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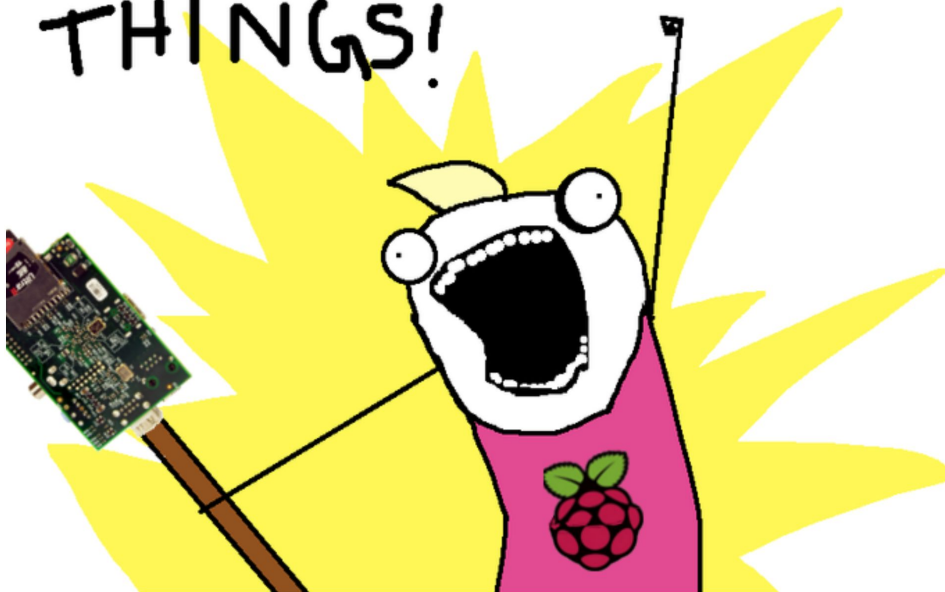
ritlug.com/get-involved, rit-lug.slack.com

Pi Fest!

October 2019

Jeffery Russell

CONNECT ALL THE
THINGS!



What Is a Raspberry Pi?



Raspberry Pis are...

