

# Testing, Simulation and Debugging Techniques and Tools:

## Lesson-6

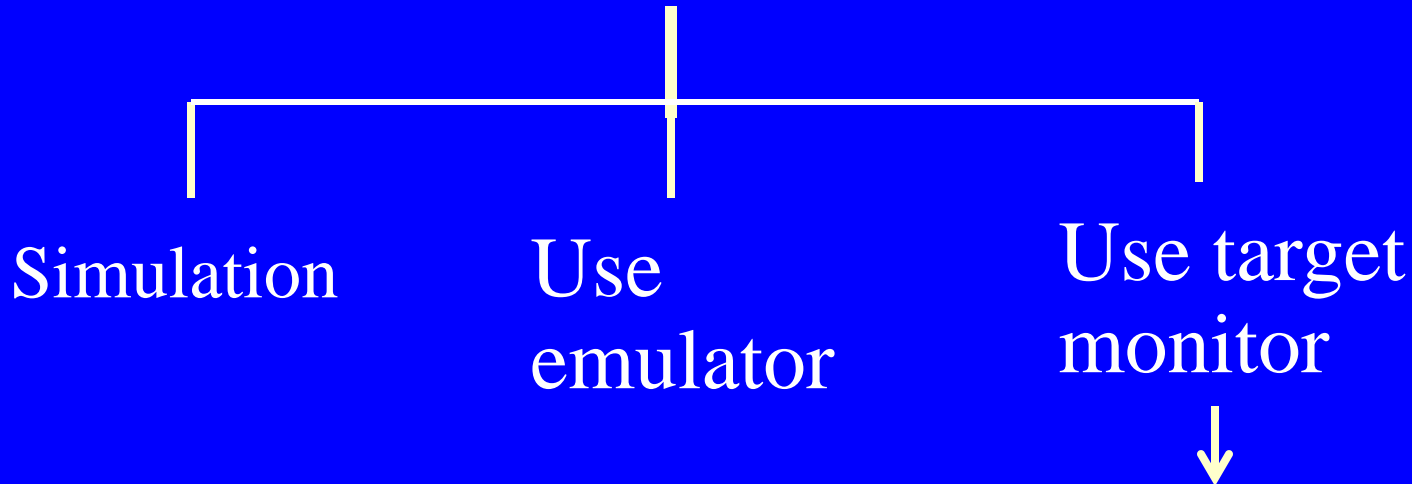
### Monitor

# Target

- Target system keyboard
- Target system driver circuit
- Monitor codes

# 1. Development processes using Monitor

# Target debugging



- A ROM resident program at the target board or ROM emulator connected to ICE
- Monitors the device applications, runs for different hardware architecture, used for debugging

# Target Monitor

- Computer (PC) interface commands
- Command interpreter
- Application codes down loaded from PC
- Data

# System Monitor functions

- Monitor loads the application codes, also used for corrections in codes and then test the system.
- A command for download can download a new application codes into the monitor.
- A command for reset the program restarts the program.
- Monitor loads the application (in hex-file) from developing system (at host) that can also be modified later to correct the codes.

# System Monitor functions...

- A part of the monitor runs on host system.
- Debug monitor codes are downloaded along with the locator binary image.
- A write and a read command is used to correct or examine the codes at the memory addresses of the system

# System Monitor functions...

- Monitor controls (inserts, removes, modifies) breakpoints as per command from debugger.
- A breakpoint partitions the program into separate segments. When a program segment runs, then there is pause at breakpoint, then test the result observed after the run and examined, and then next segment is run.
- Breakpoints enable program test running between the different program segments.



# System Monitor functions...

- To have controlled execution of instructions, application loading and codes correction
- Monitor controls (as per command from debugger) the execution of application at full speed, as well as by single stepping during debug phase.

# Target Commands

- Download into monitor
- Define Execution start address
- Define Single step execute
- Define Full speed execute
- Set breakpoints
- Reset breakpoints
- Send selected codes/ IOs info for computer display

## 2. Use of System Monitor Codes for Debugging

# Use of System Monitor Codes for Debugging

- Downloaded codes in ICE may run a 'Power On Self Test' (POST) program on bootstrapping.
- A ROM may also have a debug monitor.

# Use of System Monitor Codes for Debugging

- GNU debugger *gdb*, - a downloadable freeware - may also provide the debug monitor codes for the system

# Summary

## We learnt

- Monitor used to debug software and hardware for the given target processor or microcontroller.

# End of Lesson-6 of chapter 15 on Monitor