IOT & Applications

Module - 4

IoT using Arduino: Raspberry Pi

What is Raspberry Pi

▸ The Raspberry Pi is a credit-card sized computer that plugs into your TV and a keyboard.

▸ It's a capable little PC which can be used for many of the things that your desktop PC does.

▸ Created by Eben Upton CEO of Raspberry Pi Foundation

▸ Raspberry Pi Foundation goal is to see it being used by kids all over the world to learn programming.
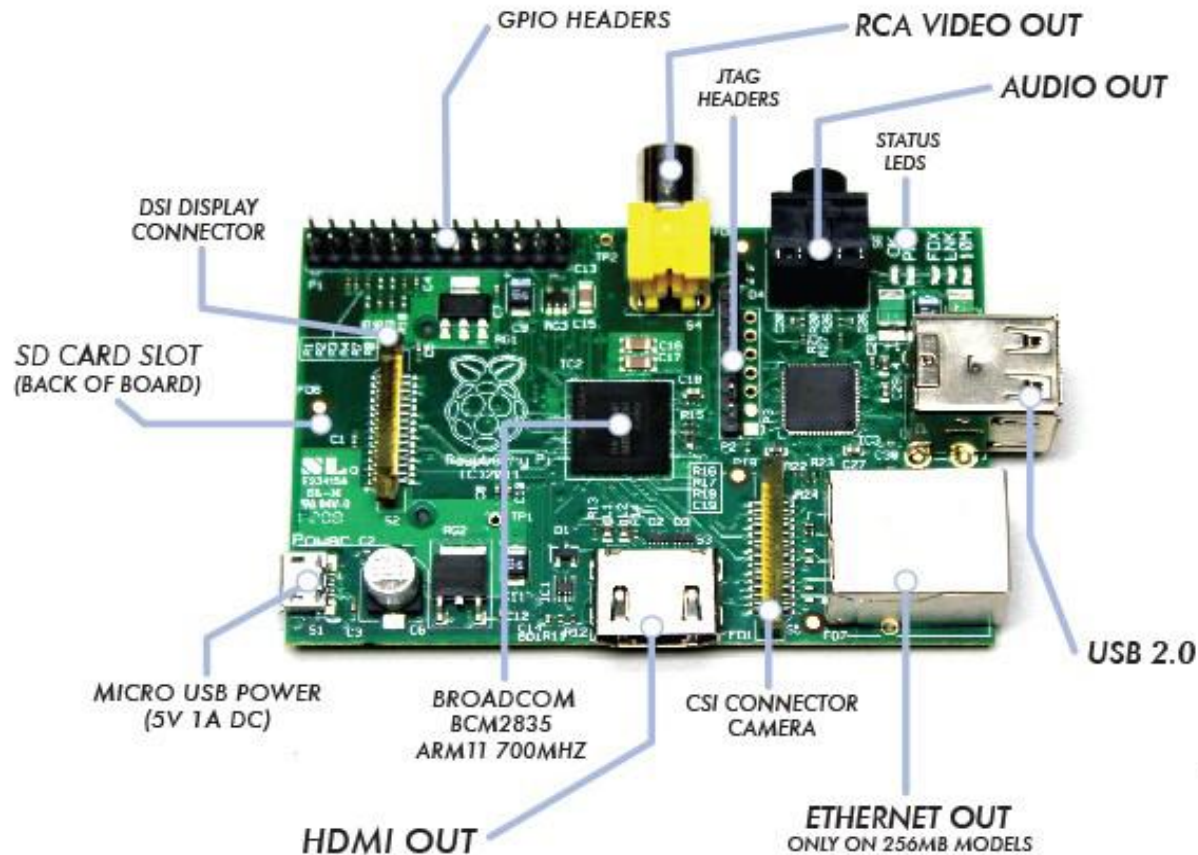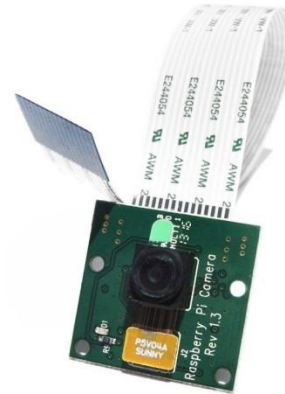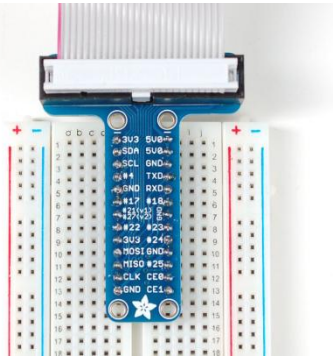
▸ Various versions of Raspberry Pi