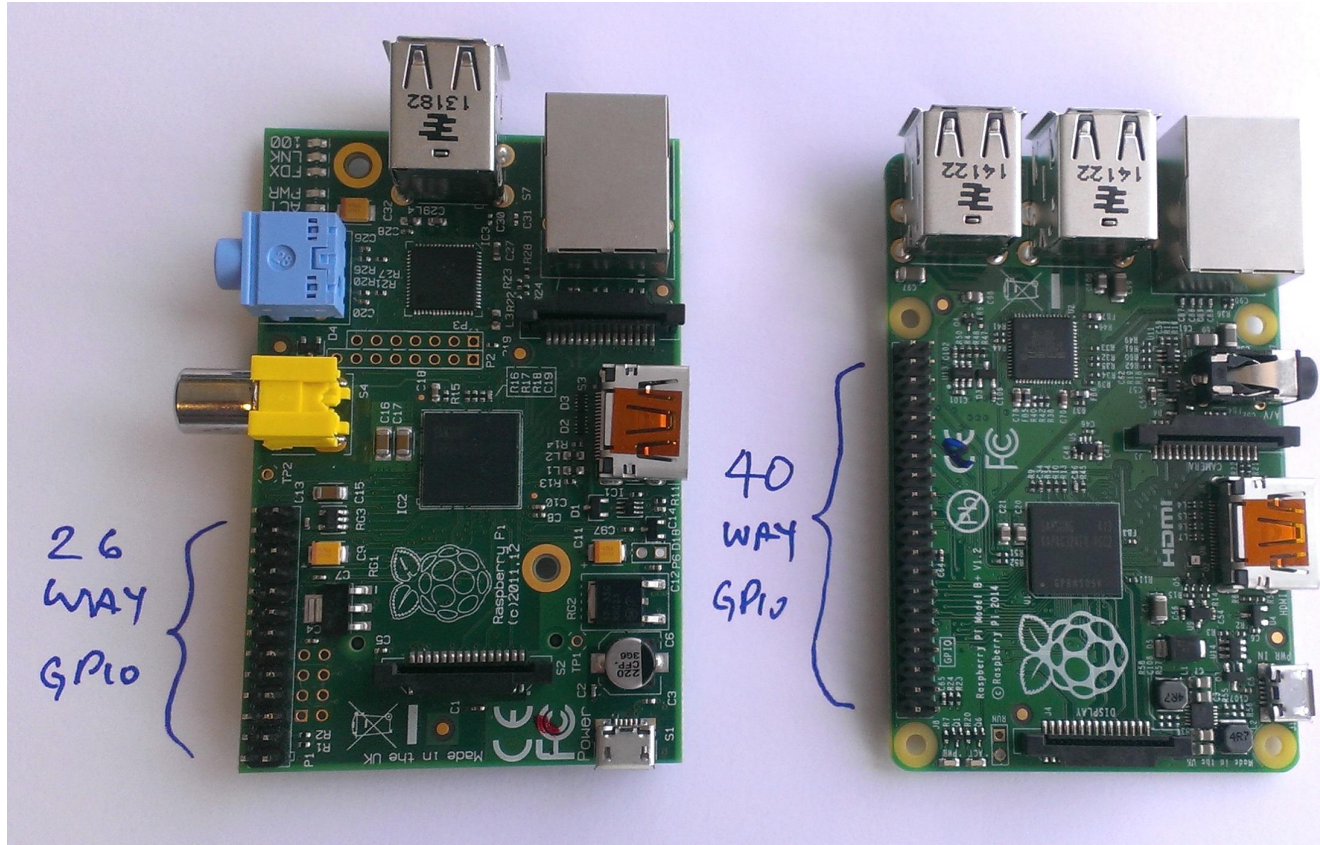


- Small
 - Cheap
 - Single Board Computers
 - Developed by a UK company
 - Aimed towards education and DIY projects
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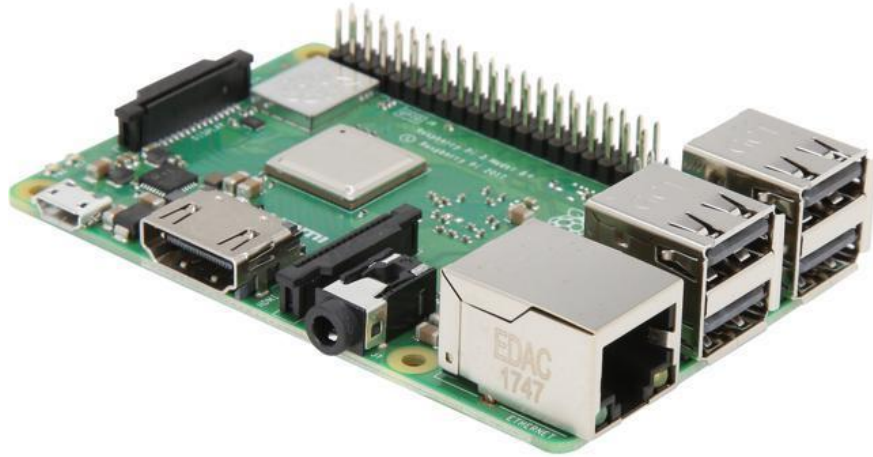
What Type of Pies are there?



Pi 1, 2: Aka “good old bois”



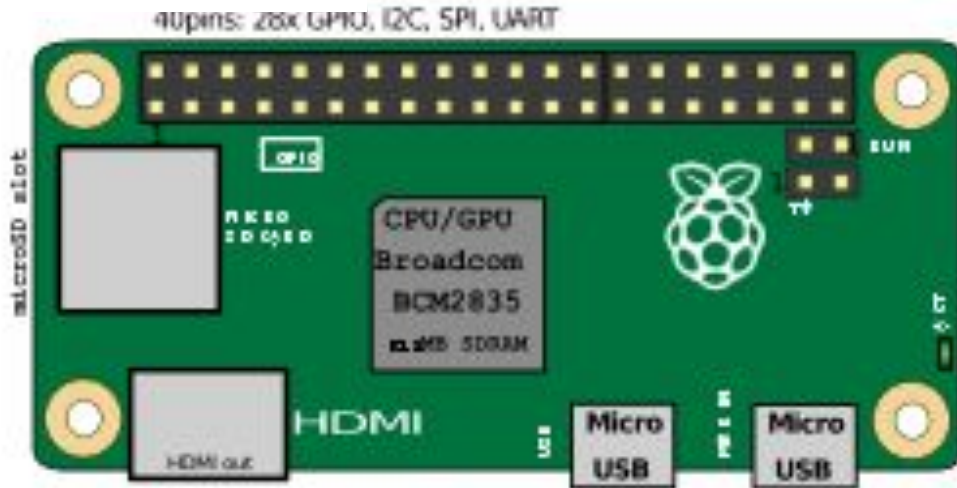
Pi 3: Aka Just a Pi



- Only \$35
 - On board wifi and bluetooth 4.1
 - 4 USB 2.0 ports
 - 1 GB of RAM
 - Full sized HDMI port
 - Micro sd card port
 - 40 GPIO pins
 - 1.2 GHZ quad core processor
 - Micro usb power
-

