Embedded Software development Process and Tools:

Lesson-1

Introduction to Embedded Software Development Process and Tools
1. Development Process and Hardware—Software
Development Process

- Consists of cycles of editing-testing-debugging.
- Processor and hardware part once chosen remains fixed, the application software codes have to be perfected by a number of runs and tests.
Cost of developing a final targeted system

- While the cost of the processor is quite small, the cost of developing a final targeted system is quite high.
- Needs a larger time frame than the hardware circuit design.
Development process of an embedded system

- Hardware Selection
- Assembly for Target System
- Test Hardware
- Burn Codes using Device Programmer

- Software
  - Develop using Edit - Test - Debug Cycles Till Test Results O.K.

- Development Phase
- O.K.
- Reassemble on Hardware Error
  - Yes
- End
  - Yes
- Redesign on Software Errors
Edit-Test-Debug Cycle implementation phase of the development process
2. Software Tools
Software Tools

- Software Development Lit (SDK)
- Source-code Engineering Software
- RTOS
- Integrated Development Environment
- Prototyper
- Editor
- Interpreter
Software Tools …

- Compiler
- Assembler
- Cross Assembler
- Testing and debugging tools
- Locator
3. Source Code Engineering Tool
Typical tool Features

- Comprehension,
- Navigation and browsing,
- Editing,
- Debugging,
- Configuring (disabling and enabling specific C++ features)
- Compiling
Typical tool Features...

- Searches and lists the definitions, symbols, hierarchy of the classes, and class inheritance trees
- Symbols include the class members
- Searches and lists the dependencies of symbols and defined symbols, variables and functions
Typical tool Features ...

- Monitors, enables and disables the implementation virtual functions.
- Finds the full effect of any code change on the source code.
- Searches and lists the dependencies and hierarchy of included header files.
Typical tool Features ...

Navigates to and fro—

- between the implementation and symbol declaration.
- between the overridden and overriding methods.
Typical tool Features …

Browses through

- information regarding instantiation (object creation) of a class.
- encapsulation of variables among the members
- public, private and protected visibility of the members.
- object component relationships
Typical tool Features ...

- Automatically removes error-prone and unused tasks.
- Provides easy and automated search and replacement
Summary
We learnt

- Software development process using editing, testing and debugging cycles
- Software development kit
- Source-code Engineering Software
- RTOS
- Integrated Development Environment
- Testing and debugging tools for testing and debugging
We learnt

- Number of software tools used to develop software for designing an embedded system.
- Sophisticated tools—RTOS, Integrated Development Environment and Prototype development tools needed for integrated development of system software and hardware.
End of Lesson-1 of chapter 13 on Introduction to Embedded Software Development Process and Tools