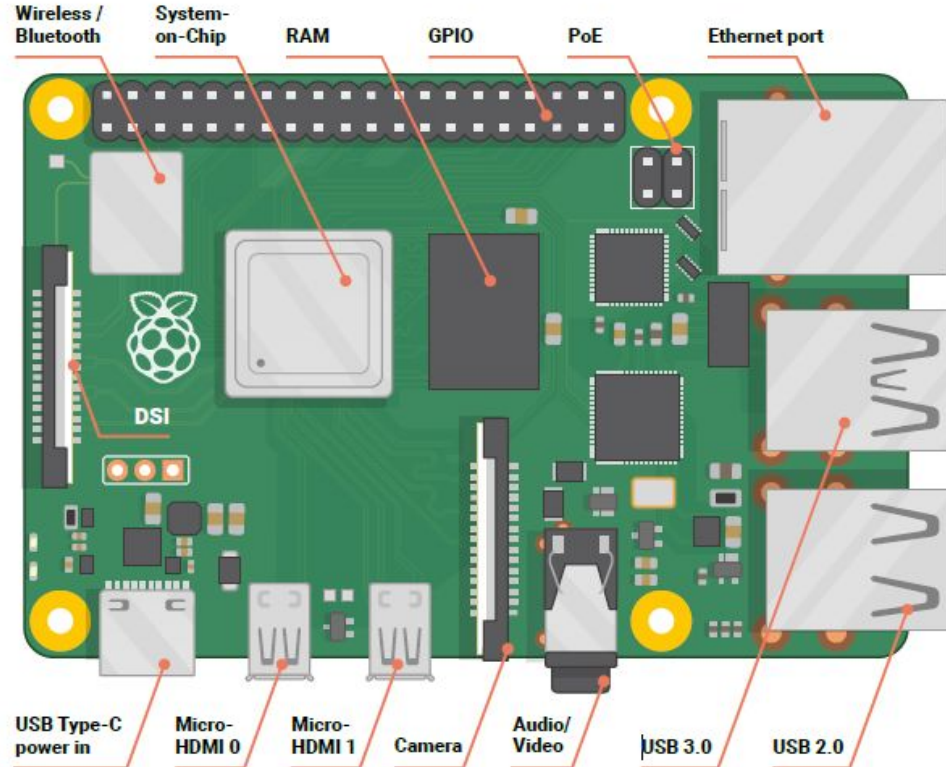


Introduction to the Raspberry Pi



Course Content

1. Lesson 1: What is a Raspberry Pi (RPI)
2. Lesson 2: Getting started with the RPI
3. Lesson 3: How to configure the RPI
4. Lesson 4: Getting to know the RPI Operating System (OS)
5. Lesson 5: Intro to programming with Scratch 3
6. Lesson 6: Intro to programming with Python
7. Lesson 7: Physical Computing with Scratch & Python
8. Lesson 8: Physical Computing with the Sense HAT
9. Lesson 9: Raspberry Pi Camera Module
10. Lesson 10: The command-line interface

Lesson 1: What is a Raspberry Pi (RPI)

