

Raspberry Pi

完全に理解した

@unsoluble_sugar

2020/08/27 完全に理解した人達の「〇〇完全に理解したTalk」#8

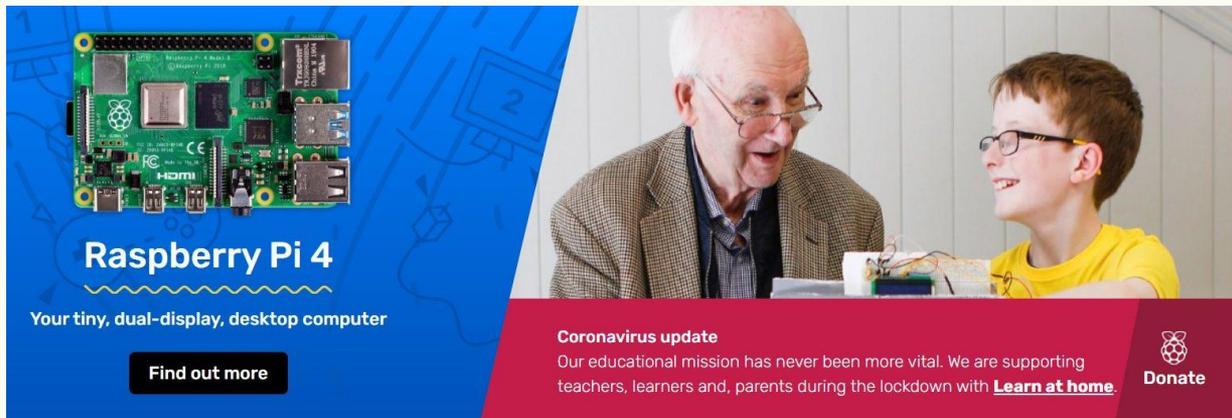
Raspberry Piとは

- ❑ 通称「ラズパイ」
- ❑ イギリスのラズベリーパイ財団が開発
- ❑ 小型のシングルボードコンピューター
- ❑ 1枚の回路基板上に最低限の機能



Raspberry Piとは

- ❑ 学校教育用を目的として開発
- ❑ モデルやスペックにも寄るが基本数千円と安価
- ❑ 2012年発売。累計売上台数: 3,000万台(2019年12月14日時点)



The image is a promotional banner for the Raspberry Pi 4. On the left, a green Raspberry Pi 4 board is shown against a blue background with faint circuit patterns. Below the board, the text reads "Raspberry Pi 4" in white, followed by "Your tiny, dual-display, desktop computer" in a smaller font. A black button with white text says "Find out more". On the right, a photograph shows an elderly man with glasses and a young boy with glasses, both smiling and looking at a small electronic project on a table. Below the photo, a red banner contains the text "Coronavirus update" and "Our educational mission has never been more vital. We are supporting teachers, learners and, parents during the lockdown with [Learn at home](#)". The Raspberry Pi logo and the word "Donate" are in the bottom right corner.

Raspberry Pi 4
Your tiny, dual-display, desktop computer

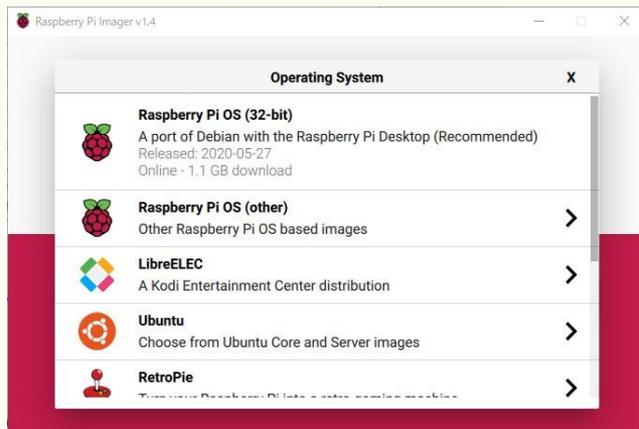
[Find out more](#)

Coronavirus update
Our educational mission has never been more vital. We are supporting teachers, learners and, parents during the lockdown with [Learn at home](#).

