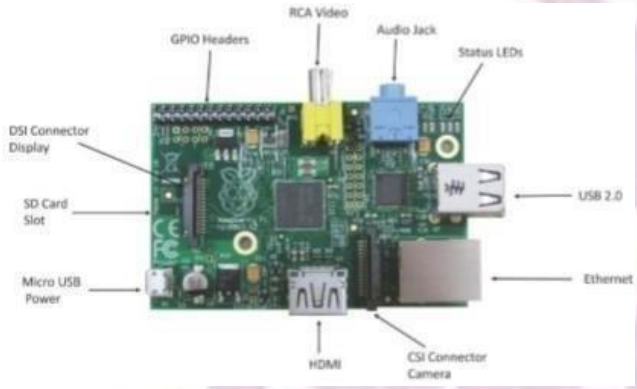
UNIT– 4

Introduction to Raspberry Pi
Raspberry Pi GPIO Pin Description
Basic building blocks of IOT Device
Raspberry Pi interfaces
Other IOT devices

Introduction to RaspberryPi

Raspberry Piisa low-cost mini-computer with the physical size of a creditcard. RaspberryPi runs various flavors of Linux and can perform almost all tasks that a normal desktop computer can do. Raspberry Pi also allows interfacing sensors and actuators through the general purpose I/O pins. Since RaspberryPirunsLinuxoperatingsystem,itsupportsPython"outofthebox".RaspberryPiisalow-costmini-computer with the physical size of a credit card. Raspberry Pi runs various flavors of Linux and can perform almost all tasks that a normal desktop computer can do. Raspberry Pi also allows interfacing sensors and actuators through the general purpose I/O pins. Since Raspberry Pi runs Linux operating system, it supports Python "out of the box".

RaspberryPi



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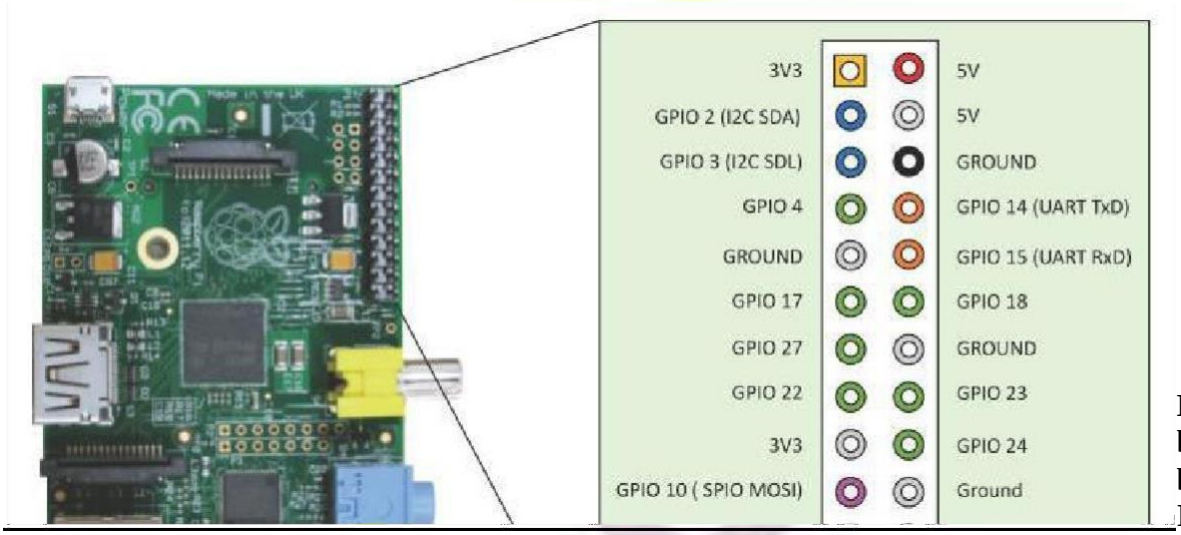
CourseName:INTERNETOFTHINGS **CourseCode:CS724PE**
Year/Sem:IV-I Regulation:R18

RaspberryPiGPIOPinDescriptionRaspberryPiGPIO

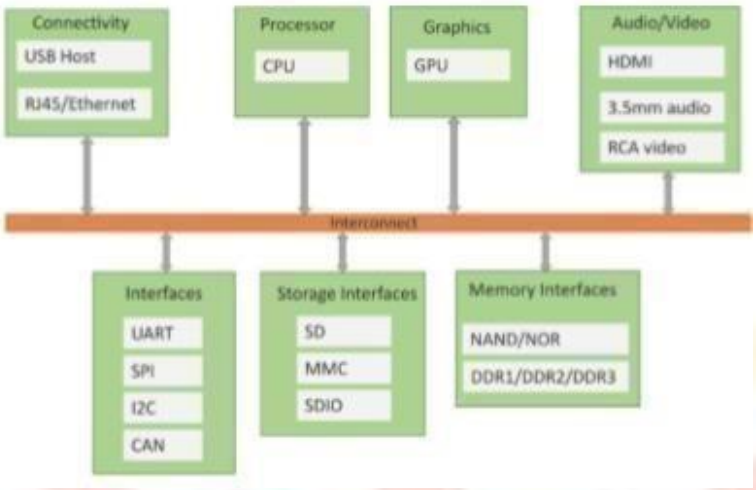


Basic building blocks of IOTDevice

Basicbuilding blocksofanIoTDevice

Sensing: Sensorscanbeeitheron-boardtheIoTdeviceorattachedtothedevice.
Actuation: IoT devices can have various types of actuators attached that allow taking actions upon the physical entities in the vicinity of thedevice.
Communication: Communication modulesareresponsible for sending collected datatootherdevices or cloud-based servers/storage and receiving data from other devices and commands from remote applications.

Analysis & Processing: Analysis and processing modules are responsible for making sense of the collected data.



BlockdiagramofanIoTDevice

Raspberry Pi interfaces

Serial:The serial interface on Raspberry Pihasreceive(Rx)and transmit(Tx)pinsfor communication with serial peripherals.
SPI: Serial Peripheral Interface (SPI) is a synchronous serial data protocolused for communicating with one or more peripheral devices.
I2C: TheI2C interface pins onRaspberryPiallow youto connect hardware modules. I2C interface allows synchronous datatransfer with just two pins - SDA (data line)and SCL (clock line)