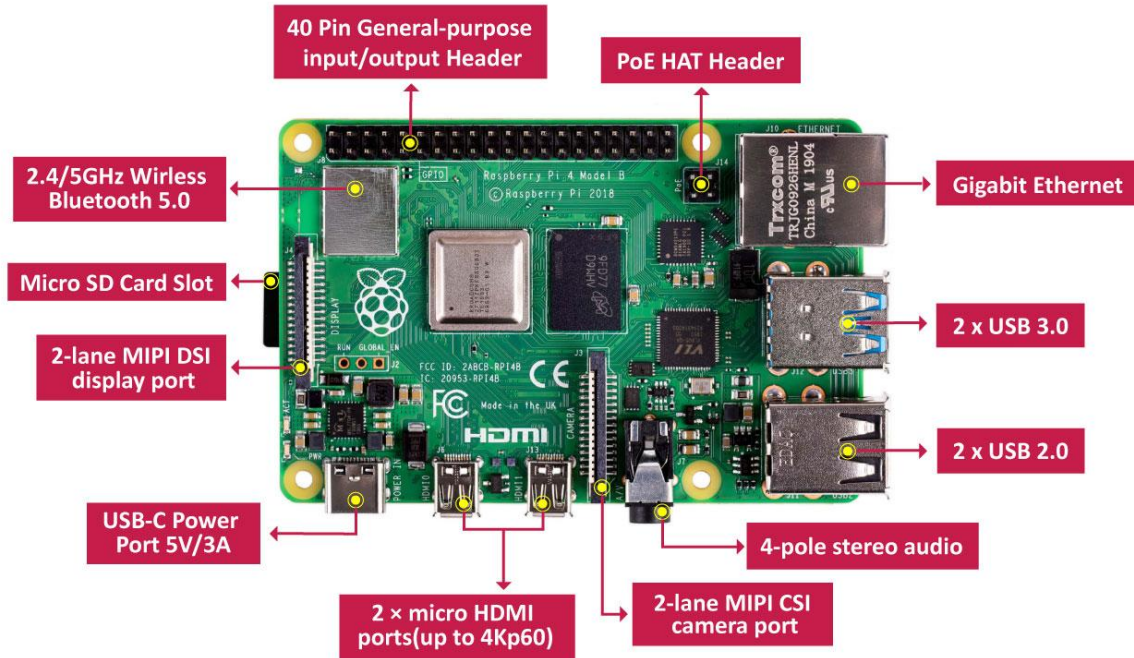


Pi Zero: Aka “Small Boi”



- 512 MB ram
 - Mini hdmi
 - 40 pin GPIO
 - Micro sd card for storage
 - Micro USB
 - Only “\$5”!!!
-

Pi 4: Aka “Big Boi”, “Basically a PC”



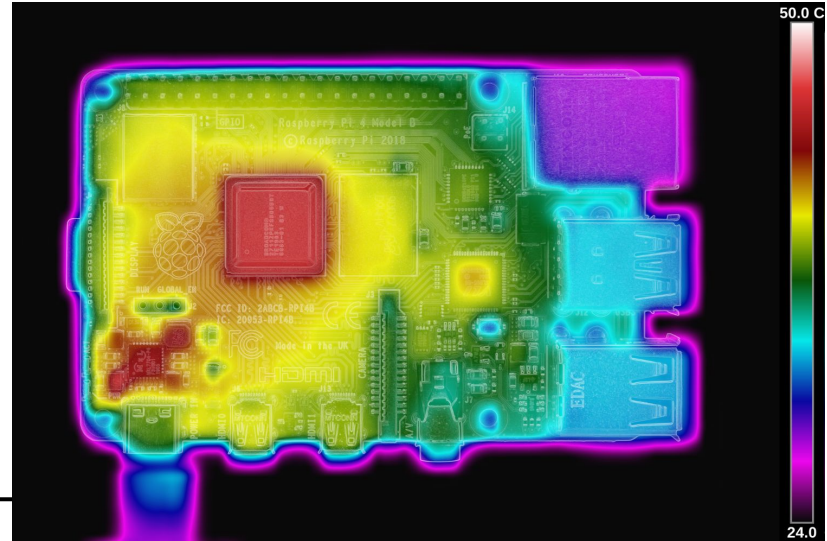
- Ram ranges between 1-4GB
- Quad core ARM chip running at 1.5GHZ
- USB 3.0
- Gigabit Ethernet
- Dual 4k Micro HDMI ports
- Bluetooth 5.0
- Onboard Wireless chip
- Price between 35-55

My new PC has
128GB or RAM, SLI
1080ti an i9 7900X
and-

NeedsRGB



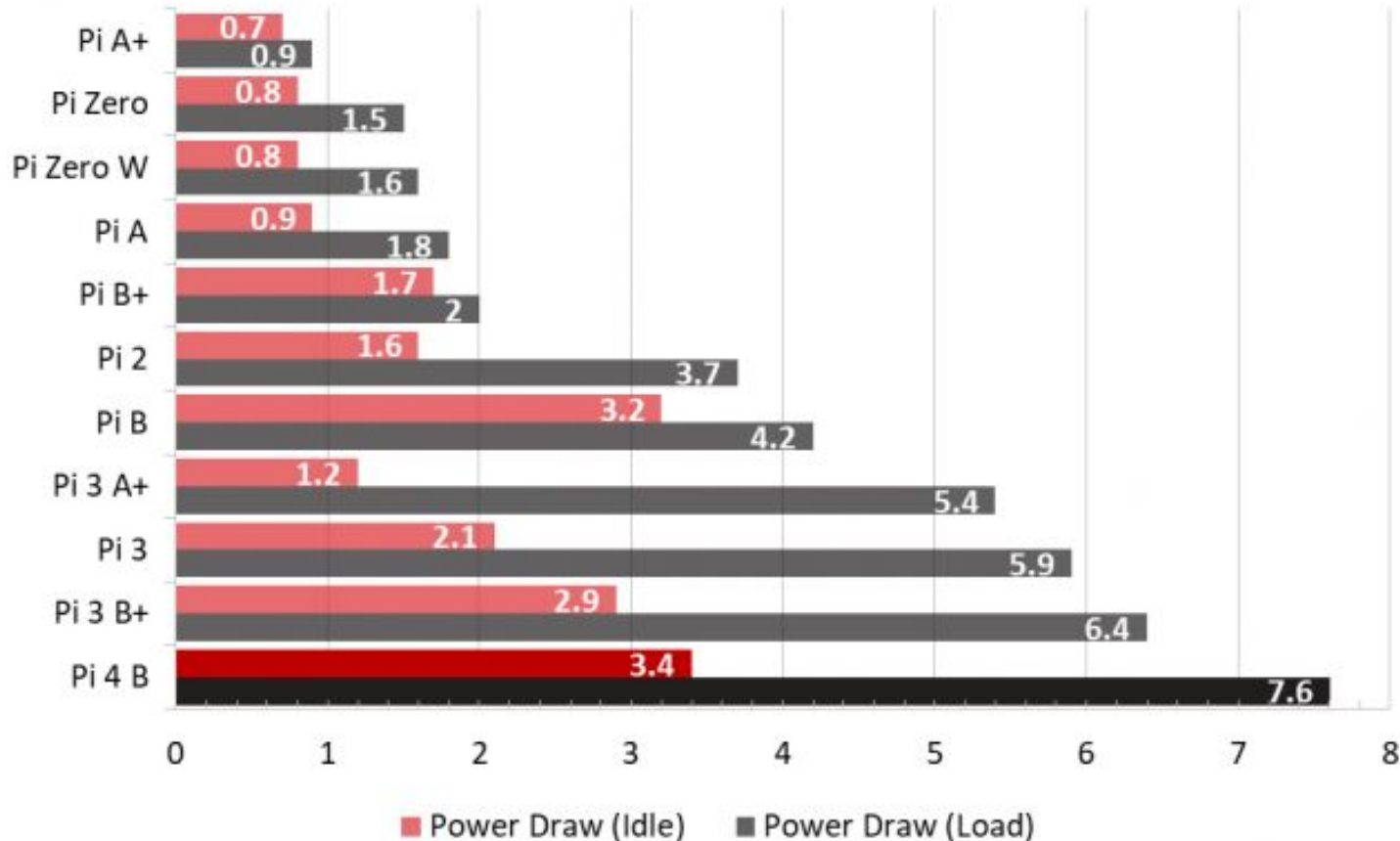
The Pi 4 gets hot...