 **Donate**

Raspberry Piとは

- ❑ Raspberry Pi OS (旧称: Raspbian)
- ❑ Linuxディストリビューションのひとつ、Debianベース
- ❑ UbuntuやWindows 10 (IoT Core, ARM版)などもインストール可



複数のモデル・バージョンが存在

Model A

- ❑ Raspberry Pi Model A(2013年2月)
- ❑ Raspberry Pi 1 Model A+(2014年11月)
- ❑ Raspberry Pi 3 model A+(2018年11月)

Zero

- ❑ Raspberry Pi Zero(2015年11月)
- ❑ Raspberry Pi Zero W(2017年2月)
- ❑ Raspberry Pi Zero WH(2018年1月)

Model B

- ❑ Raspberry Pi 1 Model B(2012年2月)
- ❑ Raspberry Pi 1 Model B+(2014年7月)
- ❑ Raspberry Pi 2 Model B(2015年2月)
- ❑ Raspberry Pi 3 Model B(2016年2月)
- ❑ Raspberry Pi 3 Model B+(2018年3月)
- ❑ Raspberry Pi 4 Model B(2019年6月)

最新はRaspberry Pi 4(2020年8月時点)



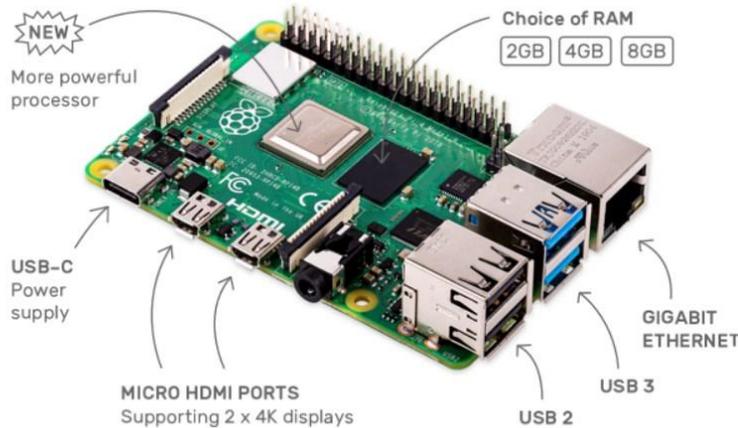
Raspberry Pi 4

Your tiny, dual-display, desktop computer
...and robot brains, smart home hub, media centre,
networked AI core, factory controller, and much more

[Buy a Raspberry Pi 4 Model B – Raspberry Pi](#)

電源はUSB Type-Cに。メモリ8GBモデルも

Completely upgraded, re-engineered
Faster, more powerful



From **\$35**

You'll recognise the price along with the basic shape and size, so you can simply drop your new Raspberry Pi into your old projects for an upgrade; and as always, we've kept all our software backwards-compatible, so what you create on a Raspberry Pi 4 will work on any older models you own too.

[Buy a Raspberry Pi 4 Model B – Raspberry Pi](#)

Raspberry Piのセットアップ

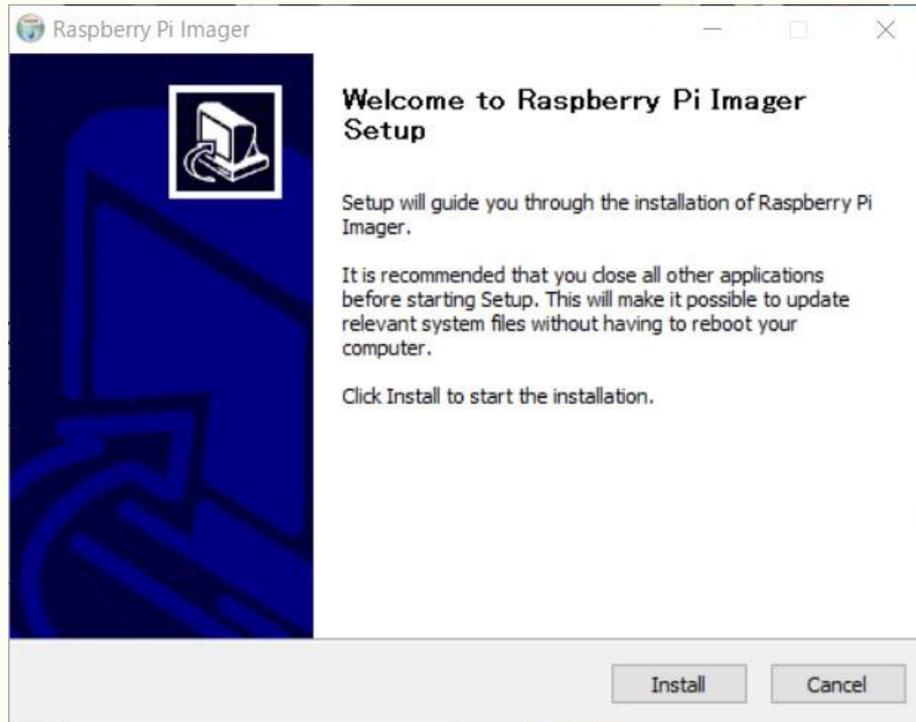
OS未インストールの場合

- ❑ microSDカードのフォーマット
- ❑ Raspberry Pi Imagerのダウンロード
- ❑ OSインストール

[Raspberry Pi Downloads - Software for the Raspberry Pi](#)



