2C
import framebuf
#SSD1306 Library
from ssd1306 import SSD1306_I2C

#Set up ssd1306
WIDTH =128
HEIGHT= 64
i2c_bus=I2C(0,scl=Pin(17),sda=Pin(16),freq=200000)
oled = SSD1306_I2C(WIDTH,HEIGHT,i2c_bus)

#set up bytearrays for the images to be displayed
tree=bytearray(b'\x00\x00\x00
```

Wiring of SSD1306

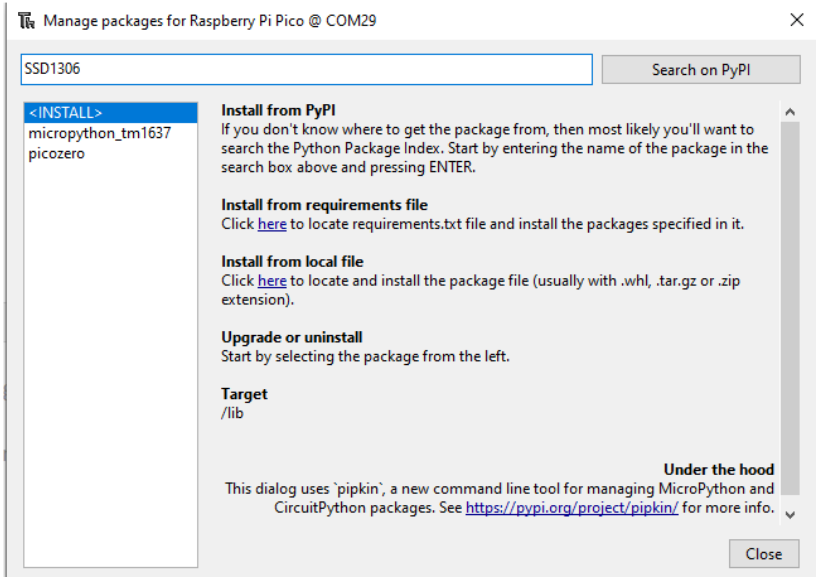


You will need to install the ssd1306 library.
Installation step is available in next slide

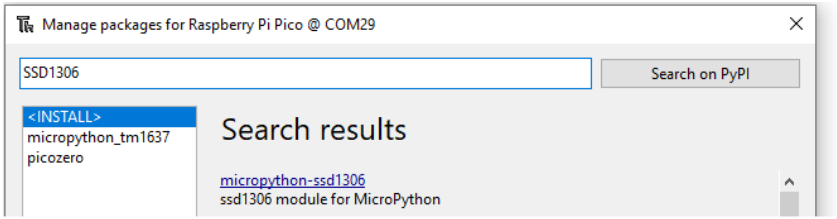
Step 1 – Go to Tools and Manage packages



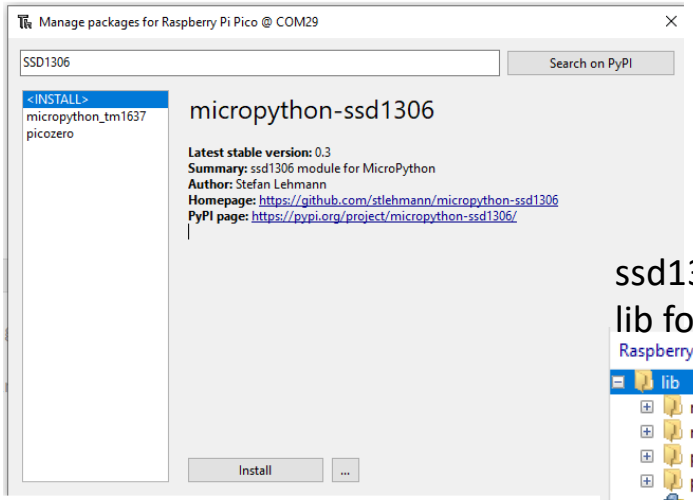
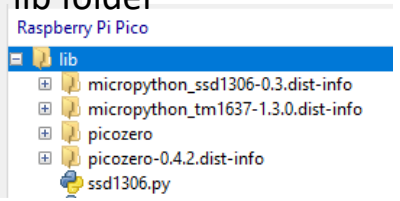
Step 2 – Type SSD1306 in search box, click search



Step 3 – Select micropython-ssd1306



Step 4 – Click Install.



ssd1306 will show up in your lib folder