Power Draw Benchmark

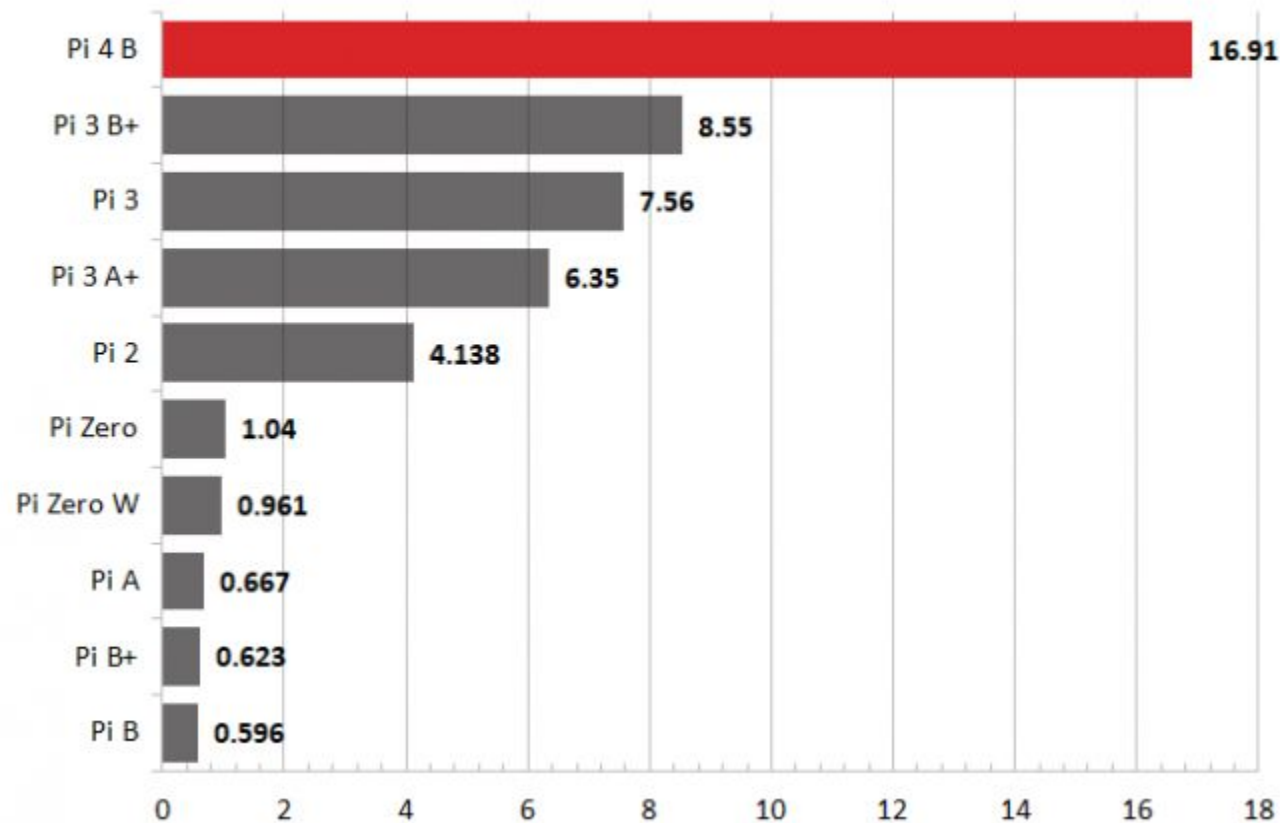
Watts (Lower is Better)

tom's **HARDWARE**



Speedometer 2.0 Browser Benchmark
Runs Per Minute (Higher is Better)

tom's **HARDWARE**



- The “speedometer” benchmark measures overall responsiveness by loading web apps.
 - [Source](#)
-

Family	Model	Form Factor	Ethernet	Wireless	GPIO	Released	Discontinued
Raspberry Pi 1	B	Standard (85.60 × 56.5 mm)	Yes	No	26-pin	2012	Yes
	A		No			2013	Yes
	B+	Compact (65 × 56.5 mm)	Yes		40-pin	2014	
	A+		No			2014	
Raspberry Pi 2	B	Standard	Yes	No		2015	
Raspberry Pi Zero	Zero	Zero (65 × 30 mm)	No	No	40-pin	2015	
	W/WH			Yes		2017	
Raspberry Pi 3	B	Standard	Yes	Yes		2016	
	A+	Compact	No		2018		
	B+	Standard	Yes		2018		
Raspberry Pi 4	B (1GB)	Standard	Yes	Yes	40-pin	2019 ^[26]	
	B (2GB)						
	B (4GB)						

What Can they Do?



