Lesson 2
Embedded Software

Software

- Consists of instructions, commands and data

- Software in a computing and communicating Device

- Includes bootloader

- May include the OS functions or need the loading of the OS from external flash or hard disk

Embedded Device Software

- Device embedded software also includes the device APIs and middleware

- Enables the device to perform computing and communication functions

Bootloader

- Must for system start and self-test

- Initiates load of the software

- Enables running of the applications and services

- May also facilitate the use of system hardware and networking capabilities

Bootloader

- Bootloader loading of the OS may be from an external source

- Alternatively, bootloader can itself posses basic function of system software, when the codes for IO functions and OS basic system functions happen to be from same source.

Operating system (OS)

- Facilitates the use of system hardware and networking Capabilities

- When load of the OS into RAM completes then MCU starts the normal operational runtime-environment.

OS for the Processes, tasks and threads

- When the device is executing multiple tasks or threads, then also an OS required

- The OS controls the multiple processes and device functions.

- Control the set of run and scheduling of process instructions (or tasks or threads)

- Different processes memory allocation by OS

- Prioritizing of the processes

OS

- Enables use of network hardware, device hardware functions and execution of software components and processes

- Loads at flash memory of the device or required to load functions at the device RAM

Open Source OS

- For example, Linux or its distribution

- Linux distribution, a package or set of software components and modules bundled together for specific functions or for specific hardware, and distributed for wider usages and applications.

Arduino Linux distribution

- Runs in Arduino circuit boards

- Enables the Linux functions for developing the application programs for using the Arduino.

Summary

We learnt

- Software instructions, commands and data

- Embedded Device software

- Bootloader Functions

- Operating system functions

- Processes, tasks and threads

- Linux distribution

End of Lesson 2 on Embedded Software