Homework : Key Bouncing and Debouncing It

Objective :

Learn how to eliminate key bouncing in VHDL designs.

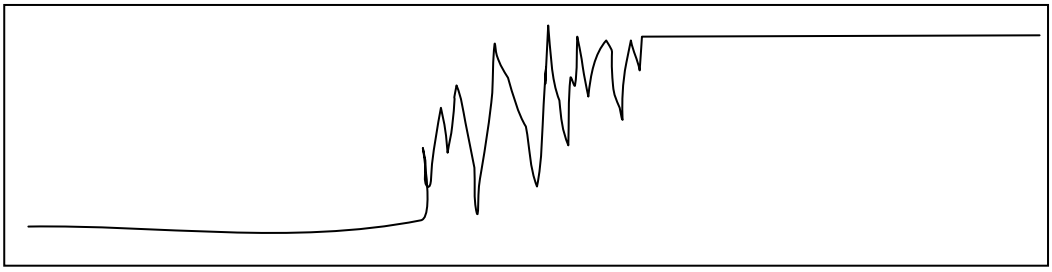
Assignment :

When mechanical switches are turned on or off and buttons are pushed and released they make and break the circuit several times before the connection or disconnection is settled. That is, their electrical contacts mechanically bounce. For some circuits this behavior is not important. For circuits that accept fast input changes, however, this poses a great problem. Therefore the problem should be handled (debounced) properly so that there is a clear on and/or off signal at the input of a fast circuit.

Your assignment is to;

1. Write a report that explains this behavior and how contact debouncing is achieved electronically in practice. Explain each method that might be used. Make your report to be 3 pages maximum with graphics/pictures. Research the subject on Internet.
2. Create your VHDL design for contact debouncing, explain it. You may include simulations.
3. Test your design during lab hours. Append your results, schematics and improvements to your report. You may write another report for results instead of appending it to the pre-written report.

Keep in mind that a key debouncer should debounce both rising and falling edges.



In order to test your debouncer, you may use a counter that receives its clock input from a push button and displays the count on LEDs.

Note : When you are testing your design at home, use ISIM simulator.