

Multimedia SoC Design

Homework of Lab 1

March 11, 2016

0. Compile and run the examples shown in the class, including *Hello_SystemC*, *gas_station*, *fifo_fir*, and *wave*. (These examples can be found in *Lab1\code\Sample_Code*)
1. Modify the *counter* example you have tested during the lab. Dump the waveform (VCD file) with **sc_trace** function. Please dump all the signals of the counter and capture the waveform shown by waveform viewer (ex: winvcd.exe) and paste it in your report.
2. The *fifo_fir* example can be shown as Fig. 1. Please modify the program as the following requirements. Please show the associated waveforms (including all important signals) in your report and attach the modified project in the ZIP file.

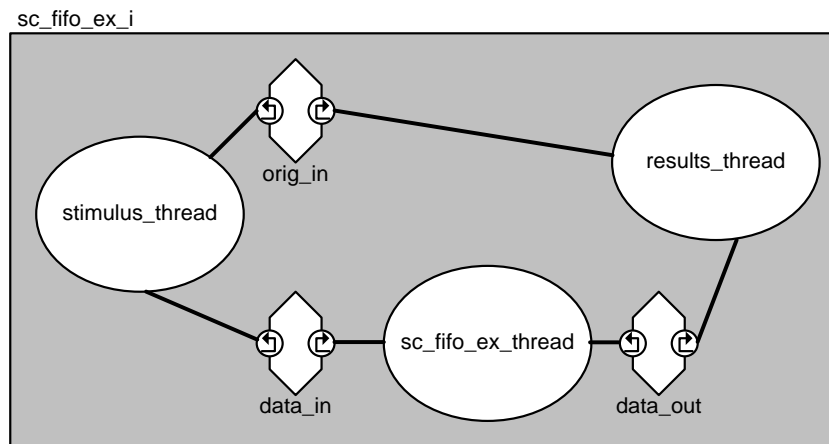


Fig. 1. *fifo_fir*.

- 1) The original stimulus is an impulse signal. Please modify it to the square wave shown in Fig. 2. Show the waveform and the printed text output in your report.

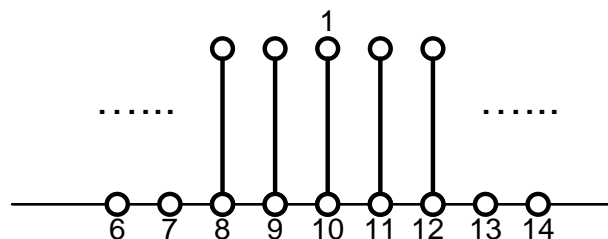


Fig. 2. Square wave.

- 2) Refer to the *counter* example. Modify *fifo_fir* as the following structure. Note that, please add a clock signal, and the module *sc_fifo_ex* should process one data at each cycle. Show the waveform and the printed text output in your report.

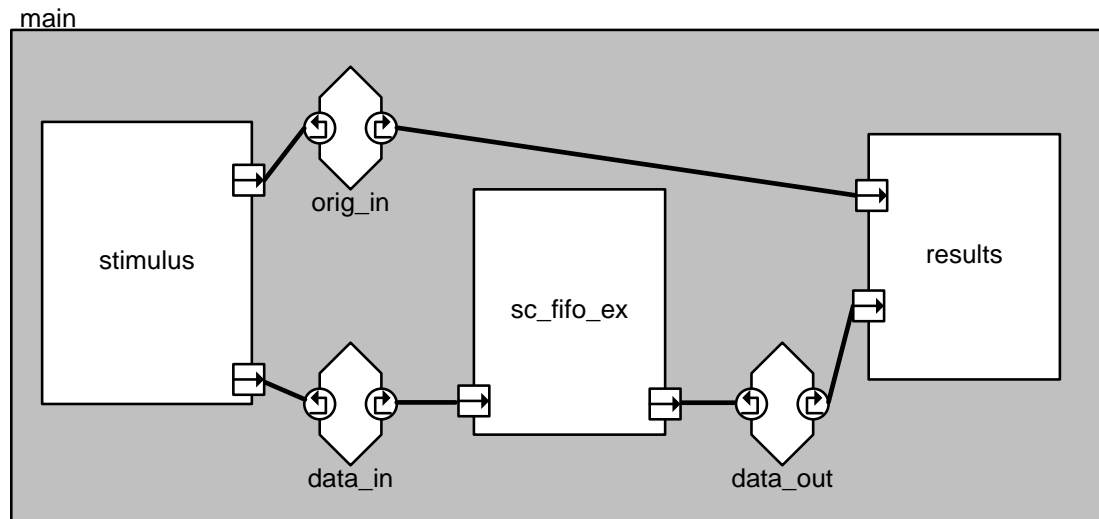


Fig. 3. New structure of *fifo_fir*.

- 3) Modify *sc_fifo_ex* to model the following pipelined FIR structure. Show the waveform and the printed text output in your report.

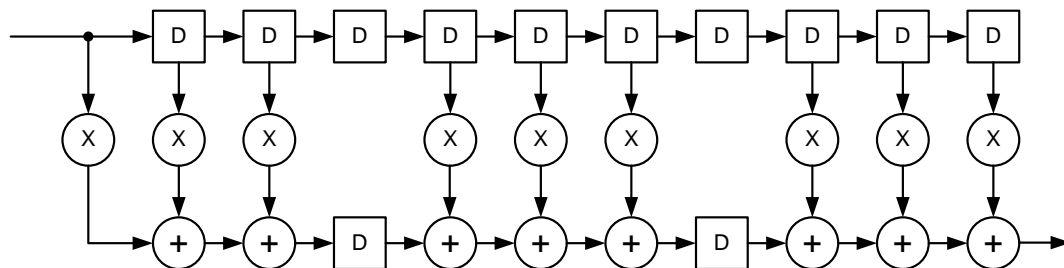


Fig. 4. Pipelined FIR architecture.

3. Draw the structure of the example *async_mem* following the style of Fig. 3.

- ✚ All the files need to be compressed as a single ZIP or RAR file.
Send this file to TA via email: ntumsoc@gmail.com

Examples of email title:

[\[MSOC\] HW1_R04901001](#)

[\[MSOC\] HW1_R04901001_Ver2](#)

Examples of filename:

[MSOC_HW1_R04901001.zip](#)

[MSOC_HW1_R04901001_Ver2.zip](#)

Due date: 2016/03/25 Before Class (2 weeks)

繳交規定

source code (包括 lab 和作業)、report in PDF

請將這些檔案放入一個資料夾內如下排放

/HW1/	放report
/HW1/Lab1/	為Lab1的專案資料夾
/HW1/problem_2_1/	為2.1的專案資料夾
/HW1/problem_2_2/	為2.2的專案資料夾
/HW1/problem_2_3/	為2.3的專案資料夾

請注意，專案資料夾內必須包含 [.vcxproj\[.*\]](#) 檔和 [.sln](#) 檔，將SystemC必須預先設定以下五項專案參數先設定好

1. VC++目錄的 Include目錄路徑 & 程式庫目錄路徑
2. `systemc.lib`
3. `_CRT_SECURE_NO_WARNINGS`
4. Multi-threaded Debug (/Mtd)
5. /vmg

➤ 為避免整份檔案過大，請在專案完成後，刪除所有的Debug資料夾，以及ipch資料夾、.sdf檔、.suo檔...等等。

➤ 最後只要留下以下檔案即可：

- *.sln (方案檔)
- *.vcxproj[.*] (專案檔)
- *.h, *.cpp (程式碼)
- *.cfg (設定檔)