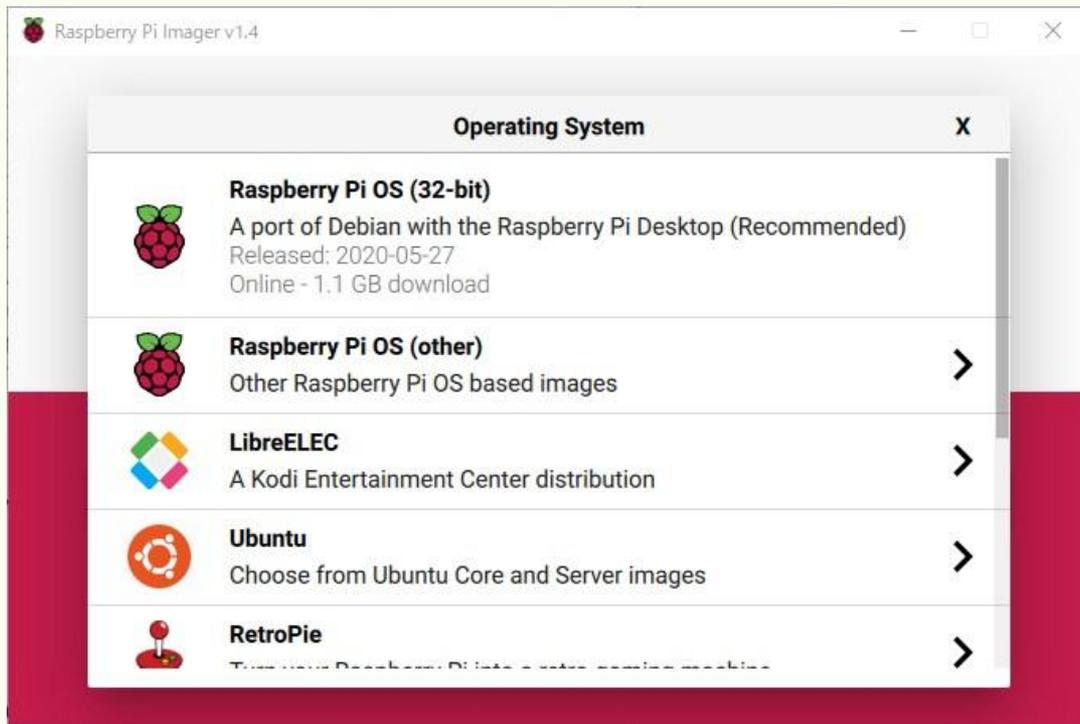
microSDカードのフォーマット



Raspberry Pi Imager



OSイメージのインストール

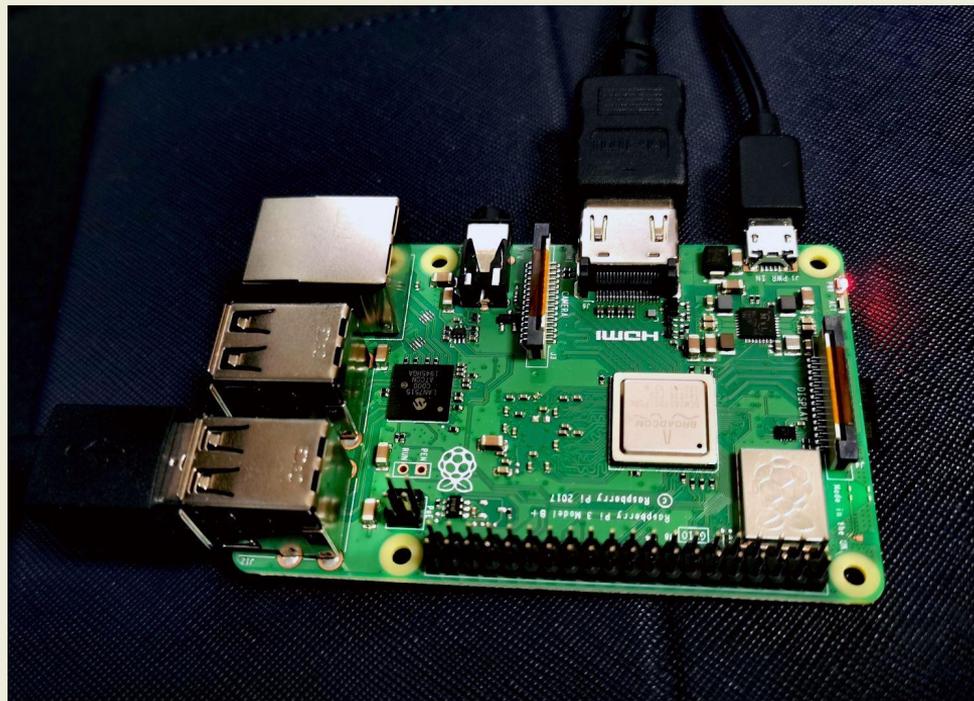


OSイメージのインストール



周辺機器接続

- 電源
- ディスプレイ
- マウス
- キーボード



周辺機器接続

- ❑ Raspberry Pi 3B+はBluetooth対応
- ❑ マウスやキーボードはワイヤレスでOK



さっそく起動してみる



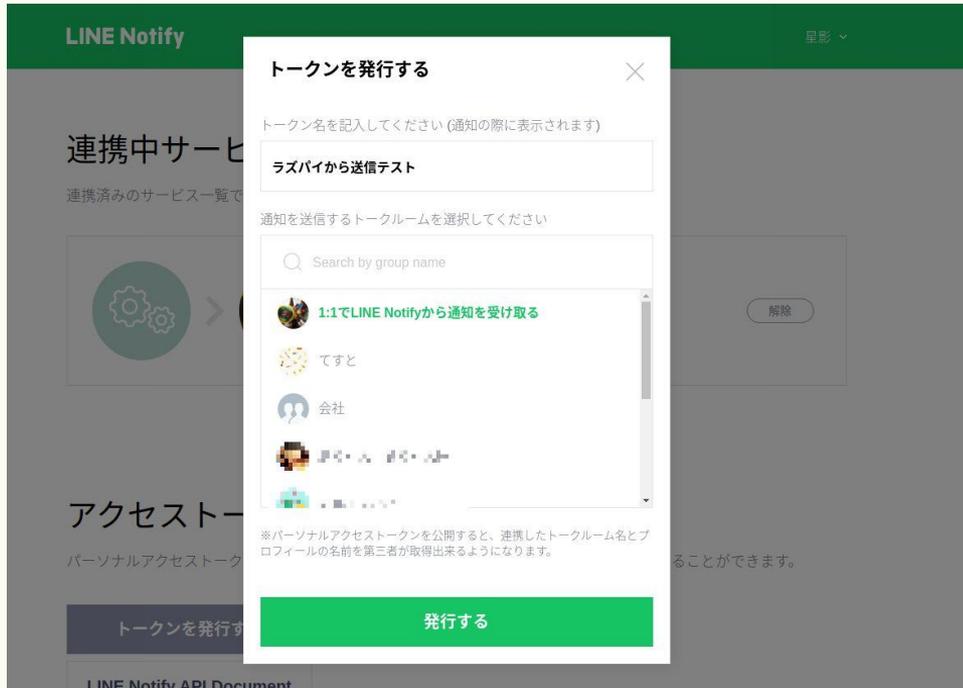
初期セットアップ



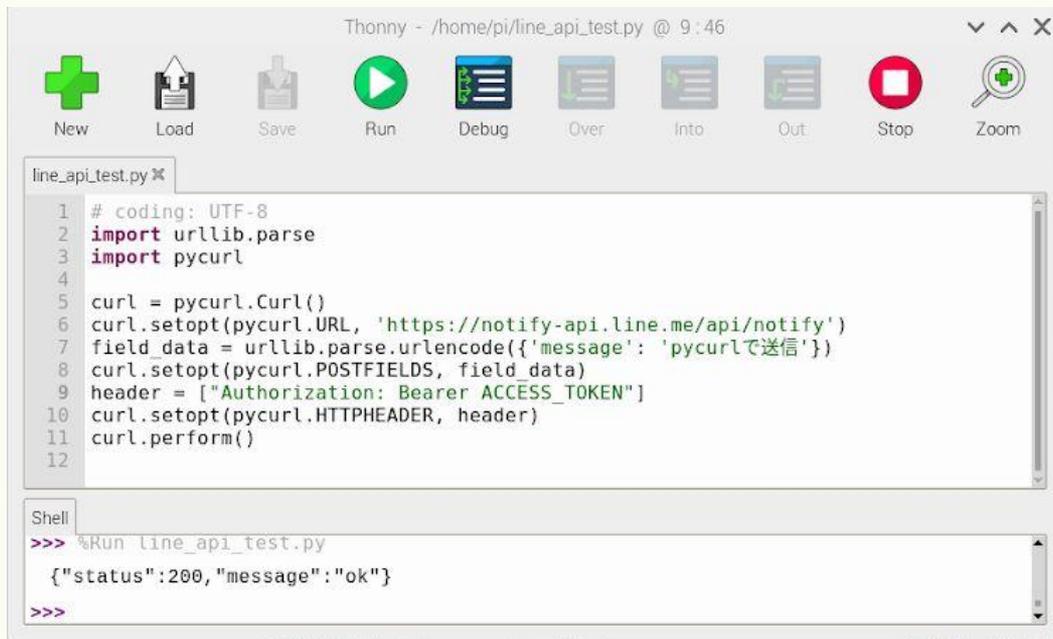
ブラウザはChromium

The image shows a Chromium browser window displaying the Raspberry Pi website. The browser's address bar shows the URL `raspberrypi.org`. The website's navigation menu includes links for Products, Blog, Downloads, Community, Help, Forums, Education, and Projects. The main content area features a large banner for the Raspberry Pi 4, described as a "tiny, dual-display, desktop computer," with a "Find out more" button. To the right of the banner is a "Coronavirus update" section, which states that the educational mission is more vital during lockdown and includes a "Donate" button. Below the main banner are four featured project cards: "Track your punches with Raspberry Pi" (0), "New twist on Raspberry Pi experimental resin 3D printer" (2), "Raspberry Pi calls out your custom workout routine" (1), and "Create a stop motion film with Digital Making at Home" (4). The browser's system tray on the right shows the time as 15:19 and icons for network, Bluetooth, and volume.

ラズパイからPythonでLINE Notify



PycURLでメッセージ送信を試してみる

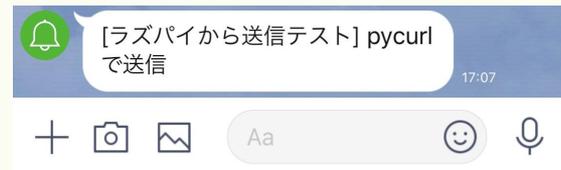


The screenshot shows the Thonny IDE interface. The top toolbar includes icons for New, Load, Save, Run, Debug, Over, Into, Out, Stop, and Zoom. The main editor window displays the following Python code:

```
1 # coding: UTF-8
2 import urllib.parse
3 import pycurl
4
5 curl = pycurl.Curl()
6 curl.setopt(pycurl.URL, 'https://notify-api.line.me/api/notify')
7 field_data = urllib.parse.urlencode({'message': 'pycurlで送信'})
8 curl.setopt(pycurl.POSTFIELDS, field_data)
9 header = ["Authorization: Bearer ACCESS_TOKEN"]
10 curl.setopt(pycurl.HTTPHEADER, header)
11 curl.perform()
12
```

Below the editor is a Shell window showing the execution of the script:

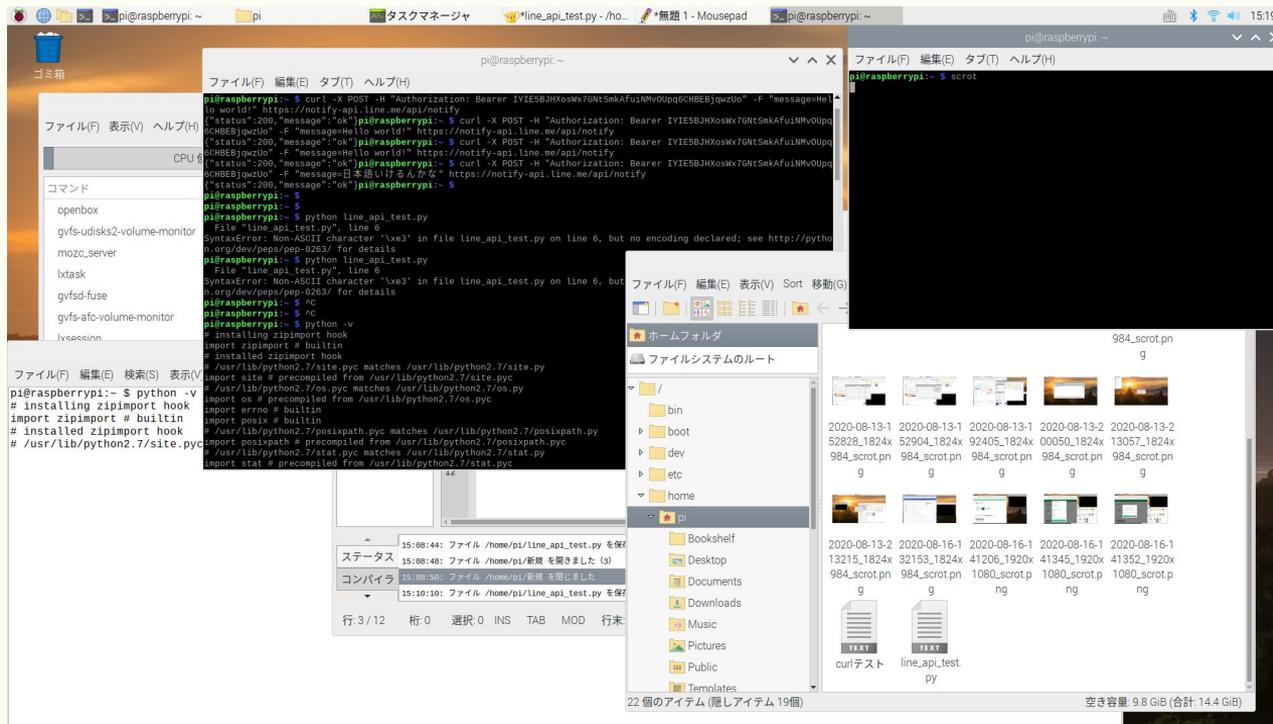
```
>>> %Run line_api_test.py
{"status":200,"message":"ok"}
>>>
```



