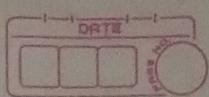


Experiment No: 1



Aim: Study of Raspberry Pi, Beagle board, Arduino and other micro controller (History and Elevation)

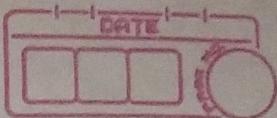
Theory:

Study of Raspberry Pi 3

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside of its target market for uses such as robotics. Over 5 million Raspberry Pis have been sold before February 2015, making it the best-selling British computer. By November 2016 they had sold 11 million units.

The first generation was released in Feb 2012, followed by the simpler and cheaper model A. In 2014, the foundation released a board with an improved design, Raspberry Pi 2 Model B+. These boards are approximately credit card sized and represent the standard mainline form-factor. Improved A+ & B+ models were released a year later.

A Raspberry Pi zero will fit smaller size and reduced input output & general-purpose (I/O) (GPIO) capabilities was released in November 2015 for



U.S.\$5. Raspberry Pi 3 Model B was released in February 2016 and has on-board Wi-Fi, Bluetooth and USB Boot capabilities. By 2017 it became the newest mainline Raspberry Pi. On 28 February 2017 the Raspberry Pi zero W was launched, which is like Raspberry Pi zero with Wi-Fi and Bluetooth for \$5. Its processor speed ranges from 100MHz to 1.2GHz from the Pi 3; on board memory ranges from 256MB to 1GB RAM. SD/MMC Digital cards are used to store the operating system and program memory in either SDHC or microSD sizes. The boards have one to four USB ports, four video output, HDMI & Composite Video are supported. With a standard 3.5mm phone jack, four audio output. Lower-level output is provided by a number of GPIO pins which support common protocols like I2C. The B-Models have an 8P8C Ethernet port & the Pi 4 Pi Zero W have on board Wi-Fi 802.11n and Bluetooth. Prices range U.S.\$5 to \$35.





History and Elevation

In 2006, early concepts of the Raspberry Pi were based on the Atmel ATmega 644 microcontroller. Its schematics and PCB layout were publicly available. Foundation trustee Eben Upton assembled a group of teachers, academics and computer enthusiasts to devise a computer to inspire children. The computer is inspired by Acorn's BBC model of 1981. The Model A, Model B and Model B+ names are references to the original models of the British educational BBC micro computer, developed by Acorn computers. The first ARM proto-type version of the computer was mounted in a package the same size as a USB memory stick. It had a USB port on one end and an HDMI port on the other.

The foundation's goal was to offer two versions, priced at US \$25 and \$35. They started accepting orders for the higher priced model B on Feb 29 2012, the lower cost model A on 4 Feb 2013, and the even lower cost (US \$20) A+ on 10 November 2014. On 26 November 2015, the cheapest Raspberry Pi yet, the Raspberry Pi zero, was launched at US \$5 or £4.

Study of Beagle board

The Beagle Board is a low-power open-source single-board computer produced by Texas Instruments in association with Digi-Key and New Element 14. The Beagle Board was also designed with open source software development in mind, and as a way of demonstrating the Texas Instrument's OMAP3530 System-on-a-chip. The board was developed by a small team of engineers as an educational board that could be used in colleges around the world to teach open source hardware and software capabilities. It is also sold to the public under the Creative Commons Share-alike license. The board was designed and manufactured using Cadence OrCAD for schematics and Cadence Allegro for PCB manufacturing; no simulation software was used.

fig 2. Beagle Bone Kit



Fig.2. Beagle Bone Kit

Study of Arduino.

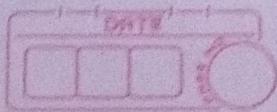
The Arduino project started at the Interaction Design Institute Ivrea (IDI) in Ivrea, Italy. At that time, the students used a BASIC Stamp microcontroller at a cost of \$100, a considerable expense for many students. In 2003, Hernando Barragán created the development platform wiring as a Master's thesis project at IDI, under the supervision of Massimo Banzi and Casey Reas, who are known for work on the Processing language. The project goal was to create simple, low-cost tools for creating digital projects by non-engineers. The wiring platform consisted of a printed circuit board (PCB) with an ATmega168 microcontroller, an IDE based on Processing and library functions to easily program the microcontroller. In 2003, Massimo Banzi, with David Mellis another IDI student, and David Cuartielles, added support for the cheaper ATmega8 microcontroller to wiring. But instead of continuing the work on wiring, they forked the project and renamed it Arduino.

The initial Arduino core team consisted of Massimo Banzi, David Cuartielles, Tom Igoe, Gianluca Martino & David Mellis, but Barragan was not invited to participate.

Adafruit Industries, a New York City supplier of Arduino boards parts and assemblies, estimated in mid-2011 that over 300,000 official Arduinos had been commercially produced. [6] and in 2013 that 700,000 official boards were in user's hands.

In October 2016, Federico Musto, Arduino's founder CEO, secured a 50% ownership of the company. In April 2017, wired reported that Musto had fabricated his academic record on his company's website personal linked in accounts. Even on Italian business documents, Musto was until recently listed as holding a PhD from the Massachusetts Institute of Technology. In some cases, his bios also claimed an MBA from New York University. wired reported that neither university had any record of Musto's attendance and Musto later admitted in an interview with wired that he had never earned those degrees.

Around that same time, Massimo Banzi announced that the Arduino foundation would be "a new beginning for Arduino." But a year later, the foundation still hasn't been established and the state of the project remains unclear. The controversy surrounding Musto continued when, in July 2017, he reportedly pulled many open source licenses' schematics, and code from the Arduino website, prompting security and outcry. In



October 2017, Arduino announced its partnership with ARM Holdings (ARM). The announcement said, in part, "ARM recognized independence as a core value of Arduino without any lock-in with the ARM architecture." Arduino intends to continue to work with all technology vendors & architectures.

Fig 3 Arduino kit

Conclusion:

Thus, we have studied history of Raspberry Pi, Beagle bone and Arduino.