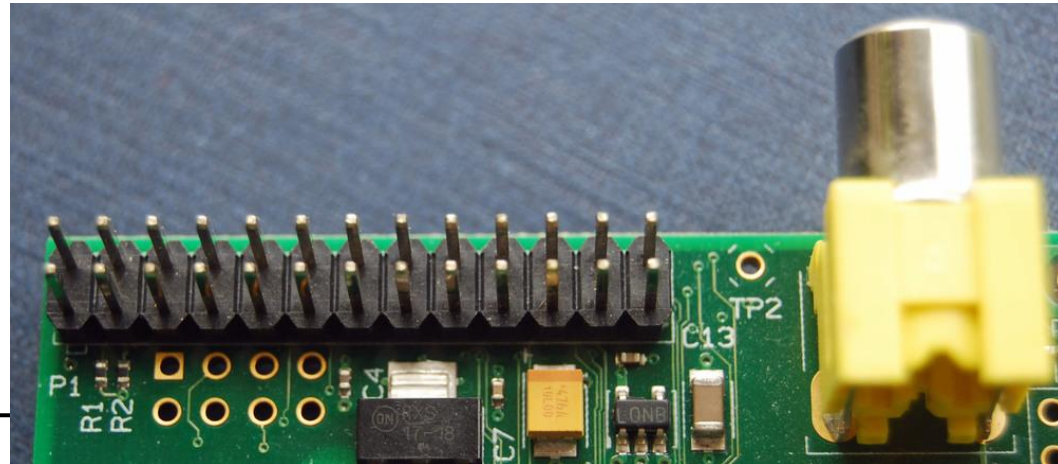
GPIO#	2nd func.	Pin#	Pin#	2nd func.	GPIO#
	+3.3 V	1	2	+5 V	
2	SDA1 (I ² C)	3	4	+5 V	
3	SCL1 (I ² C)	5	6	GND	
4	GCLK	7	8	TXD0 (UART)	14
	GND	9	10	RXD0 (UART)	15
17	GEN0	11	12	GEN1	18
27	GEN2	13	14	GND	
22	GEN3	15	16	GEN4	23
	+3.3 V	17	18	GEN5	24
10	MOSI (SPI)	19	20	GND	
9	MISO (SPI)	21	22	GEN6	25
11	SCLK (SPI)	23	24	CE0_N (SPI)	8
	GND	25	26	CE1_N (SPI)	7

(Pi 1 Models A and B stop here)

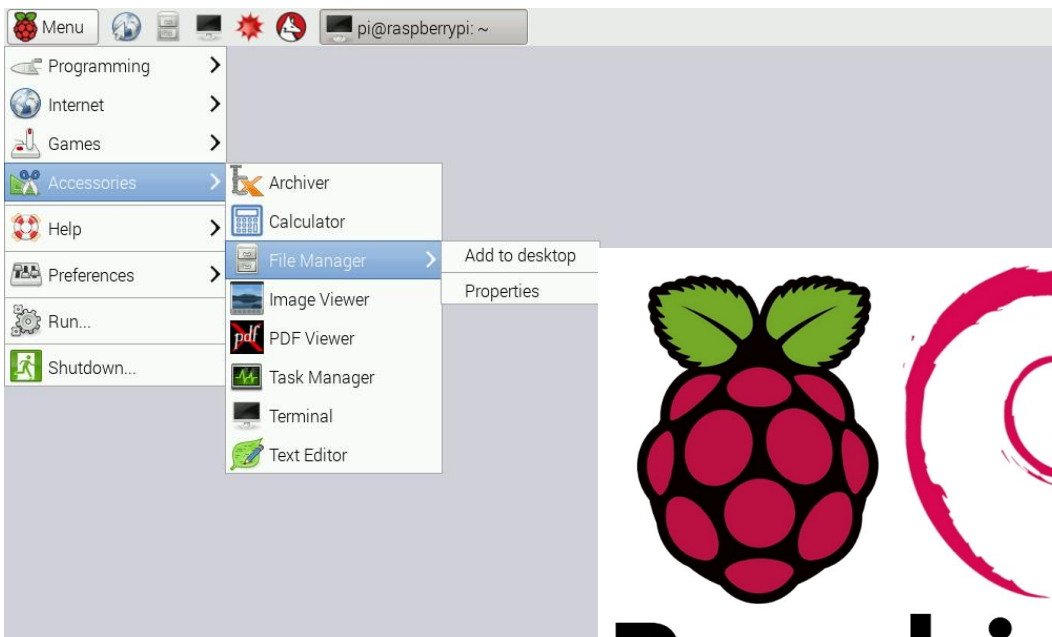
EEPROM	ID_SD	27	28	ID_SC	EEPROM
5	N/A	29	30	GND	
6	N/A	31	32		12
13	N/A	33	34	GND	
19	N/A	35	36	N/A	16
26	N/A	37	38	Digital IN	20
	GND	39	40	Digital OUT	21

GPIO Pins

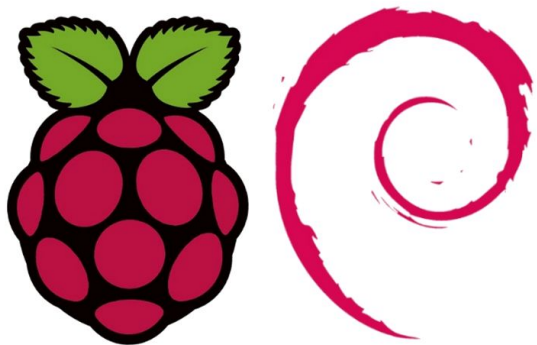
- GPIO (General-Purpose input/output)
- Programmable pins makes it ideal for hardware projects



These things run an entire OS with a Desktop environment!



