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IoT
Assignment - 02

Q. What is arduino? What are features of arduino and explain its working?

-ANS Arduino is an open-source electronics platform based on easy-to-use hardware & software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a twitter message - and turn it into an output, activating a motor, turning on an LED, publishing something online.

features →

(i) Inexpensive → Arduino boards are relatively inexpensive compared to other microcontroller platforms.

(ii) Cross-platform → The Arduino software (IDE) runs on windows, Macintosh OSX, and LINUX operating systems.

(iii) Simple, clear programming environment → The Arduino software (IDE) is easy-to-use for beginners, yet flexible enough for advanced users to take advantage of as well.

(iv) open source & extensible software ⇒ The arduino software is published as open source tools, available for extension by experienced programmers.

(v) open source & extensible hardware ⇒ The plans of the arduino boards are published under a creative commons license.

working ⇒

* The arduino is a board based on an ATMEL AVR microcontroller.

* The arduino microcontroller has comm^{n} ports & input/output ports, with which we can connect different types of peripherals on the board.

* The info^{n} of these peripherals that you connect will be transferred to the microcontroller, which will be in charge of processing the data that comes through them.

* on the other hand Arduino provides us with software consisting of a developent environment (IDE) that implements the arduino the programming language.

* Arduino is a project & not a specific model.

of board, which means that sharing its basic design you can find different type of boards.

Q2. What is Raspberry Pi with features and explain its working with figure ?

Ans. The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard & mouse. It is a capable little device that enables people of all ages to explore computing.

features →

* 512 MB SDRAM Memory
* Broadcom BCM2835 SOC full high definition multimedia processor.
* Dual-core Video Core IV multimedia coprocessor.
* Single 2.0 USB connector.
* HDMI (rev 1.3 & 1.4) composite RCA (PAL & NTSC) Video out.
* 3.5 mm Jack, HDMI Audio out.
* MMC, SD, SDIO card slot on board storage.

working →

* The operating system for all Raspberry Pi products is Linux.

* The language used with Raspberry Pi is python- a general purpose & high level programming language used to develop graphical user interface (GUI) applications, websites and web applications.

* The most basic model is the Raspberry Pi zero or Raspberry Pi zero w - the zero w comes with wifi & Bluetooth capabilities while the zero does not.

* The basic model provides the users the opportunity to learn the computer language & explore the Internet of Things (IoT) with projects designed to keep the learner engaged.

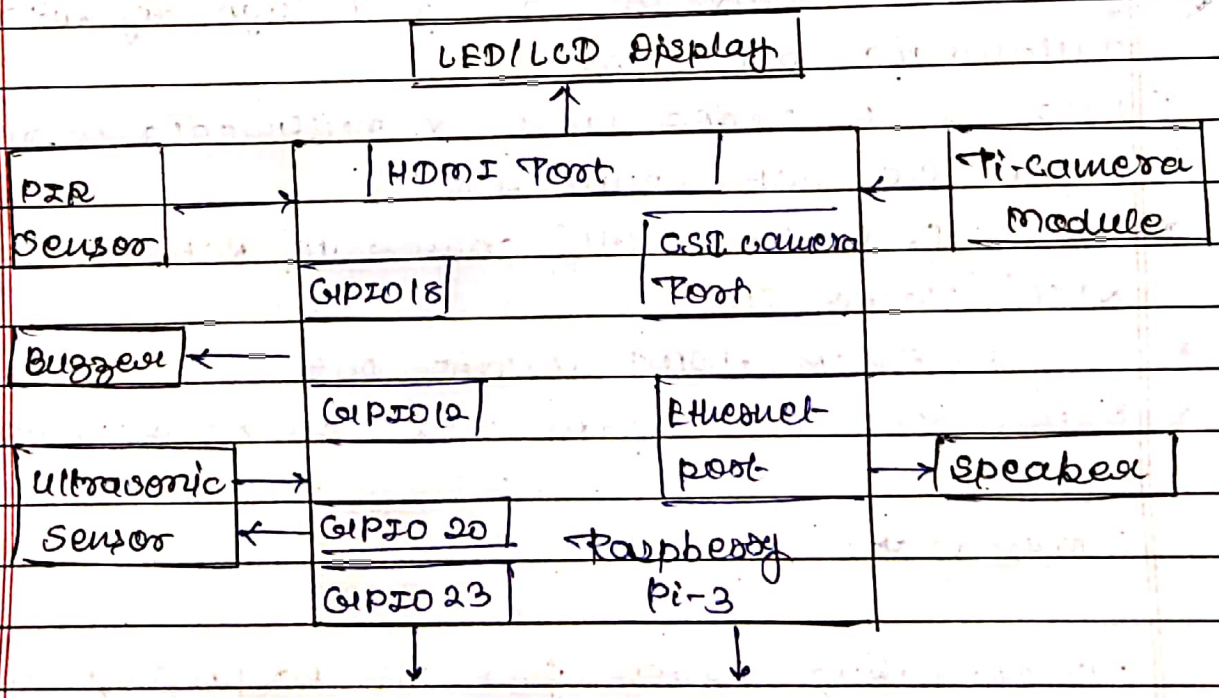

fig: Block diagram of Raspberry Pi-3

Ans(3) (i) LiteOS ⇒ LiteOS is a lightweight, open source IoT device and smartphone OS from the chinese smartphone manufacture Huawei.

* The OS also serves as a smart device development platform.

* The platform simplifies IoT device development & connectivity, while also focusing on enhancing user experience (UX)

(ii) RIOT OS ⇒ RIOT operating system is an open source OS specialized for IoT devices.

* RIOT enables developers familiar with POSIX or Linux to begin developing for IoT devices with no learning curve.

* It was developed by a world-wide grassroots community of companies, academic & hobbies.

(iii) Tiny OS ⇒ Tiny OS is an embedded, component-based operating system & platform for low-power wireless devices, such as those used in wireless devices.

* Tiny OS has been adopted by thousands of developers, worldwide on many platforms, for a broad range of wireless sensor networks.

Q4. What are the various applications of arduino & raspberry Pi ?

Ans.

Applications of Raspberry Pi →

(i) Raspberry Pi based motor speed control.
(ii) Auto-intensity control of street lights by using Raspberry Pi.
(iii) Programmable sequential switching by using Raspberry pi.
(iv) Raspberry Pi based solar street lights.
(v) Synced music & christmas lights.

Applications of Arduino →

(i) weighting machines.
(ii) Traffic lights count down timer.
(iii) Parking lot counter.
(iv) Embeeded systems.
(v) Home automation
(vi) Medical Instrument
(vii) Emergency light for railways.