Embedded Systems Design

# Second Assignment

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- Second Assignment composed by 2 main parts:
  - Virtual Platform
    - Integration of Floating-point multiplications HW accelerator in COM6502-Splatters
  - SystemC TLM
    - UT,LT,AT4 Implementation of your design

**Delivery Deadline**

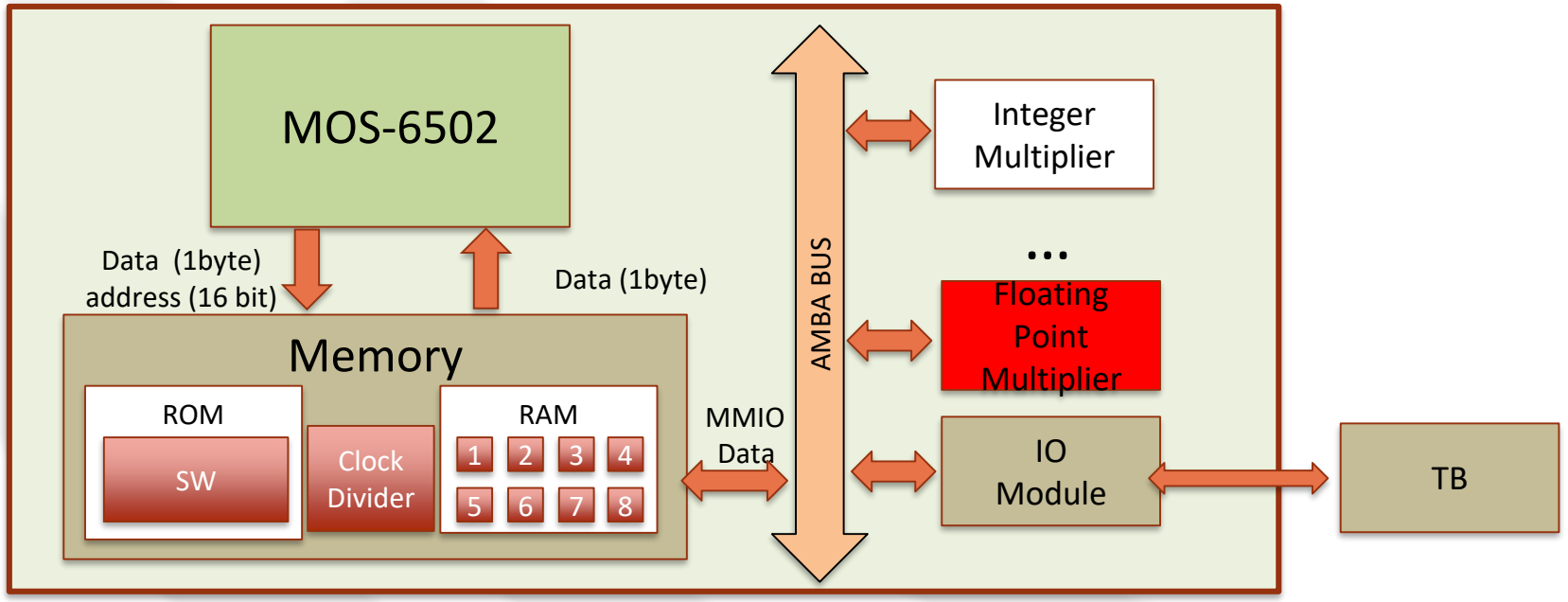
**Friday, 31st January 23:59**

Embedded Systems Design - Assignment

# 2.1 – Virtual Platform

# Virtual Platform

- Connect your Floating point multiplier to COM6502-Splatters Platform
  - Wrap your design with APB Slave interface
  - Instantiate and bind your design to APB Bus
- Write a SW Driver for your Floating Point Multiplier
  - Add new function in routines.c file and use it in main.c
  - Request at least one of four operators via I/O Module



# Report

- How do you wrap your multiplier?
  - Report port bindings (APB Wrapper- Multiplier)
  - Where do you bind the wrapped multiplier?
    - Which port of the APB bus?
  - Report the new EFSM of the APB Wrapper
- How does the driver work?
  - How does the protocol work?
    - Report a simple Sequence Diagram of the protocol
- Report simulation waveform
  - I/O Module interaction
  - Memory output ( APB Master Interface)
  - Wrapped Multiplier

Embedded Systems Design - Assignment

# 2.2 – SystemC TLM

# SystemC TLM

- Implement the Floating-point multiplications HW  at TLM
  - UT/LT/AT4 coding styles
  - **Remember:** you are now modeling the functionality at a higher level of abstraction
  - Timing annotations must be consistent with your RTL design

- Report:
  - **Briefly** explain each implementation
    - **How** do you implement the functionality?
    - **How** do you implement the protocol,and how it behaves?
  - Compare the simulation overhead…
    - …of the TLM implementations…
    - …and w.r.t. the RTL execution…
    - …and comment what you see!
      - Hint:This should let you understand why/when/where TLM is used

| | UT | LT | AT4 | RTL |
|---|---|---|---|---|
| Real Time | | | | |
| User Time | | | | |
| System Time | | | | |

# Final Structure of the Assignment

- VR123456_Stefano_Centomo_02/
  - Report/
    - VR123456_Stefano_Centomo_02.pdf
  - Solutions/
    - Virtual_Platform/
      - platform
        - » Vivado project or all source code of splatters, multiplier and testbench
      - application
        - » Source code of your application
    - TLM/
      - UT/
        - » bin, include, Makefile, obj, src
      - LT/
        - » bin, include, Makefile, obj, src
      - AT4/
        - » bin, include, Makefile, obj, src

- **Everything within VR123456_Stefano_Centomo_02.tar.bz2**