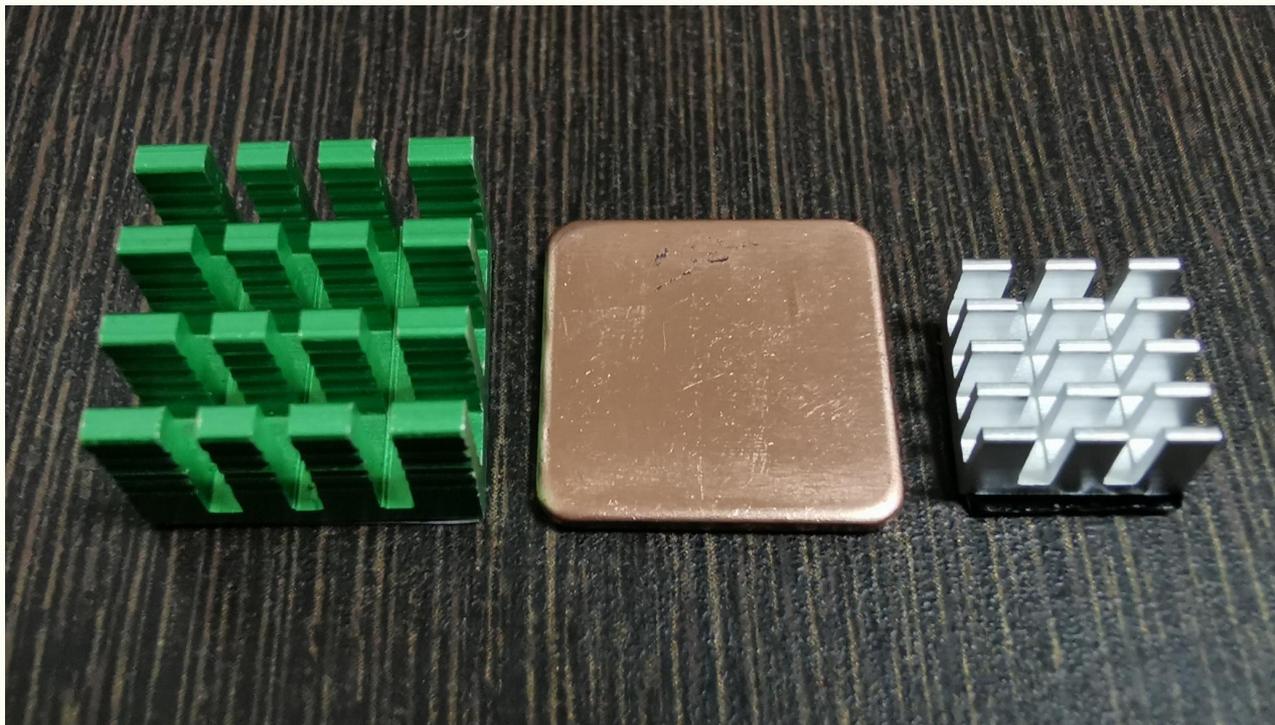
ラズパイ&Python初心者ハマリポイント

- ❑ pycurlのインストール(pip)や日本語メッセージ送信でエラー
- ❑ Raspberry Pi OSには複数のPython(2系、3系)インストール済み
- ❑ デフォルトは Python 2.7
- ❑ update-alternativesでデフォルトバージョン変更 2.7 -> 3.7
- ❑ pycurlをupgrade
- ❑ マルチバイト文字列送信のために文字コードUTF-8指定

