

Digital Logic Design

4190.201.001

2010 Spring Semester

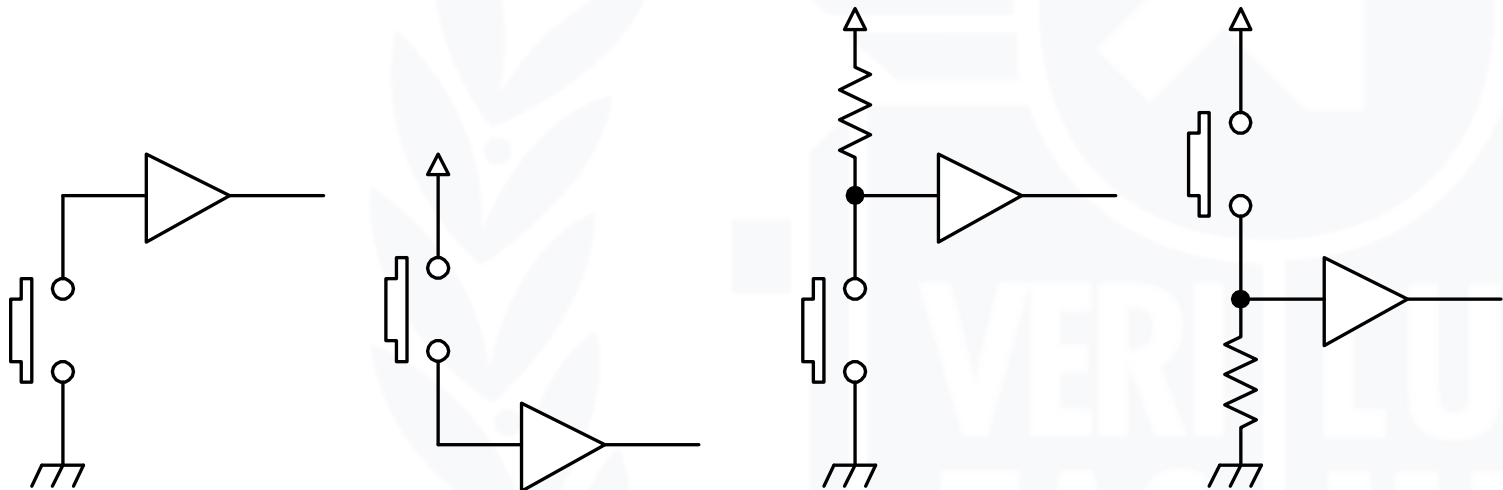
Chatterless Switch

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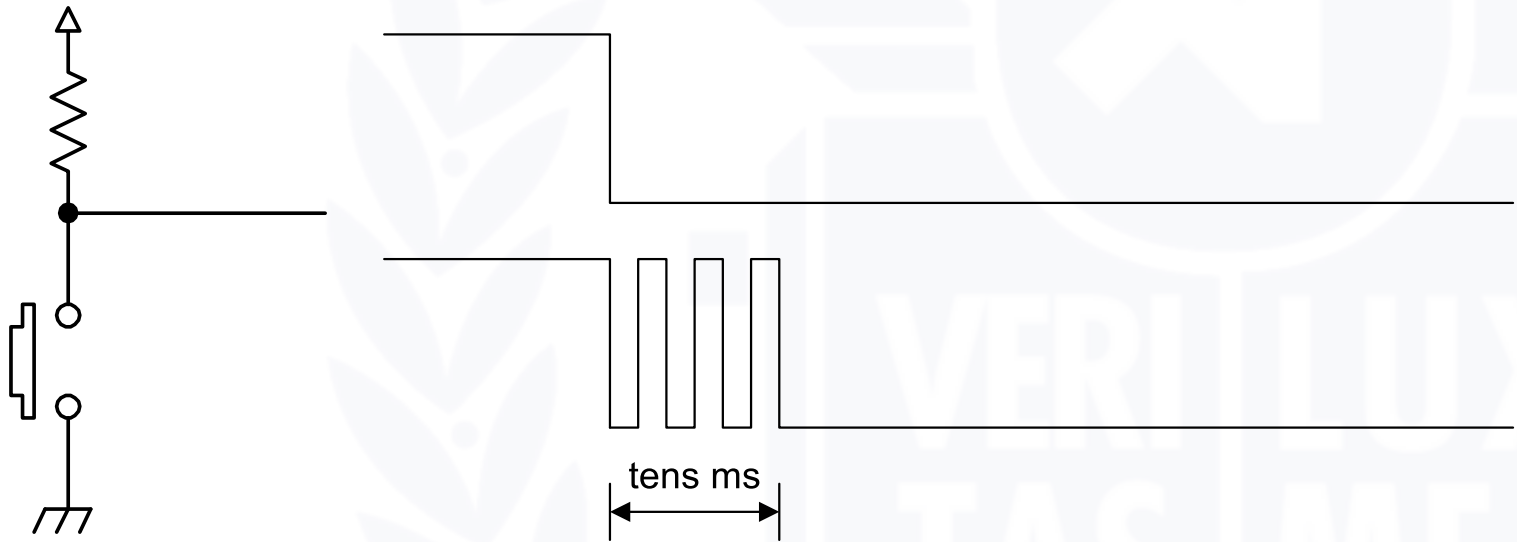
Switch interface