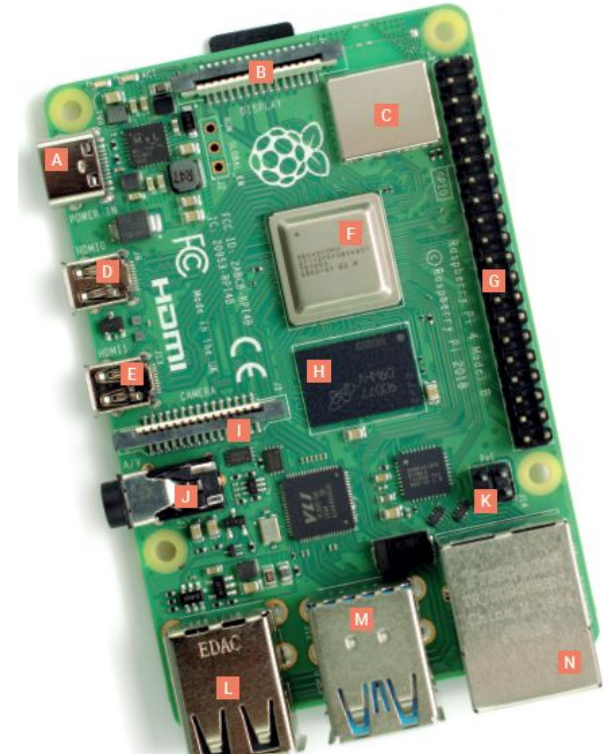
1. Guided tour of the RPi

- a. Discussing and identifying all the hardware components
 - i. System on Chip (SoC)
 - ii. Memory
 - iii. Radio Module
 - iv. Power Management Circuitry (PMIC)
 - v. USB Ports
 - vi. Ethernet Port
 - vii. Audio / Video Jack
 - viii. Camera Connector
 - ix. HDMI Ports
 - x. Power Connector
 - xi. Display Connector
 - xii. GPIO Header
 - xiii. MicroSD Card Connector

2. RPi types

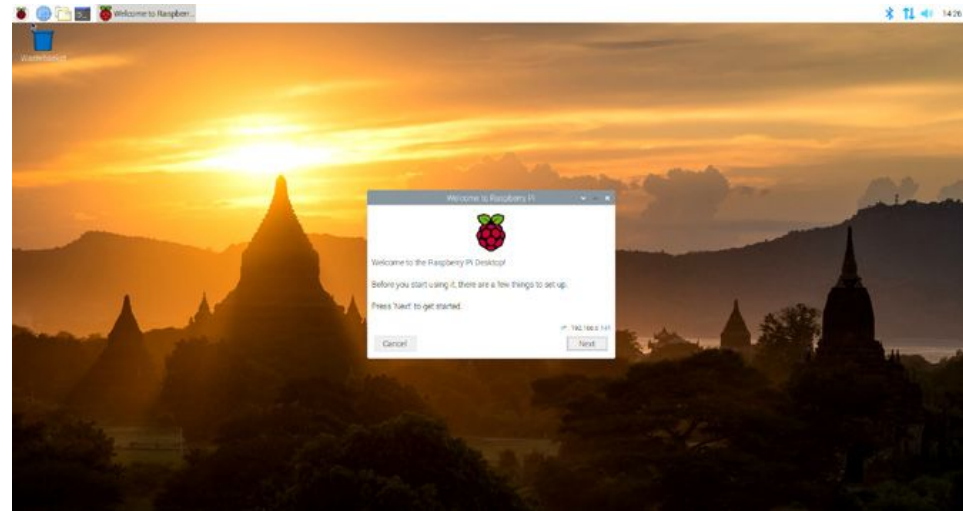
- a. RPi, RPi2, RPi3, RPi4, Pi Zero, Pico, Compute Module

A	USB Type-C power in	F	System-on-chip	K	PoE
B	DSI display port	G	GPIO	L	USB 2.0
C	Wireless / Bluetooth	H	RAM	M	USB 3.0
D	Micro-HDMI 0	I	CSI camera port	N	Ethernet port
E	Micro-HDMI 1	J	3.5mm AV		



Lesson 2: Getting started with the RPi

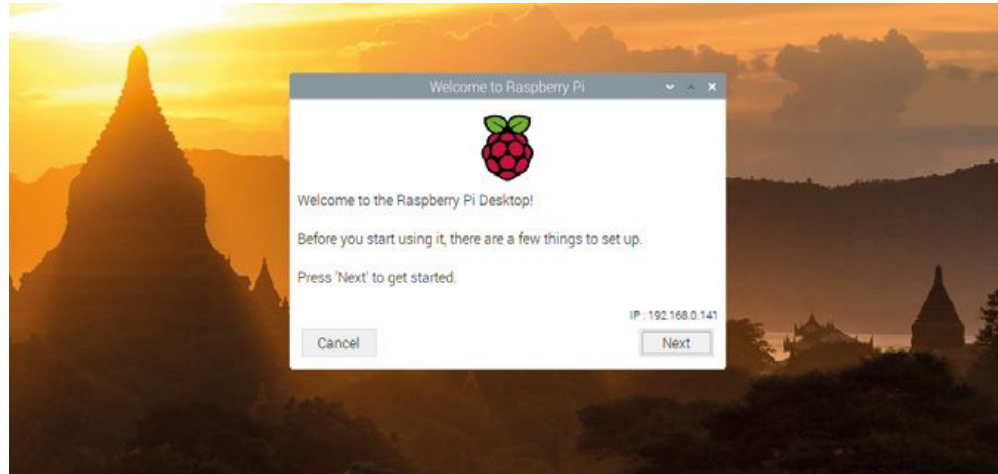
1. What you need to get started
 - a. USB Power Supply
 - b. MicroSD Card
 - c. Keyboard & Mouse
 - d. Micro HDMI Cable
2. Setting up the Hardware
3. Connecting the microSDCard
4. Connecting the keyboard & mouse
5. Connecting a display
6. Network Connection
7. Connecting a power supply
- 8.



