

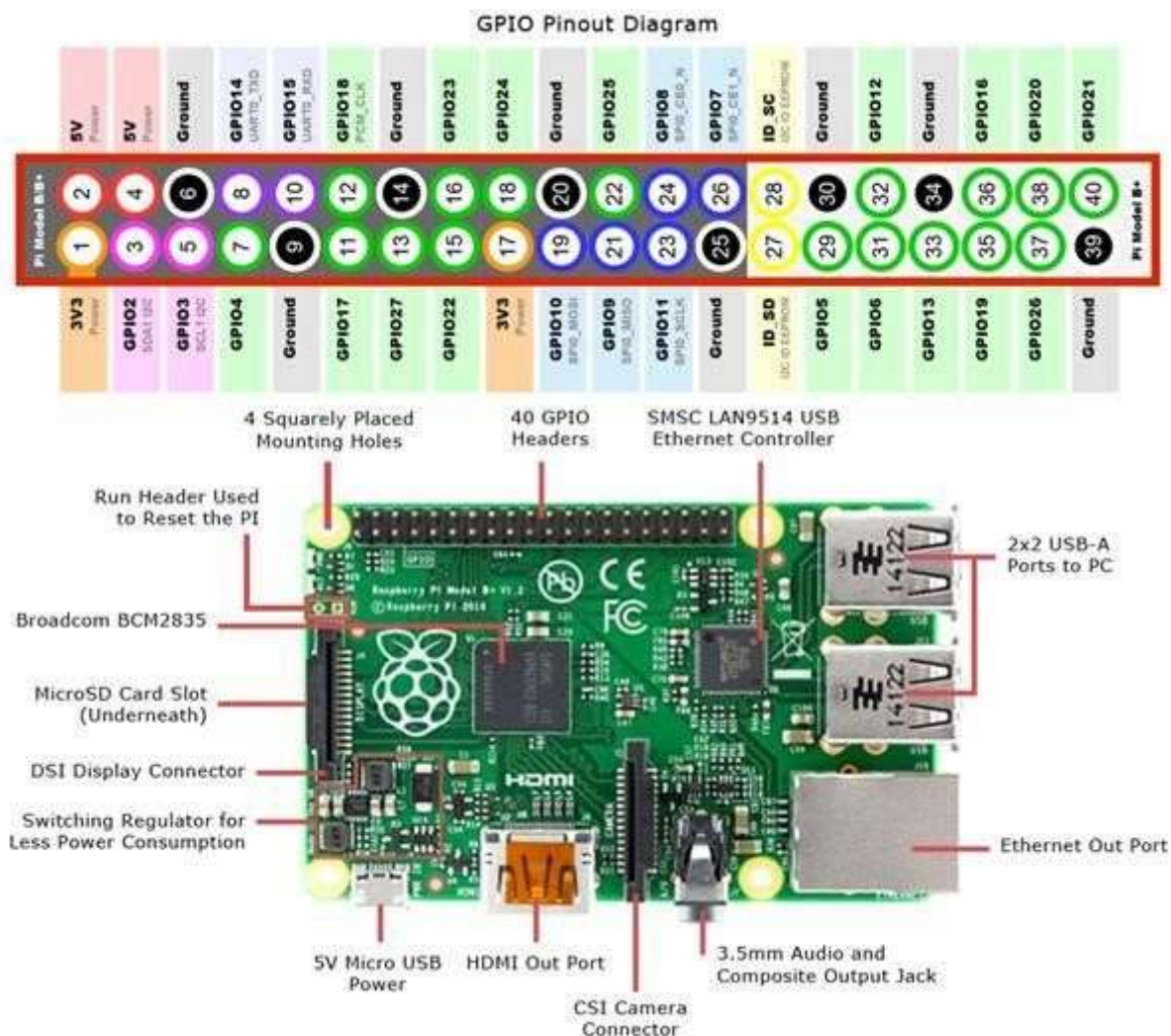
## Practical – 18

**Aim:** Getting started with Raspberry Pi and OS Installation.

### What is Raspberry Pi?

- Raspberry Pi is defined as a minicomputer the size of a credit card that is interoperable with any input and output hardware device like a monitor, a television, a mouse, or a keyboard – effectively converting the set-up into a full-fledged PC at a low cost. This article discusses the Raspberry Pi models available today, their key features, and use cases.

### Raspberry Pi Structure:



### Components of Raspberry Pi:

- **ARM CPU/GPU** – This is the processor of the computer, which handles the main data as well as graphics. The first is the main processor, which is a Broadcom BCM2835 System on a Chip (SoC). The GPU or Graphics Processing Unit, on the other hand, comprises of all the necessary graphic operations, such as those required for general display, or to a certain extent, even gameplay.
- **RAM** – The RAM or Random Access Memory is a temporary memory present on the Raspberry Pi. It is a volatile memory, allowing for temporary storage, just like it would be in the case of a regular computer. As for the size of the RAM, the memory varies and currently comes in three options, namely, 2GB, 4 GB, and 8 GB.
- **GPIO** – This is an input and output connection port, which is meant for connecting external hardware, depending on the nature of its purpose.
- **RCA** – An RCA is a cable, also referred to as a phone connector, used for connecting two different devices and carrying video or audio signals. In the case of the Raspberry Pi, it can be used to connect the device to analog televisions and other such related devices.
- **LEDs** – LEDs or Light Emitting Diodes, present in the chip, provide an indication the computer is active and running.
- **Headphones** – This is a port that can be used to connect to an external audio device, which ranges from headphones to speakers. It is a standard 3.55 mm jack, which only allows for output, meaning that there is currently no option for audio input.
- **USB** – The USB or Universal Serial Bus is a standard USB port that can be used to connect with any other device that is compatible and USB-ready. The presence of a USB allows for the Raspberry Pi to be connected to a wide range of devices, such as keyboards, mice, flash drives, external hard drives, joysticks, and computers of all kinds, including desktops, tablets, laptops, netbooks, etc.
- **Power** – This is the main power connector, which connects a 5v Micro USB slot to a compatible power source.
- **HDMI** – The HDMI cable is a connector that allows you to connect the Raspberry Pi to high definition monitors, televisions, and other such devices, through the use of a suitable HDMI port.
- **Ethernet** – This is a port that allows one to connect the computer to the internet through wired network access. At the same time, however, this feature is currently limited to Model B, while other variants lack the same.
- **SD Card Slot** – A full-sized card slot, it permits one to use standard memory cards on the device. In addition to this, it also serves another important function, which is the installation of an OS, given that one needs a bootable memory card to install an operating system on it.

### **Working of Raspberry Pi:**

- Raspberry Pi is a programmable device. It comes with all the critical features of the motherboard in an average computer but without peripherals or internal storage.
- To set up the Raspberry computer, you will need an SD card inserted into the provided space. The SD card should have the operating system installed and is required for the computer to boot.

- Raspberry computers are compatible with Linux OS. This reduces the amount of memory needed and creates an environment for diversity.
- After setting up the OS, one can connect Raspberry Pi to output devices like computer monitors or a High-Definition Multimedia Interface (HDMI) television. - Input units like mice or keyboards should also be connected. This minicomputer's exact use and applications depend on the buyer and can cover many functions.

**CODE:**

```
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)

GPIO.setwarnings(False)
GPIO.setup(18,GPIO.OUT)

While(True):

    print "LED on"

    GPIO.output(18,GPIO.HIGH)

    time.sleep(1)
    print
    "LED off"

    GPIO.output(18,GPIO.LOW)

    time.sleep(1)
```

**OUTPUT:**