ENGINE

Erasmus+

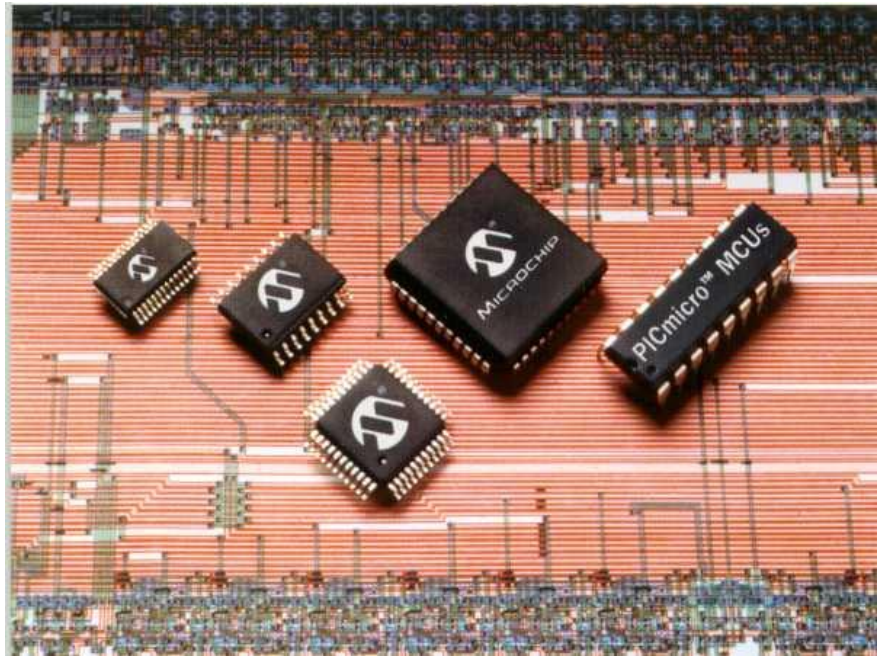
TEACHING ONLINE ELECTRONICS, MICROCONTROLLERS AND PROGRAMMING IN HIGHER EDUCATION

Module_2-7. Push Button

PIC18F4550 with Proteus Simulation

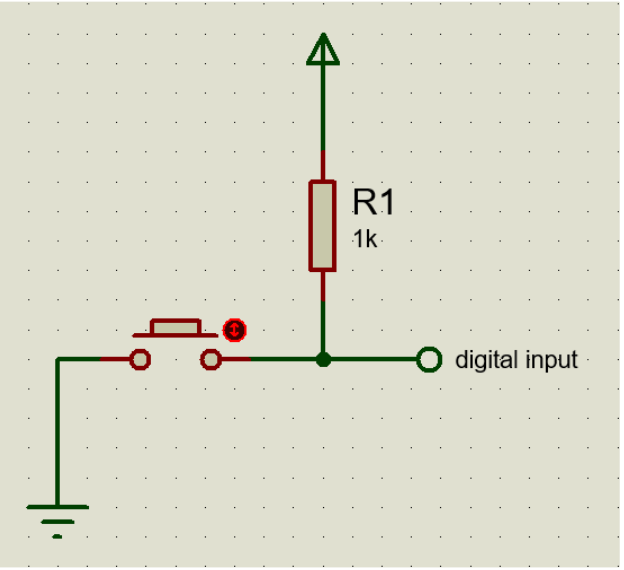
Contents

- Connections
- Example



Module_2-7. Push button Connections

The push-button can be considered as a normally open switch, which closes for as long as we have pressed it. Logical “0” and “1” can be created from the push-button with the appropriate wiring.



Pull-up resistor

The digital input reads “1” as long as the push-button is not pressed.

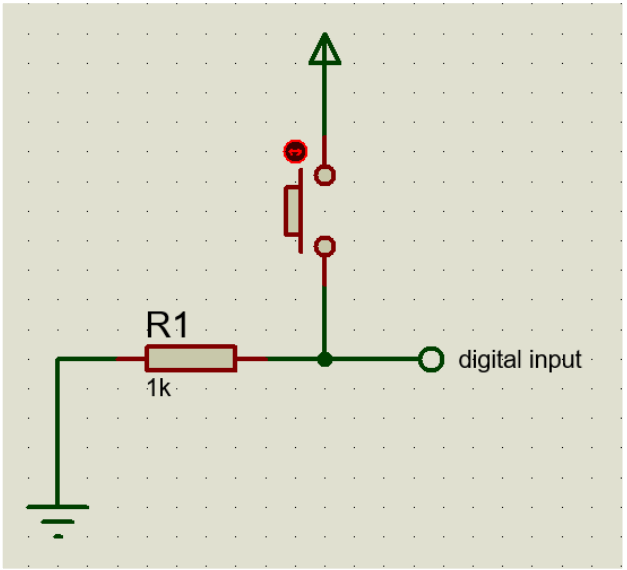
As long as the switch is pressed the input will read “0”.