Lesson 3: How to configure the RPi

1. RPi Configuration

- a. Welcome Wizard
- b. Setup Country, Language and Timezone
- c. Setting a new password
- d. Desktop Screen setup
- e. Choosing a network connection
- f. Checking for Updates
- g. Restarting RPi



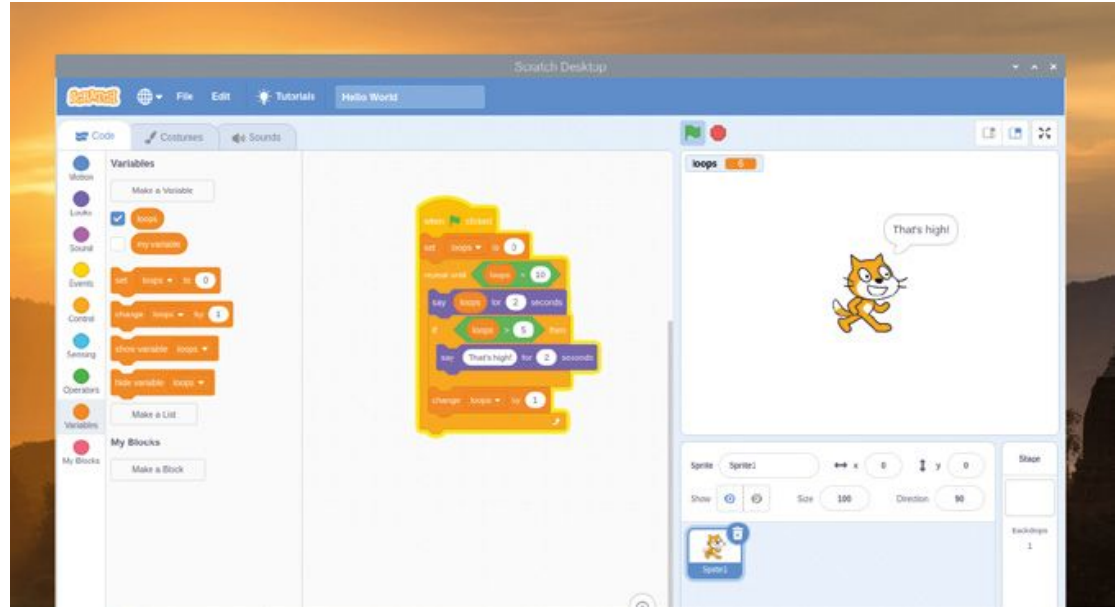
Lesson 4: Getting to know the RPi Operating System (OS)

1. Desktop Overview
2. Chromium Web Browser
3. File Manager
4. LibreOffice
5. Terminal
6. Recommended Software Tool
7. RPi Config Tool
8. Shutting down