Operating Systems

gentoo linux™

RISC OS

Plan 9 from Bell Labs

debian
GNU/Linux

openelec
embedded linux entertainment center

freeBSD

archlinux

inferno
PI EDITION

NetBSD

fedora
remix

OpenWrt
Wireless Freedom

Raspberry Pi hardware

External Hardware Interfacing

Set up your Raspberry Pi

- SD card (Minimum size 4 Gb, recommended 8 Gb)
- HDMI to HDMI / DVI lead
- RCA video lead (If you are not using the HDMI output)
- Keyboard and mouse   (USB 2.0)
- Ethernet network cable (optional)
- Power adapter (Micro USB**)**
- Audio lead

Setup Procedure

Booting of Raspberry Pi

- Download NOOBS
- Format the SD card and copy the NOOBS to SD card
- Setup the Raspberry Pi device
- Install the OS
- raspi-config
- Log in
- startx
- Now system reboots normally

Programming in Raspberry Pi

- Python (Primary programming language)
- Java
- C/C++
- HTML5
- JavaScript
- Scratch (Mathematical and computational concepts)
- JQuery (JavaScript library)
- Perl
- Erlang

Application of Raspberry Pi

▶ Supercomputer

▶ Developed by Prof Simon Cox of the University of Southampton

▶ Calculating Pi was the first test

▶ System has 64 processors and 1TB of memory

▶ Each Raspberry Pi has 16 Gb of SD card
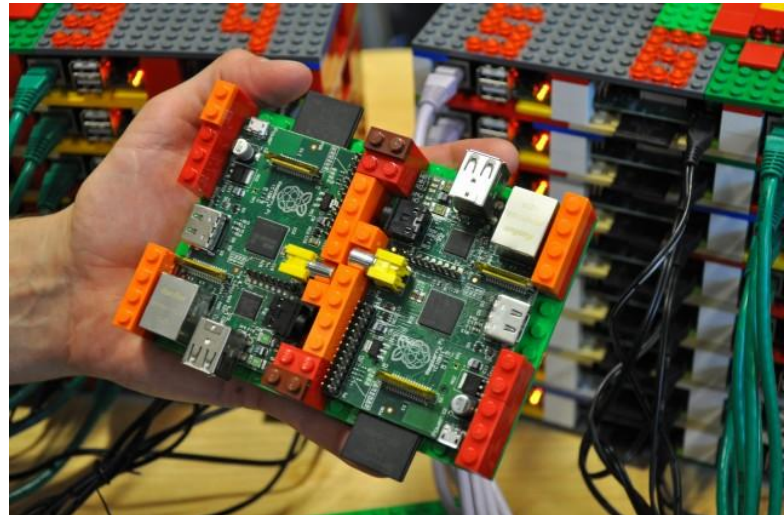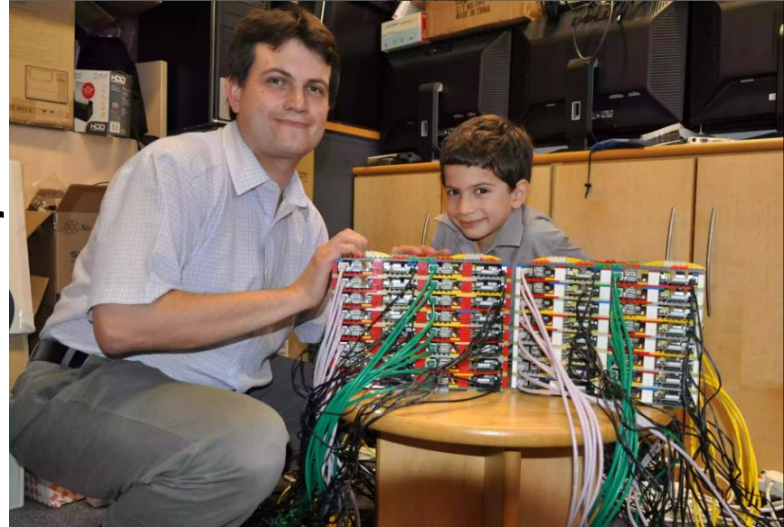
Robots and Drones

Other Applications

▸ VS-Pi server

▸ Media streamer

▸ Home automation

▸ Cosmic computer

▸ Tablet computer

▸ Game stations

What's makes it special?

▸ Low price

▸ Open-source

▸ Low power consumption

▸ Small size

▸ Over clocking

▸ No need of heat-sink

▸ Connect to old analogue TV

▸ Supports 1080p HD video

What's new?

Raspberry Pi 2 Model B

▸ 900 MHz quad-core ARM Cortex-A7 processor

▸ 1 Gb SDRAM

▸ 4.5 W power

▸ Supports OS same as for Raspberry Pi 1, plus Windows 10, Ubuntu and Android

References

- www.raspberrypi.org
- en.wikipedia.org/wiki/Raspberry_Pi
- www.slideshare.net/ltg_oxford/raspberry-pie-an-introduction
- www.cabbagesofdoom.blogspot.in
- www.techrepublic.com
- www.paw.princeton.edu
- www.jasperproject.github.io

THANK YOU