- Official distribution for the Pis is Raspbian
 - Comes with a bunch of educational software bundled
 - Debian based
 - Optimized for Raspberry pis

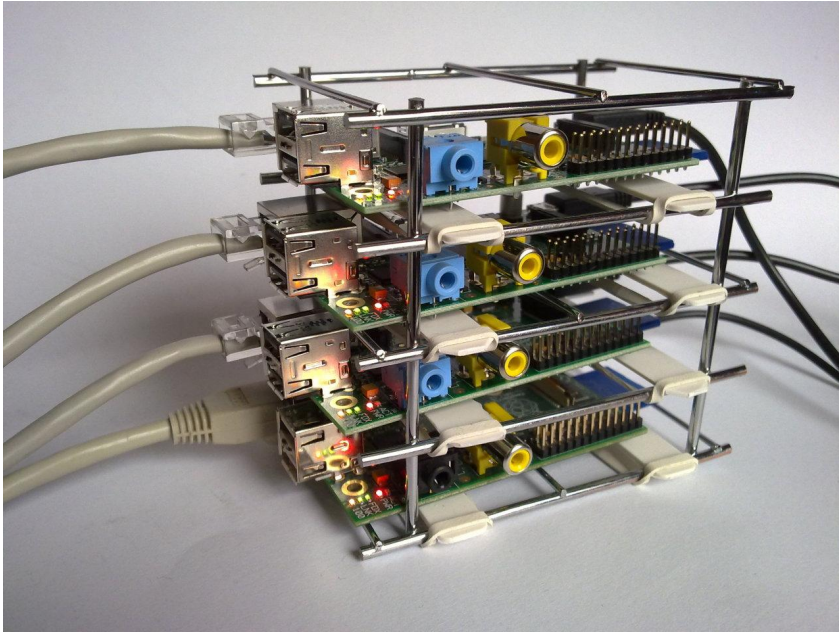


Raspbian

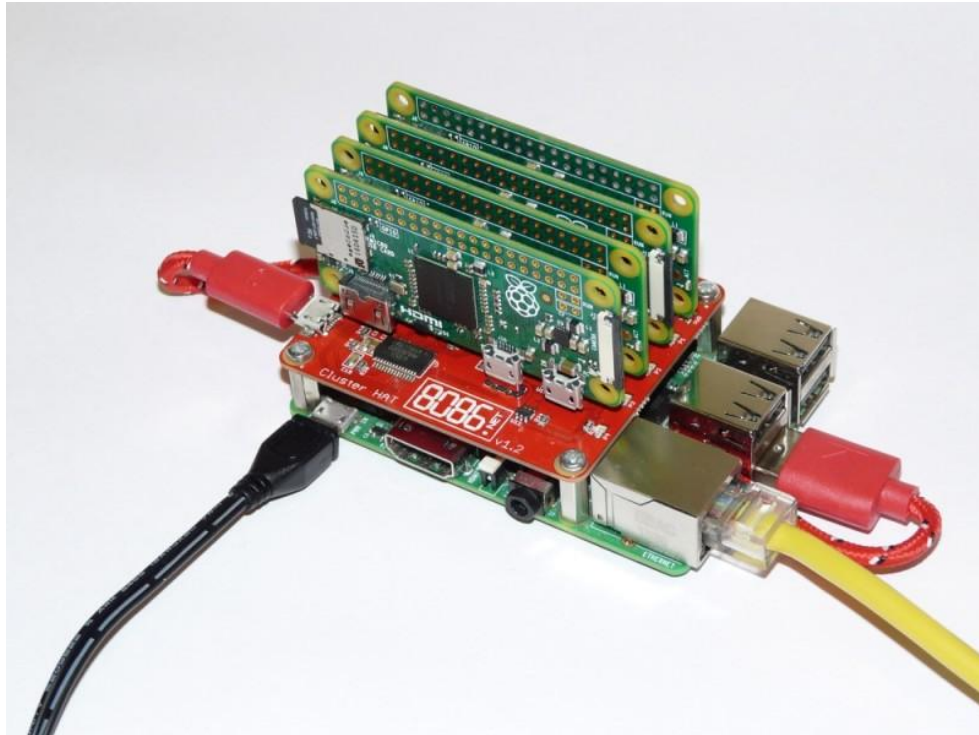
Projects!!



Clusters



- Small, cheap computers is an excellent way to play around with and test distributed systems
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- [Cluster Hat](#) project created a board which enables you to connect 4 Pi Zeros to a single Raspberry Pi
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Magic Mirrors

- oh mirror oh mirror on the wall... how shall I install Gentoo on this ball?