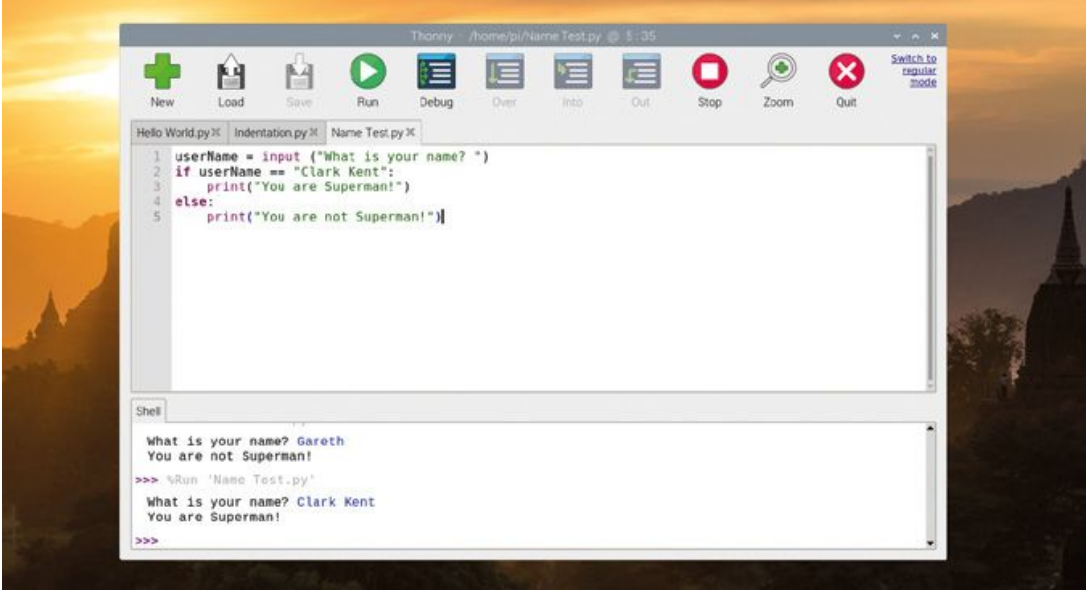
Lesson 5: Intro to programming with Scratch 3

1. Scratch 3 Interface
2. Your first program
3. Sequencing
4. Looping the loop
5. Variables and conditionals
6. Projects
 - a. Astronaut Reaction Timer
 - b. Synchronised swimming
 - c. Archery Game



Lesson 6: Intro to Programming with Python

1. Thonny Python IDE
2. Your first Python program
3. Loops & code indentation
4. Variables & conditionals
5. Projects
 - a. Turtle Snowflakes
 - b. Scary spot the differences
 - c. RPG Maze



The screenshot shows the Thonny Python IDE interface. The main editor window displays a Python script named 'Name Test.py' with the following code:

```
1 userName = input ("What is your name? ")
2 if userName == "Clark Kent":
3     print("You are Superman!")
4 else:
5     print("You are not Superman!")
```

Below the editor is a Shell window showing the execution output:

```
What is your name? Gareth
You are not Superman!

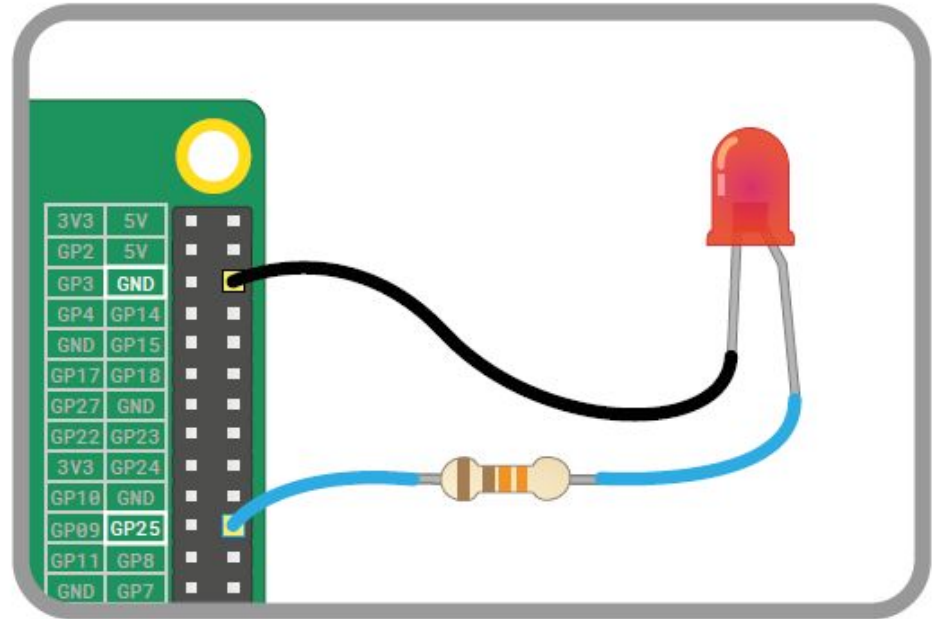
>>> %Run 'Name Test.py'
What is your name? Clark Kent
You are Superman!

>>>
```

The IDE's toolbar at the top includes icons for New, Load, Save, Run, Debug, Over, Into, Out, Stop, Zoom, and Quit. The title bar indicates the file path is /home/pi/Name Test.py and the current time is 1:35.