- Push button switch interface
 - Find correct one (s)



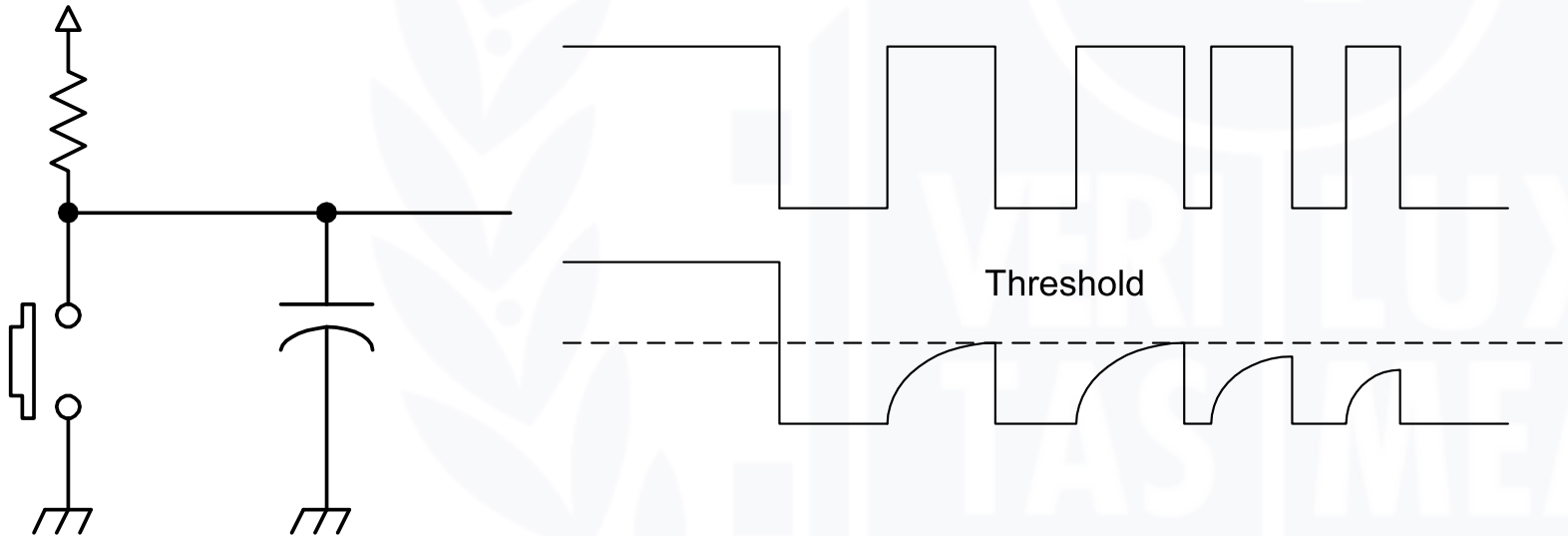
Chattering

- Mechanical switch



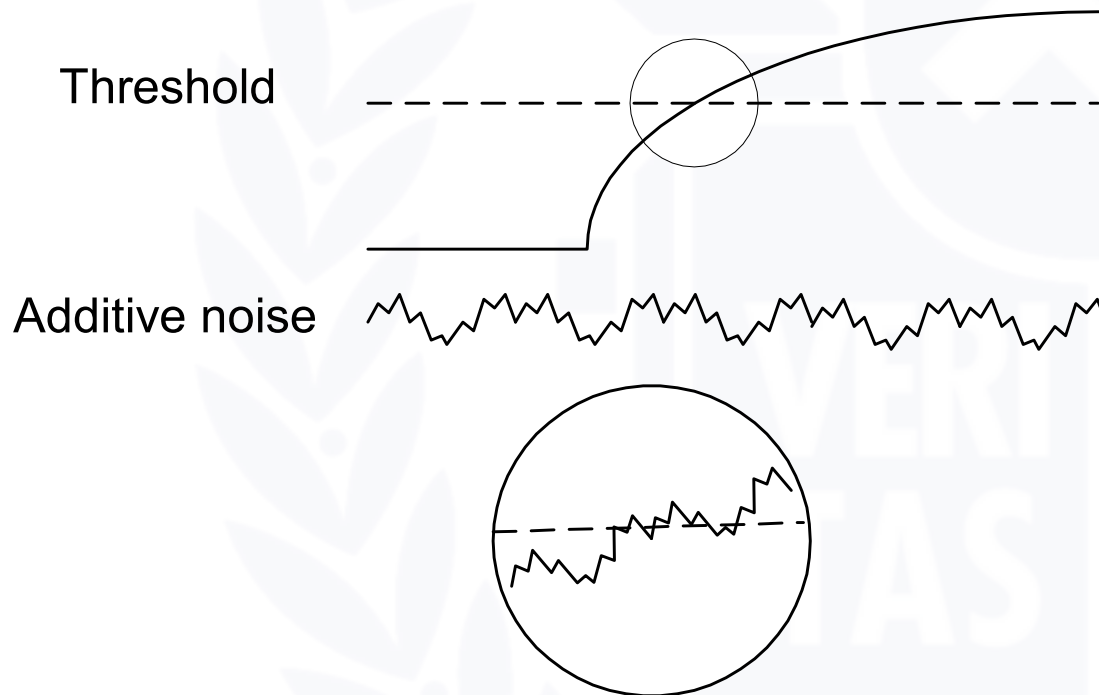