Module_2-7. Push button Connections

The push-button can be considered as a normally open switch, which closes for as long as we have pressed it. Logical “0” and “1” can be created from the push-button with the appropriate wiring.

The digital input reads “0” as long as the push-button is not pressed.

As long as the switch is pressed the input will read “1”.



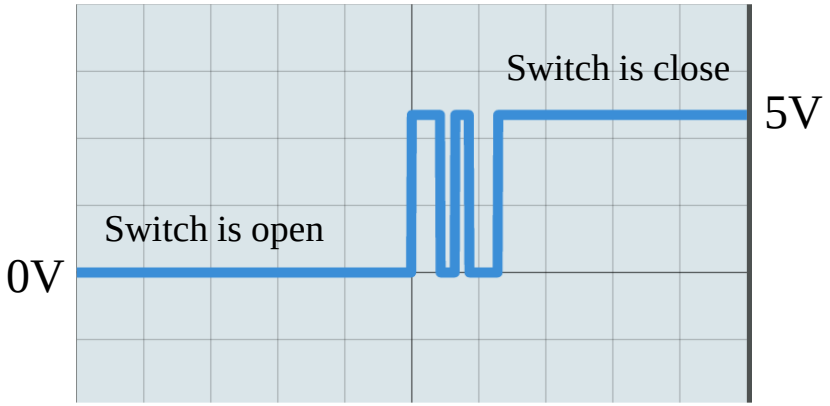
Pull-down resistor

Module_2-7. Push button Connections

Mechanical parts, such as switches and push-buttons, cause the digital input signal to bounce.

These bounces result in the input going back and forth between logical “0” and “1” for a short period of time.

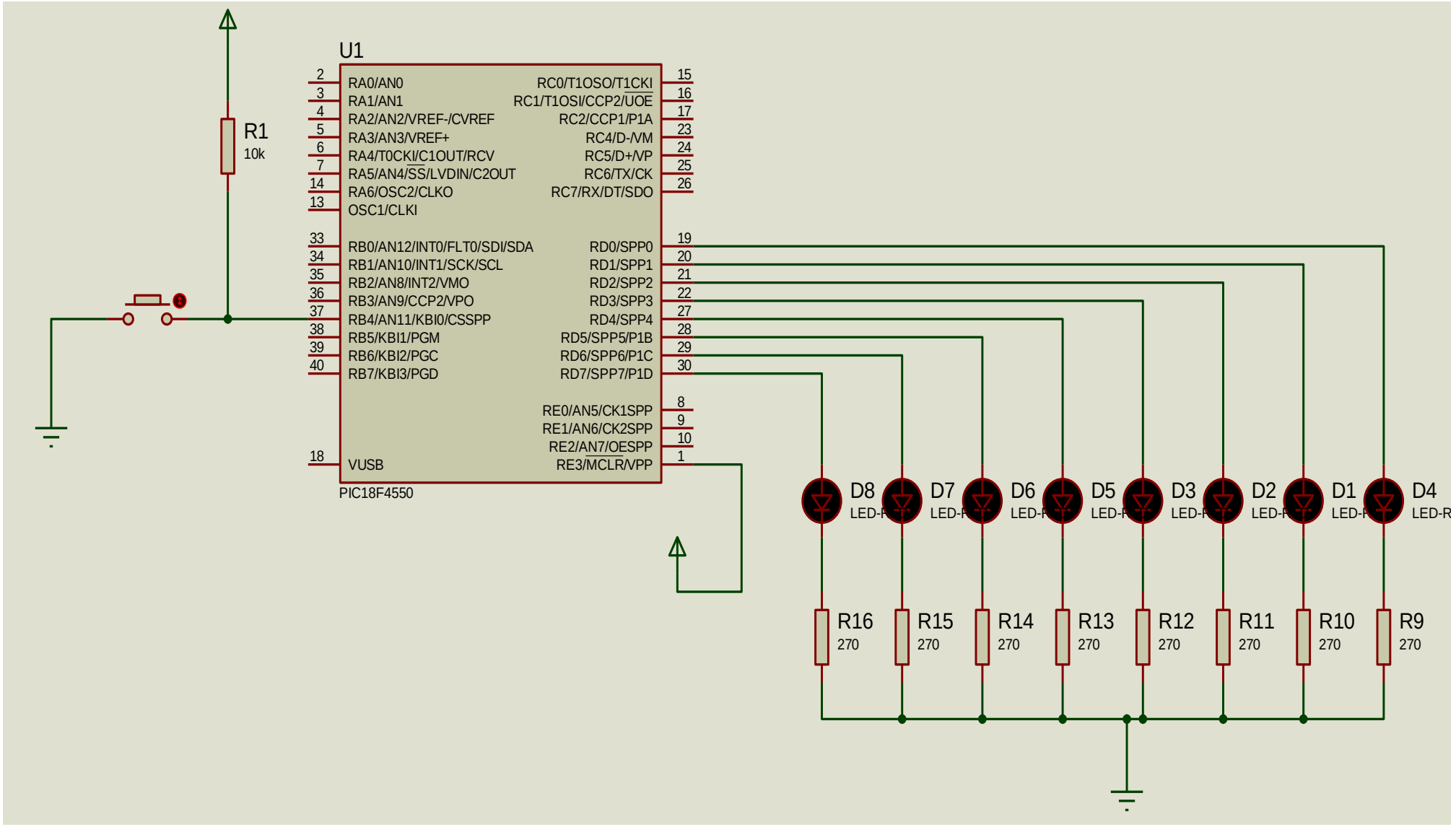
To avoid bounces, an easy and quick solution is to freeze the program for a few milliseconds (approximately 25ms).



