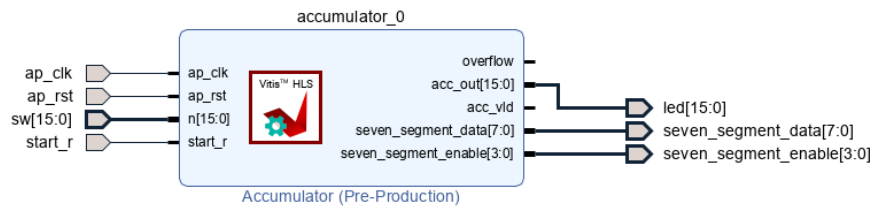


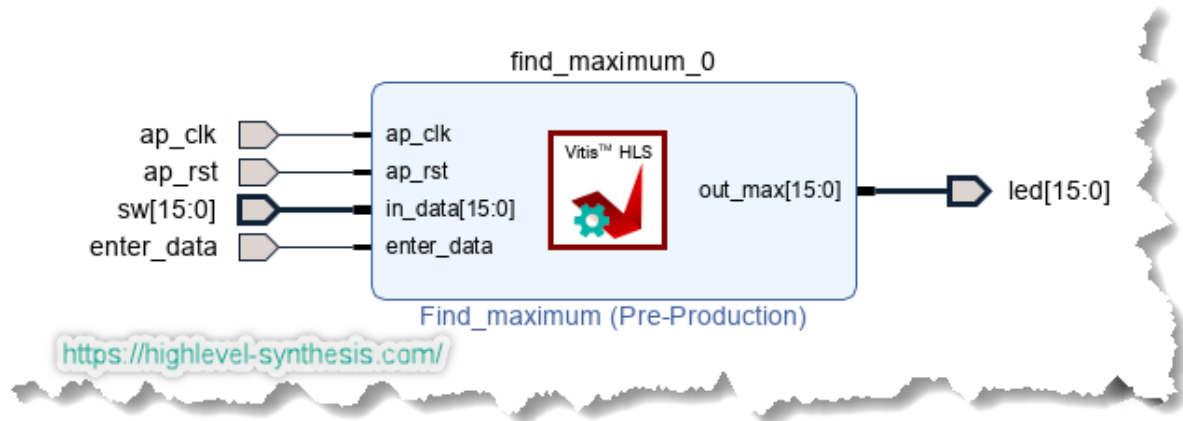
**Note:** All the design inputs connected to push-buttons in these exercises should use debouncer IP. This IP will be described in HLS later in this course. However, the first two exercises are carefully designed that give correct results even without a switch debouncer circuit.

1- This figure shows the design in Vivado



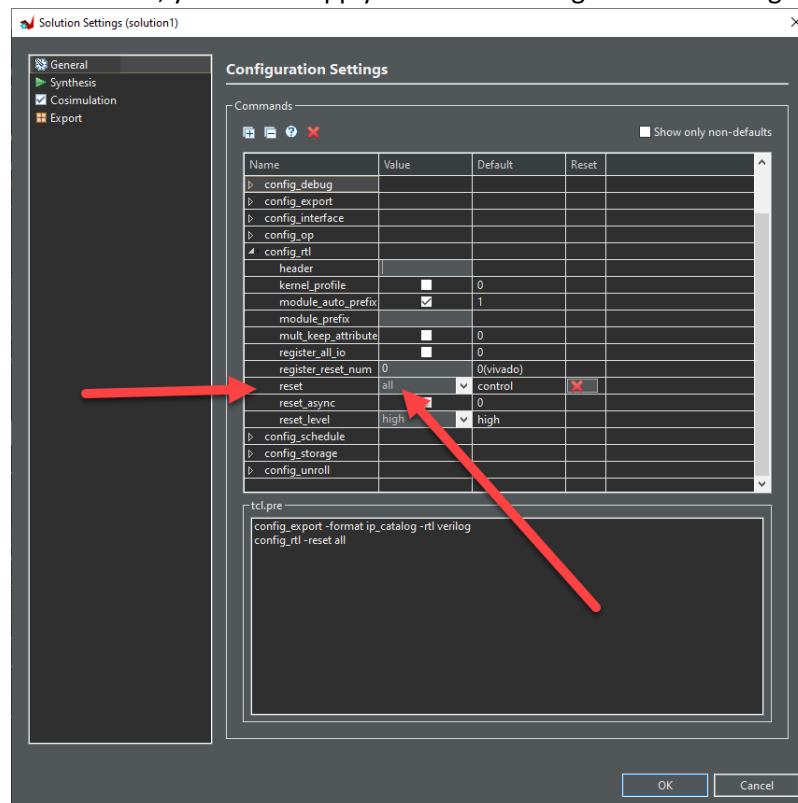
The codes are attached to the lecture.

2- This figure shows the design in Vivado



The codes are attached to the lecture.

Note that in the Vitis-HLS, you should apply the rest to all register in the design.



- 3- The source code is attached to this lecture.

Note that pressing a mechanical switch inserts several pulses to a digital circuit. In order to convert this bouncy signal into a clear pulse, we need a debouncer circuit. This is the reason that our design in Vivado does not generate the expected results.