Retro Pi

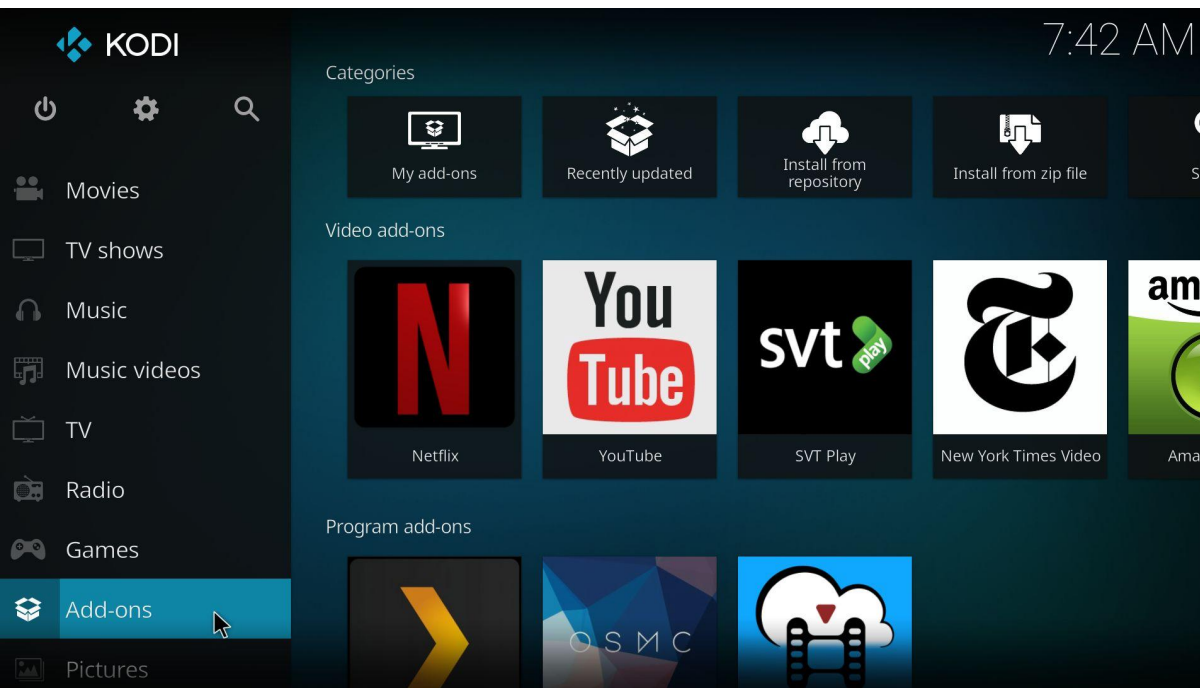


- Bundles and nicely provides a user interface for open source game emulators on the Pi
- Easy to install
- You can play games from:
 - Atari
 - GameCube
 - GameBoy, GB Color
 - Nintendo 64
 - Nintendo DS
 - Dos
 - Dragon 32?
 - And many more!!!

