2019 DCS Lab 06

Pattern

- 這次Lab寫pattern去測錯誤的design，找到其錯誤
- 這次Lab只需要寫00_TESTBED/pattern.sv
- lab06_1.sv代表第一個spec錯誤的design，依此類推。lab06.sv 是正確的design。
- lab06_x.sv & lab06.sv 都不要動到
- 可以參考之前幾次的pattern和講義

lab06.sv

Input Signal	Bit Width	Definition
clk	1	5 ns Clock for 1 cycle
rst_n	1	Asynchronous reset when reset negedge, all output should be zero
in_number	4	連續給3個數字。方便之後說明，分別用in_1、in_2、in_3代表
mode	2	幾種運算模式，請看下一頁
in_valid	1	in_valid high when giving number

Output Signal	Bit Width	Definition
out_valid	1	High for 1 cycle
out_number	7	High for 1 cycle，計算後的結果，如下頁所示

mode

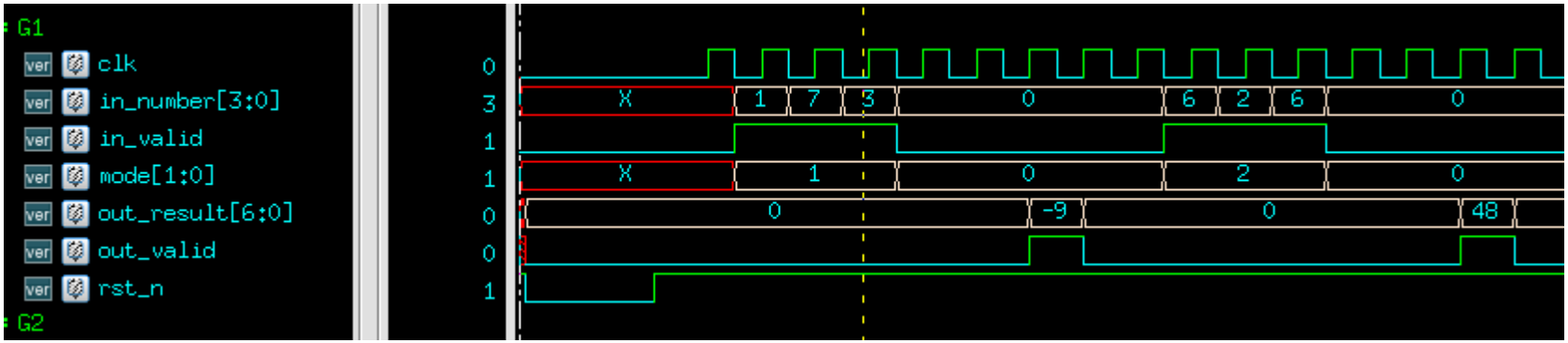
Input signal :mode	
0	out_number = in_1 + in_2 + in_3
1	out_number = in_1 - in_2 - in_3
2	out_number = (in_1 + in_2) * in_3
3	out_number = (in_1 左移 in_2) + in_3

Specifications

- Top module name : lab06 (File name: lab06.sv)
- Spec1 : reset後output signal要歸零
- Spec2 : 計算完吐完值後1cycle， out_valid要歸零 (out_valid只維持1cycle)
- Spec3 : 100cycle內要計算完成(out_valid為high)
- Spec4 : function要對(前一頁的公式會有錯要檢查出來)

Output & Waveform

- Waveform



Command

- tar -xvf ~dcsta01/Lab05.tar
- ./01_run_spec1 : run for check spec1(should display SPEC1 Fail)
- ./01_run_spec2 : run for check spec2(should display SPEC2 Fail)
- ./01_run_spec3 : run for check spec3(should display SPEC3 Fail)
- ./01_run_spec4 : run for check spec4(should display SPEC4 Fail)
- ./01_run : run for right design(should display Congratulation)
- You should Pass all spec!

Command

- 請參考pattern.sv裡這段，需要各自秀出SPEC1.2.3.4等資訊，以免助教demo時抓不到

```
// $display ("--------------------------------------------------------------------------------------------------------------------------------");
// $display ("                                                    SPEC1!                                                                      ");
// $display ("                                                    Reset                                                                       ");
// $display ("--------------------------------------------------------------------------------------------------------------------------------");

// $display ("--------------------------------------------------------------------------------------------------------------------------------");
// $display ("                                                    SPEC2!                                                                      ");
// $display ("                                          Output should be zero after check                                                      ");
// $display ("--------------------------------------------------------------------------------------------------------------------------------");


// $display ("--------------------------------------------------------------------------------------------------------------------------------");
// $display ("                                                    SPEC3!                                                                      ");
// $display ("                                       The execution latency are over 100  cycles                                             ");
// $display ("--------------------------------------------------------------------------------------------------------------------------------");

// $display ("--------------------------------------------------------------------------------------------------------------------------------");
// $display ("                                                    SPEC4!                                                                      ");
// $display ("                                       YOUR:  %d                                ",out_result);
// $display ("                                       GOLDEN: %d                                ",golden_out);
// $display ("--------------------------------------------------------------------------------------------------------------------------------");
```

Command

- tar -xvf ~dcsta01/Lab06.tar
- Upload
  - cd 09_upload
  - ./01_upload
  - ./02_download demoX