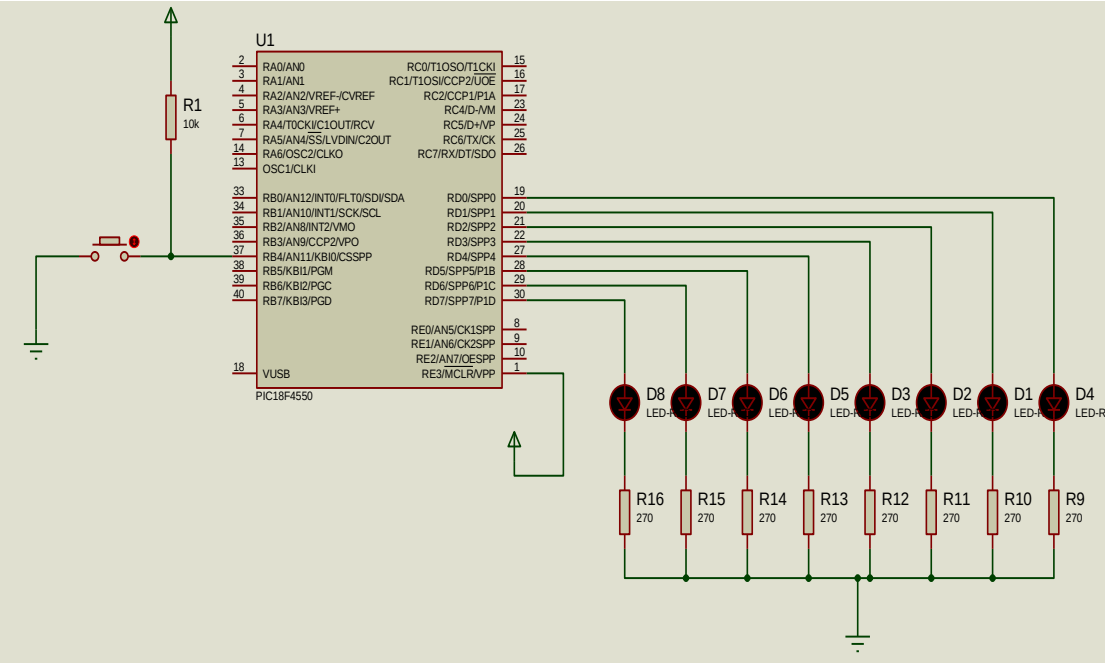
Bounces

1. https://www.allaboutcircuits.com/technical-articles/switch-bounce-how-to-deal-with-it/

Module_2-7. Push button Example



Module_2-7. Push button Example



The purpose is that every time we press and release a button which is connected to pin RB4 the value of PORTD is increased by 1. The result of the increase can be seen on 8 LEDs which are connected to PORTD

Module_2-7. Push button Example

```
#include<main.h>            // This file contains the initial settings
                            // It must be in the same folder with the project
#byte PORTB=0xF81           // F81 Is the position or PORTB data register
                            // at the data memory of the microcontroller
                            // SFR Special Function Register
#byte PORTD=0xF83           // F83 Is the position or PORTB data register
                            // at the data memory of the microcontroller
                            //SFR Special Function Register
// *********   Main program   ************************
void main()
{
  set_tris_d(0x00); //PORTD is set as output port
  set_tris_b(0xFF);  //PORTB is set as input port
  PORTD=0x00;
  while(TRUE) {
     while(input(PIN_B4) == 1) {}
          // Wait until the button is pressed
          // In the wait state, no command is executed
          // When the button is pressed the loop is exited and the next command is executed
    delay_ms(50);
    while(input(PIN_B4) == 0) {}
          // Wait until the button is released
          // In the wait state, no command is executed
          // When the button is pressed the loop is exited and the next command is executed
   delay_ms(50);
   PORTD=PORTD+1;
    }
}
```

ENGINE Partnership

- Warsaw University of Technology (PL) - *coordinator*
- IHU - International Hellenic University (GR)
- EDUMOTIVA - European Lab for Educational Technology (GR)
- University of Padova (IT)
- University of Applied Sciences in Tarnow (PL)

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