SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT308-WIRELESS TECHNOLOGIES FOR IoT

III YEAR/ VI SEMESTER

UNIT 4 – PROTOTYPING AND DESIGNING SOFTWARE FOR IOT APPLICATIONS

TOPIC – PROTOTYPING EMBEDDED DEVICE SOFTWARE

Prototyping development of the programs

- Prototyping development of the programs requires bootloader, OS and IDE.
- Software embeds into a device platform.
- An IDE enables development of software for functions of data gathering, consolidation, and connection to Internet.
- The IDE may also enables the use of OS or RTOS functions at an embedded device.
- Bootloader stores at flash/ROM of a microcontroller device and enables communication with a computer having an IDE.
- IDE has APIs, libraries, compilers, RTOS, simulator, editor, assembler, debugger, emulators, logic analyzer, code burner.
- IDE enables the development of codes on a computer and downloads the codes on to an embedded device.
- The code burner places codes into flash memory or EEPROM or EPROM.
- Hence the application code is embedded into the device.

Prototyping and Designing the software for IoT Applications

- **What is Prototyping**?
- It is the process of building **IoT** hardware and devices enhanced with smart sensors and embedded systems using many off-the-shelf components like sensors, circuit boards, and microcontrollers.

- Develop the codes, design and test the embedded devices for IoT and M2M using IDEs and development platform

- To develop IoT software five levels are needed.
  1. Gather+Consolidate
  2. Connect
  3. Collect+Assemble
  4. Manage and Analyse
  5. Applications and Services.

PROTOTYPING EMBEDDED DEVICE SOFTWARE.

- IDE(Integrated development environment) enables development of software at first and second level for embedding into device platform.

- IDE enables development of codes on a computer, and later on downloading of codes on to embedded device, such as Arduino or microcontroller boards.

Programming Embedded Device Arduino Platform using IDE.

- An **Integrated Development Environment** (IDE) is software for building applications that combines common developer tools into a single graphical user interface (GUI).

- **IDE**, or Integrated Development Environment, is a software application that combines all of the features and tools needed by a software developer

- The **Arduino** Integrated Development Environment (**IDE**) is the main text editing program used for **Arduino** programming. ... Essentially, the **IDE** translates and compiles your sketches into code that **Arduino** can understand. Once your **Arduino** code is compiled it's then uploaded to the board's memory.

Programming Embedded Device Arduino Platform using IDE.

- Arduino board can be programmed using avr-gcc tools.

- Arduino board has a pre-installed bootloader embedded in to the firmware.

- Arduino programmer develops codes using graphical cross-platform IDE.

- Arduino board connects to a computer which runs IDE.

- IDE consists of set of software modules, which provide the software and hardware environment for developing and prototyping the software for a specific device platform.

- Bootloader enables computer to push the developed codes into board using Arduino IDE through USB cable.