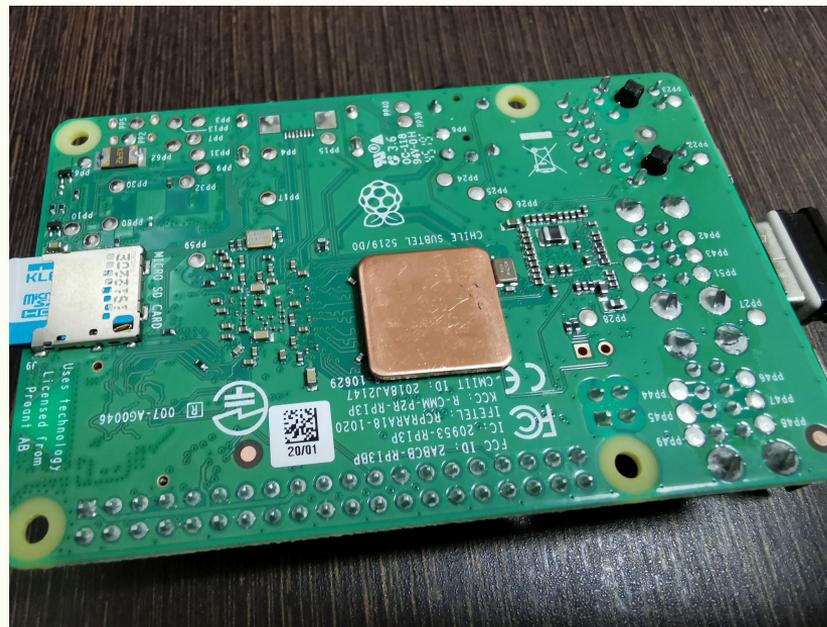
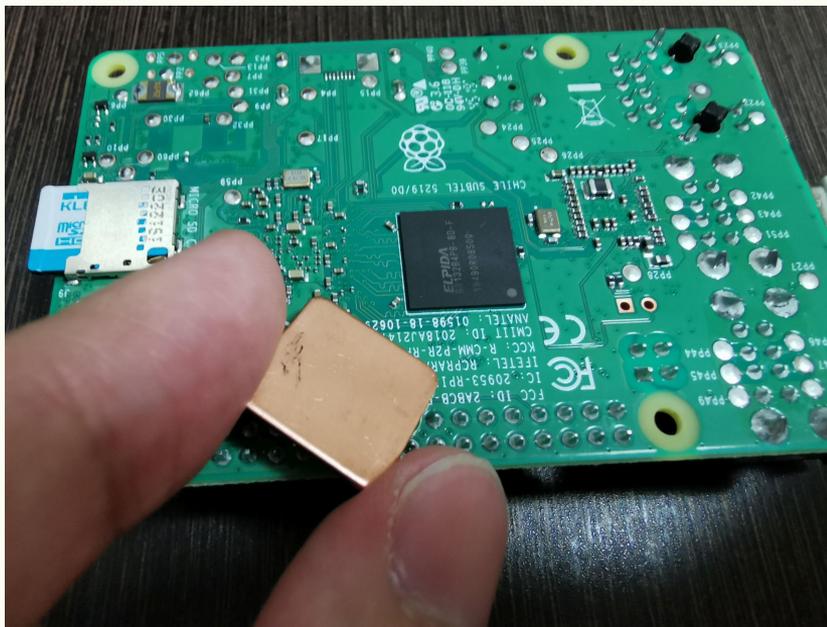
なんか普通に色々できそう



ヒートシンク(570円)



ヒートシンク



ヒートシンク



冷却ファン & 金属ケース (1,756円)



冷却ファン & 金属ケース



ケースを選ぶ楽しみ(自作も可)