RC filtering

- 10% ~ 90% rise time is $2.2RC$.
- Large RC? Or small RC?



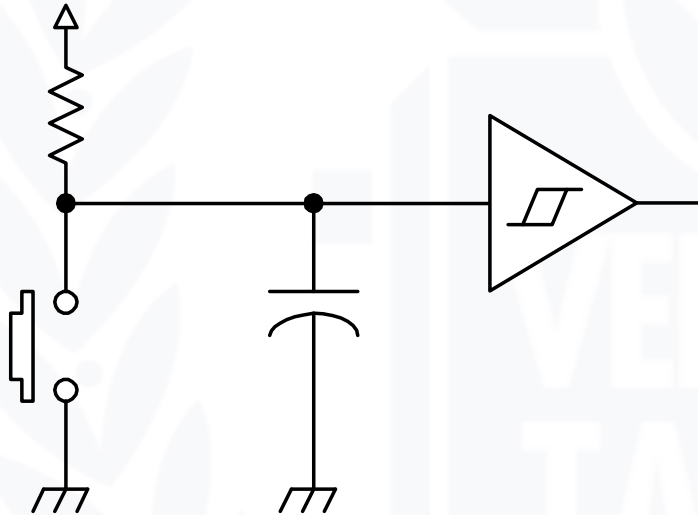
Real world

- Noise!