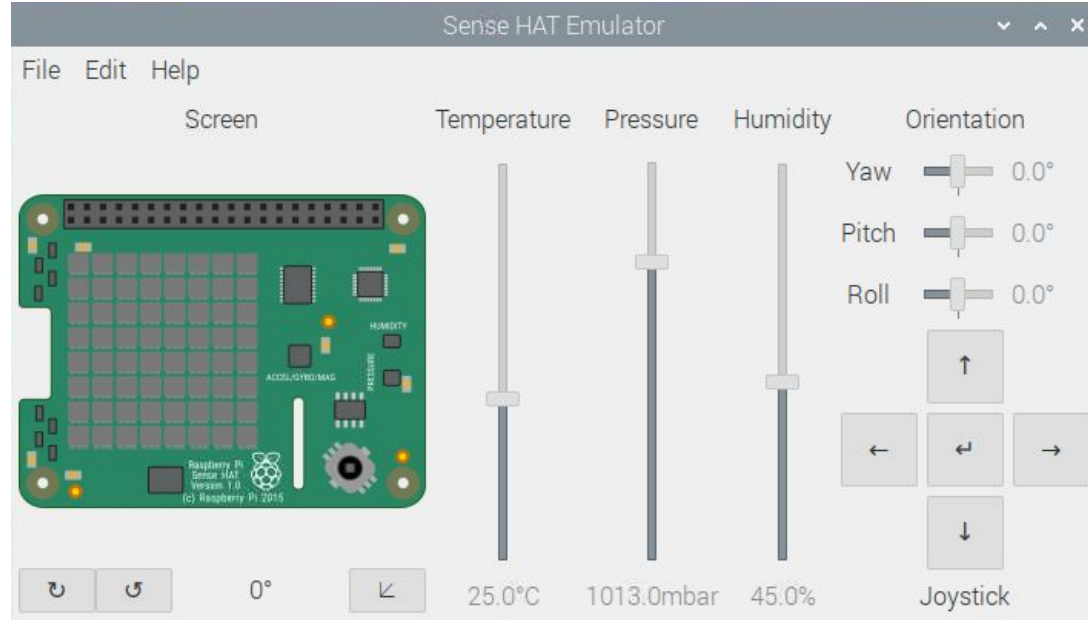
Lesson 7: Physical Computing with Scratch & Python

1. Introducing the GPIO Header
2. Electronic Components
 - a. Breadboard
 - b. Connecting wires
 - c. Push button
 - d. Light Emitting Diode (LED)
 - e. Resistors
 - f. Buzzer
3. Reading resistor color codes
4. LED control in scratch
5. LED control in python
6. Using a breadboard
7. Reading a button
 - a. Reading a button in Scratch
 - b. Reading a button in Python
8. Controlling a buzzer
 - a. Controlling a buzzer in Scratch
 - b. Controlling a buzzer in Python
9. Scratch Project - Traffic Lights
10. Python Project - Quick Reaction Game



Lesson 8: Physical Computing with the Sense HAT

1. Introducing the Sense HAT
2. Hello, Sense HAT
3. Greetings from Scratch
4. Greetings from Python
5. Drawing with Light
6. Draw Pictures in Scratch
7. Draw Picture in Python
8. Environmental sensing
 - a. Environmental sensing in Scratch
 - b. Environmental sensing in Python
9. Inertial sensing
 - a. Inertial sensing in Scratch
 - b. Inertial sensing in Python
10. Joystick control
 - a. Joystick control in Scratch
 - b. Joystick control in Python
11. Scratch Project - Sense HAT Sparkler
12. Python Project - Sense HAT Tricorder



Lesson 9: Raspberry Pi Camera Module

1. Installing the camera
2. PiCamera
3. Capturing still pictures
4. Capturing moving video
5. Push-button stop-motion animation
6. Advanced camera settings



Lesson 10: The command-line interface

1. Terminal program
2. The prompt
3. Navigating
4. File handling
5. Running programs
6. Using the TTYs