GPIOピンについて



GPIOピンについて

```
pi@raspberrypi:~ $ pinout
┌───────────────────────────────────────────────────────────────────────────────────┐
│ 000000000000000000000000 J8 ───────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ │
│ 100000000000000000000000 PoE ─────────┘ └── USB ───┘ └── USB ───┘ └── USB ───┘ │
│ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ │
│ Wi  Fi  Pi Model 3B+ V1.3  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  │
│ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ │
│ D  S  I  SoC  C  S  I  A  I  V  ───────────┘ └── USB ───┘ └── Net ───┘ └── Net ───┘ │
│ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ │
│ pwr  HDMI  I  S  I  A  I  V  ───────────┘ └── Net ───┘ └── Net ───┘ └── Net ───┘ │
└───────────────────────────────────────────────────────────────────────────────────┘
Revision      : a020d3
SoC           : BCM2837
RAM          : 1024Mb
Storage      : MicroSD
USB ports    : 4 (excluding power)
Ethernet ports : 1
Wi-fi       : True
Bluetooth   : True
Camera ports (CSI) : 1
Display ports (DSI) : 1
```

```
J8:
  3V3 (1) (2) 5V
  GPIO2 (3) (4) 5V
  GPIO3 (5) (6) GND
  GPIO4 (7) (8) GPIO14
  GND (9) (10) GPIO15
  GPIO17 (11) (12) GPIO18
  GPIO27 (13) (14) GND
  GPIO22 (15) (16) GPIO23
  3V3 (17) (18) GPIO24
  GPIO10 (19) (20) GND
  GPIO9 (21) (22) GPIO25
  GPIO11 (23) (24) GPIO8
  GND (25) (26) GPIO7
  GPIO0 (27) (28) GPIO1
  GPIO5 (29) (30) GND
  GPIO6 (31) (32) GPIO12
  GPIO13 (33) (34) GND
  GPIO19 (35) (36) GPIO16
  GPIO26 (37) (38) GPIO20
  GND (39) (40) GPIO21
```

ブレッドボードやセンサー連携で電子工作

- ❑ LED
- ❑ 人感センサー
- ❑ 温湿度センサー
- ❑ タッチセンサー
- ❑ 光センサー
- ❑ NFCリーダー
- ❑ マイク/スピーカー
- ❑ カメラ



Go sailing with this stop-motion 3D-printed boat
A sailor's life, it is a merry life

Ashley Whittaker - 14th Jul 2020
2 comments



Travel the world with a retro musical phone
"Hello, is that France? Play French music from the 1920s"

Ashley Whittaker - 13th Jul 2020
0 comments



Let's make it colourful with Digital Making at Home
Get an introduction to the Sense HAT!

Kevin Johnson - 11th Jul 2020
0 comments



Deep learning cat prey detector
No Simba, I don't want half a mouse, but thank you so much

Ashley Whittaker - 10th Jul 2020
14 comments



Distributing Raspberry Pi computers to help families access education



Learn at home #4: All about Scratch
Scratch is not just for



Website hosting on Raspberry Pi 4 with Mythic Beasts



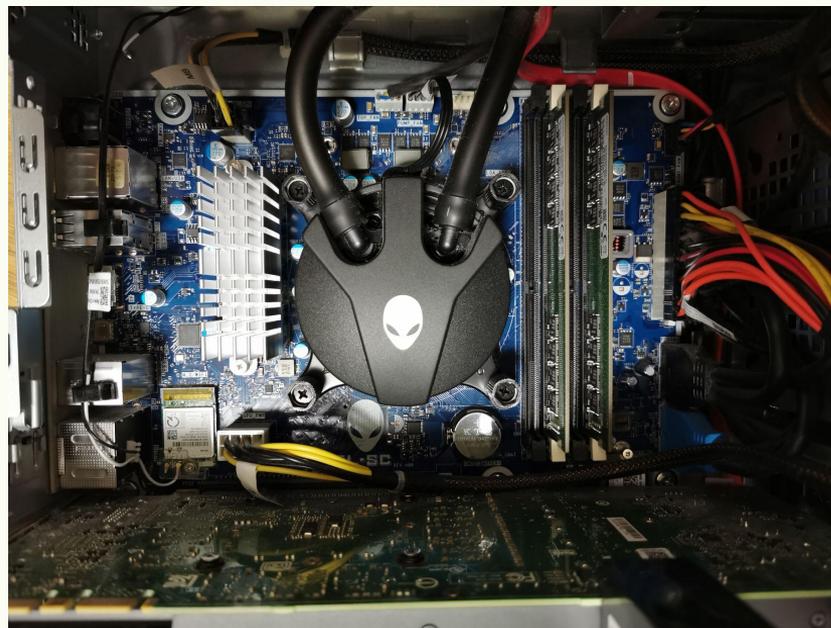
Reducing the load: ways to support novice programmers

タッチ対応ディスプレイ、スタンドなども



[\(1\) Raspberry Pi Display and Cases | RS Components - YouTube](#)

まさにコンピューターの基礎が学べる教材



Raspberry Pi

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