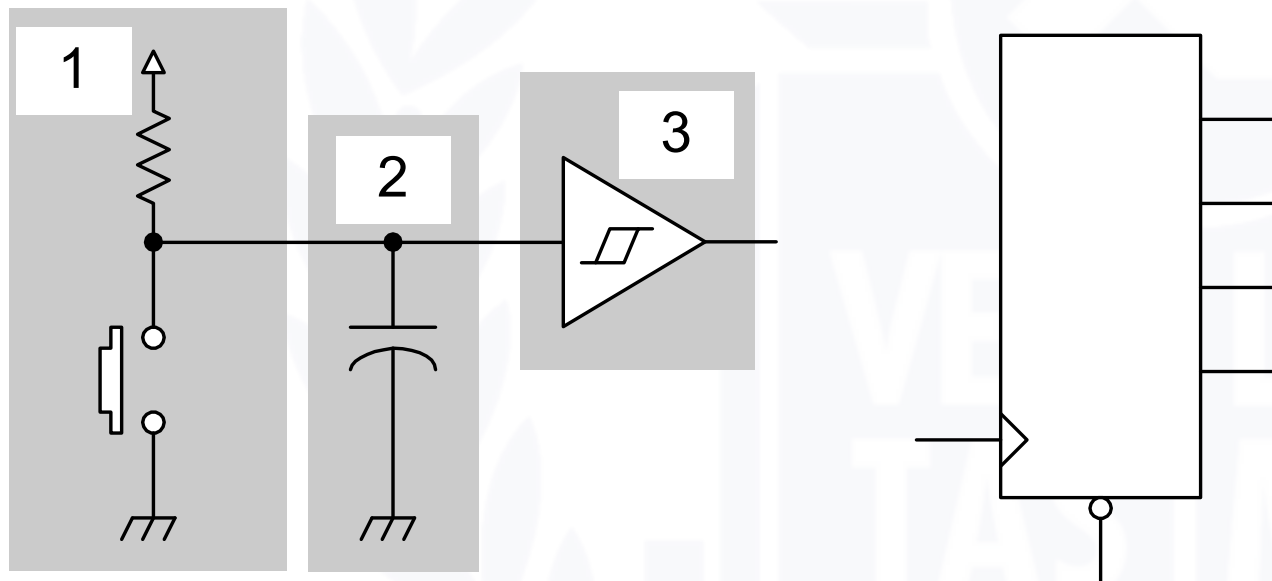
Solution

- Schmitt trigger (hysteresis)



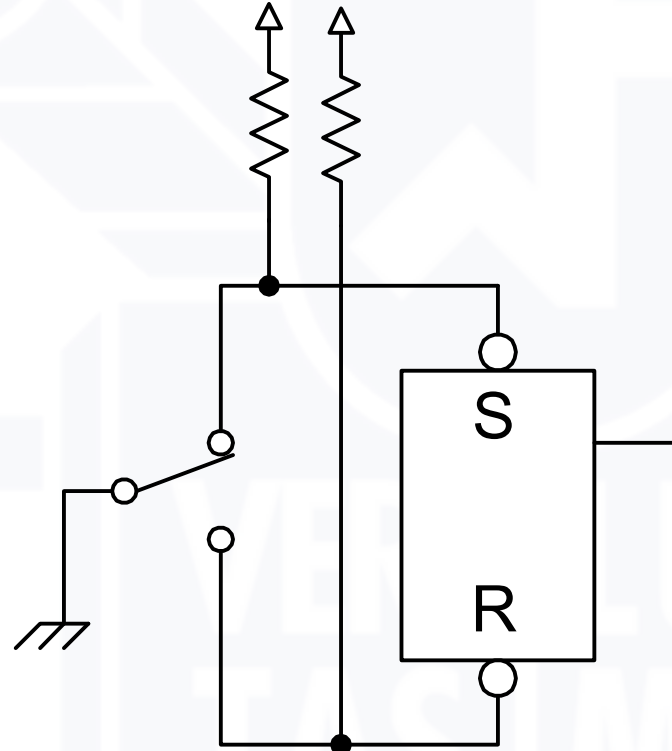
Chattering experiment

- Count chattering



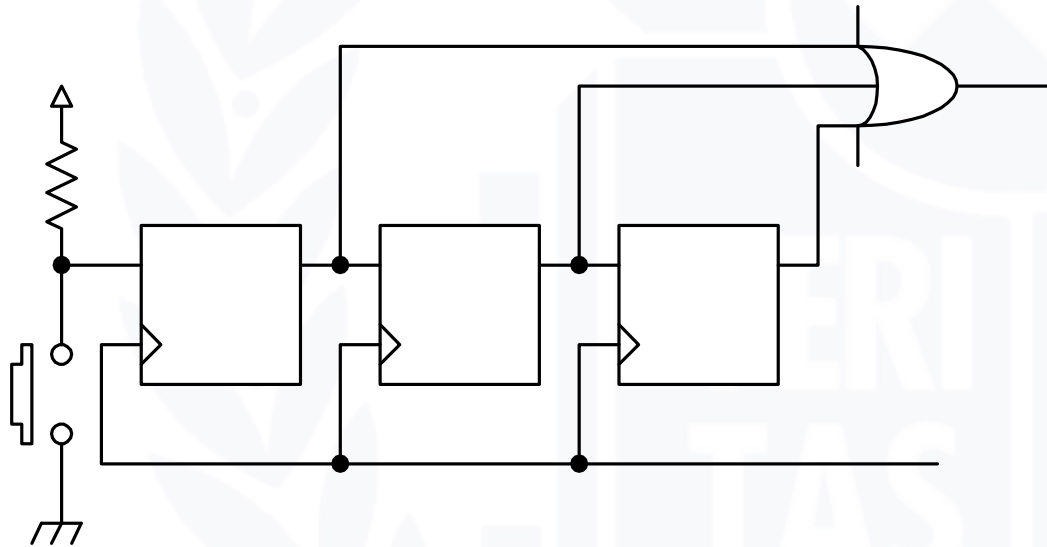
Other solutions

- Use RS flip flops
 - Make-before-break?
 - Break-before-make?



Digital filter

- Flip-flop abundant environments



Software solution

- Algorithm
 - Read switch
 - If pressed then
 - wait tens ms
 - read again