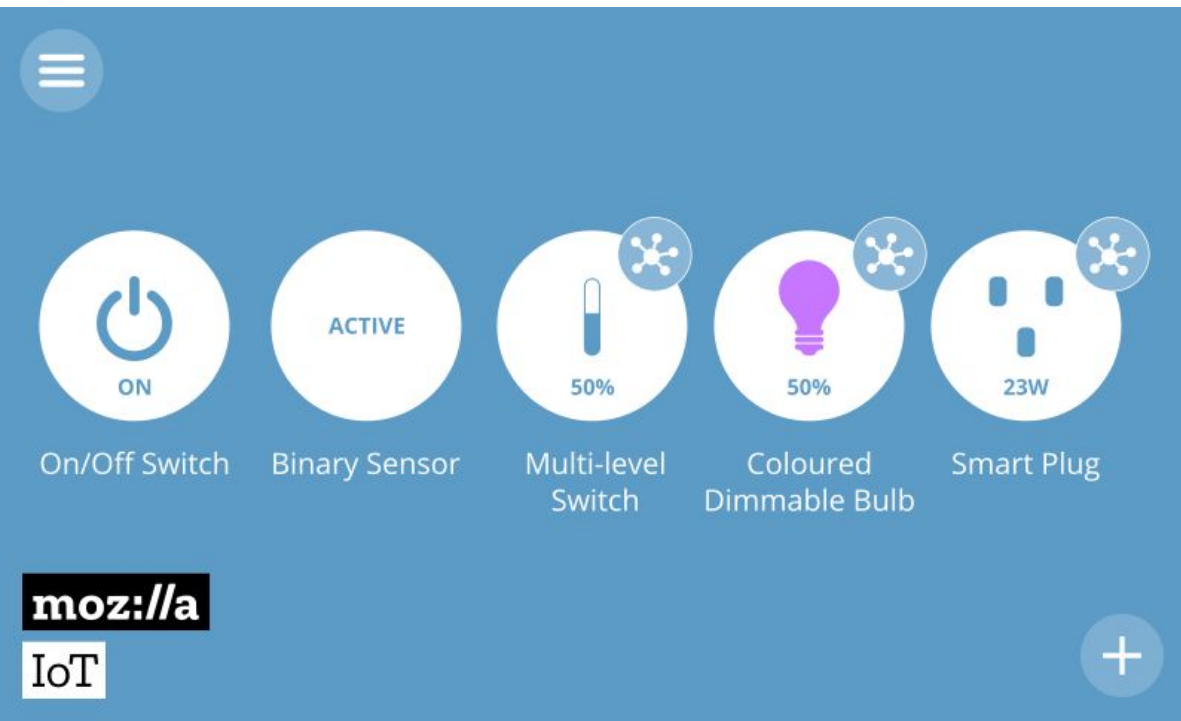


Kodi

- Open source theatre software

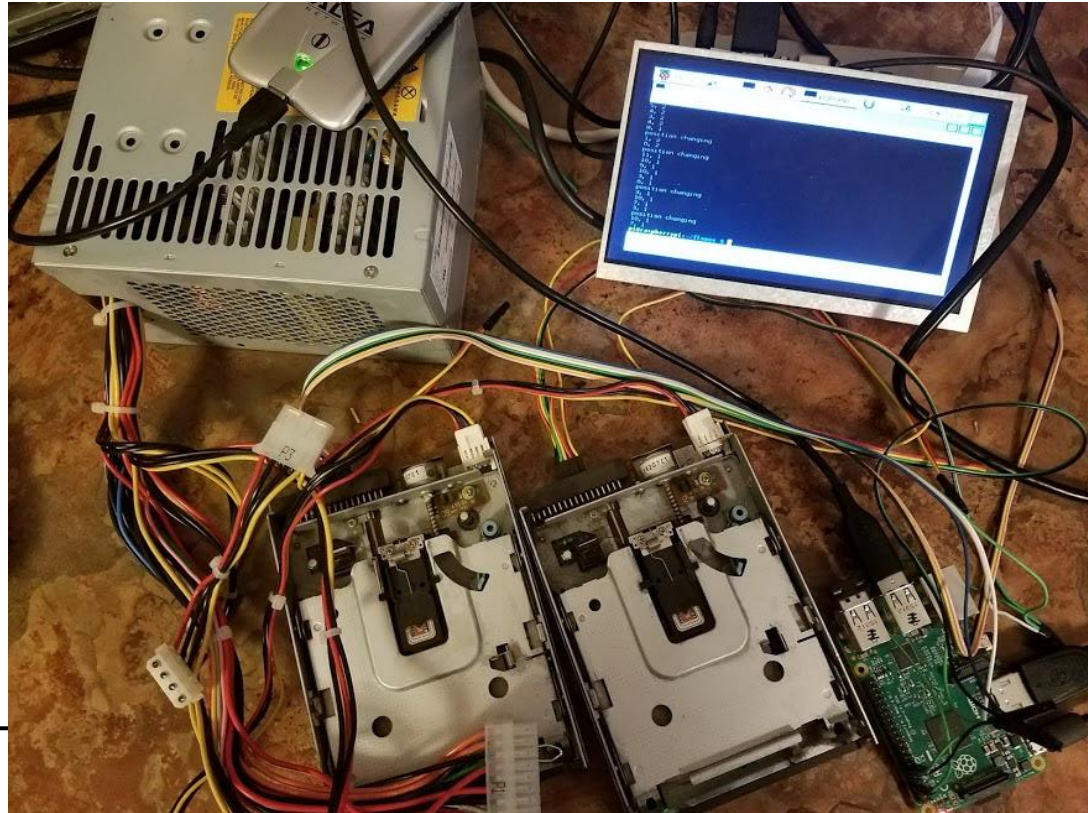


Mozilla IOT Web Things



- Open platform for monitoring and controlling open home devices

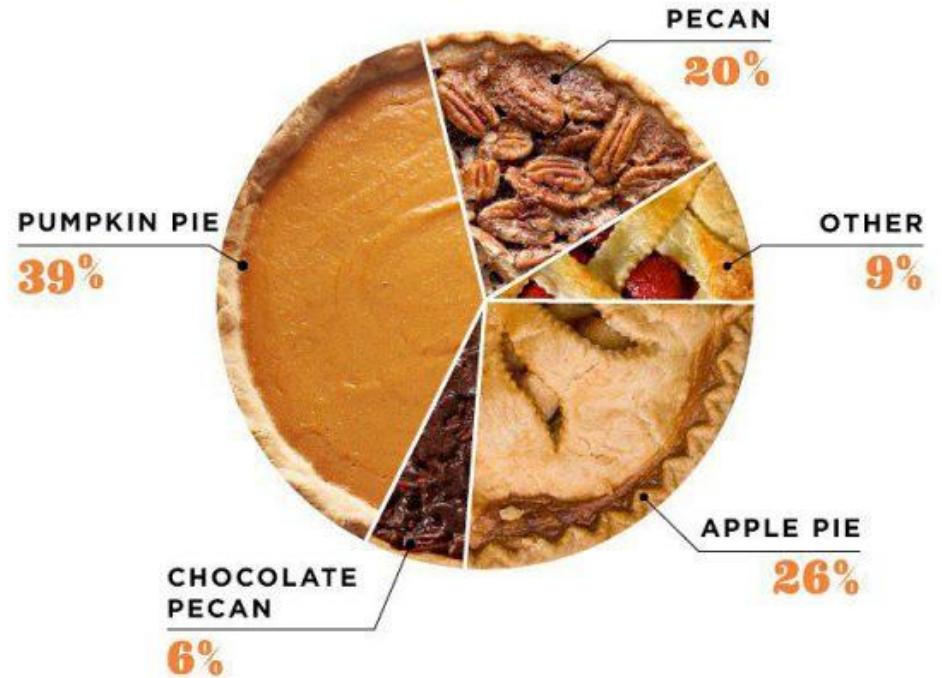
Musical Floppy Drives!!



Questions?

. AMERICA'S .

Favorite Pies



Live Pi Demo and Workshop

