Assignment A1

Title : Study of Raspberry-Pi, Beagle Board, Arduino and other micro controller

Problem Statement: Study of Raspberry-Pi, Beagle Board and other micro controller (History and evaluation)

Software and Hardware Requirements:

Raspberry-Pi, Beagle Board,
PC with configuration as
Latest version of 64 bit OS, Open source Fedora-GHz.
8 GB RAM, 500 GB HDD, 15" Color Monitor, Keyboard, Mouse

Learning Objectives:

To develop comprehensive approach towards building small low cost embedded IOT system.

Theory:

Raspberry-Pi:

The Raspberry-Pi is a series of small single-board computers developed in the UK by the Raspberry-Pi Foundation to promote the teaching of basic computer science in schools and in developing countries.
It does not include peripherals (such as keyboards, mouse and cases). However, some accessories have been included in several official and unofficial bundles. Over 5 million Raspberry-Pi were sold by Feb 2015 making it the best-selling British computer.

Beagle Board:

The Beagle Board is a low-power open-source single-board computer produced by Texas Instruments in association with Digi-Key and Newark element 14.
The BeagleBoard was also designed with open source software development in mind, and as a way 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 using Cadence OrCAD for schematics and Cadence Allegro for PCB manufacturing.

Arduino:

Arduino is an open source computer hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world.

The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

Program Structure:

A minimal Arduino C/C++ program consists of only two functions:

(i) setup(): This function is called once when a sketch starts after power-up or reset. It is used to initialize variables, input and output pin modes, and other libraries needed in the sketch.

(ii) loop(): After setup() has been called, function loop() is executed repeatedly in the main program. It controls the board until the board is powerid off or reset.

Applications:

(i) Arduboy, a handheld game console based on Arduino
(ii) Arduino Motion Control Rig
(iii) Arduinome, a MIDI controller device that mimics the Monome
(iv) Ardupilot, drone software and hardware
(v) DC Motor using Arduino and H-bridge

and Many more applications are provided by Arduino

Conclusion: Raspberry Pi, Beagle Board, Arduino and other micro controllers were studied.