Lab 3: Pavel Vaněk

Link to my `Digital-electronics-2` GitHub repository:

https://github.com/Bobik77/Digital-electronics-2

Data types in C

1. Complete table.

Data type	Number of bits	Range	Description
`uint8_t`	8	0, 1, ..., 255	Unsigned 8-bit integer
`int8_t`	8	-128,127, ...,127	Signed 8-bit integer
`uint16_t`	16	0,1, ..., 65535	Unsigned 16-b integer
`int16_t`	16	-32768, ..., 32766,32767	Signed 16-b integer
`float`	32	-3.4e+38, ..., 3.4e+38	Single-precision floating-point
`void`	none	-	No value expression

GPIO library

1. In your words, describe the difference between the declaration and the definition of the function in C.
    - Function declaration - Deklaruje compileru název, vstupní parametry funkcea a jak funkci volat. Soubor s deklaracemi se nazývá header a má příponu "*.h"
    - Function definition - definuje samotné tělo funkce - tj. jednotlivé příkazy, které se vykonají při zavolání funkce. Soubory s definicí funkce mají přípou "*.c"
2. Part of the C code listing with syntax highlighting, which toggles LEDs only if push button is pressed. Otherwise, the value of the LEDs does not change. Use function from your GPIO library. Let the push button is connected to port D:

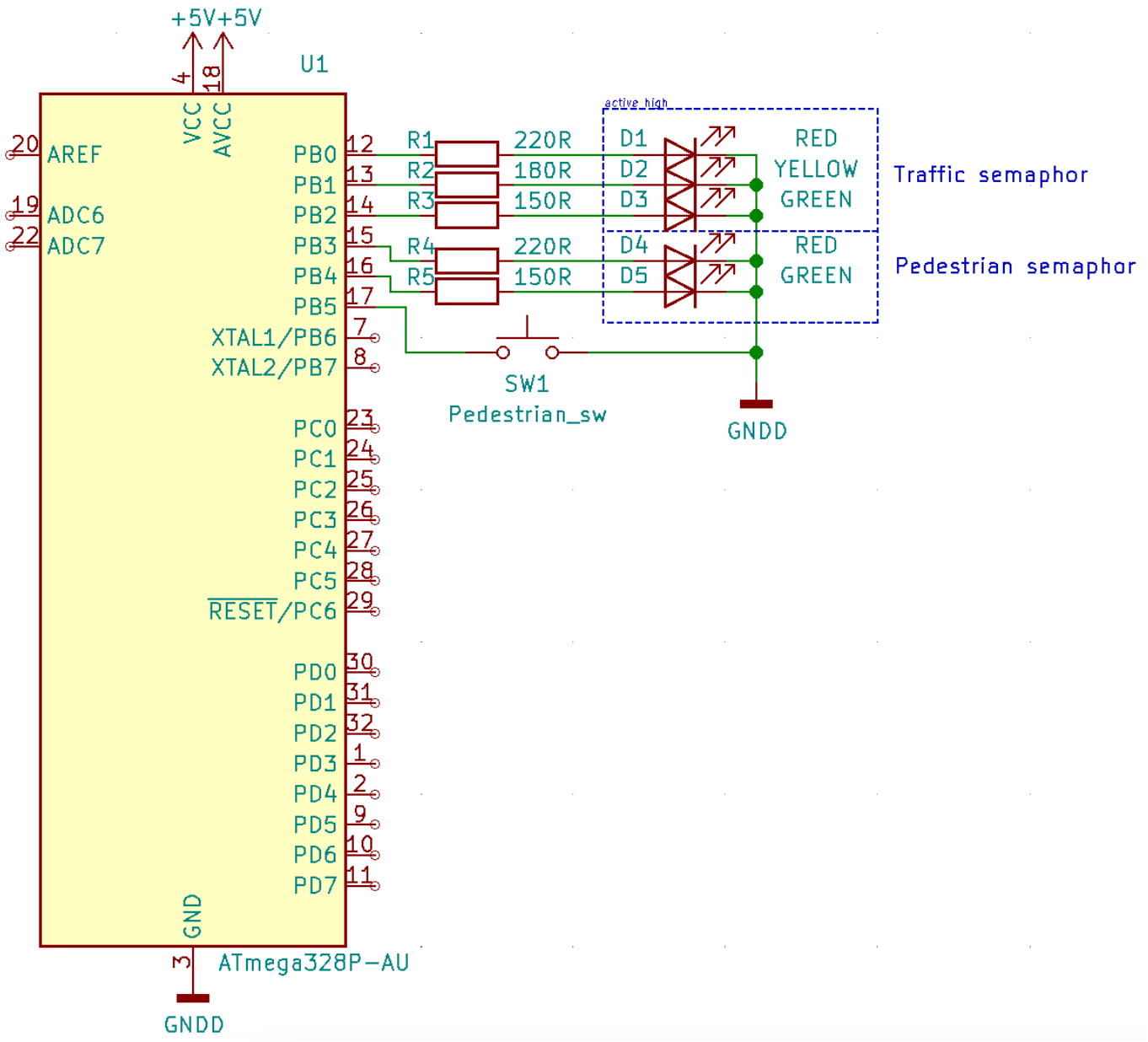
```
// Configure Push button at port D and enable internal pull-up resistor
GPIO_config_input_pullup(&PORTD, PUSH_BTN);

// Infinite loop
while (1)
{
    if (!GPIO_read(&PORTD, PUSH_BTN)) //if pressed
    {
        GPIO_toggle(&PORTB, LED_GREEN);
        GPIO_toggle(&PORTB, LED_EXTERNAL); //toggle led state

        // Pause several milliseconds
        _delay_ms(BLINK_DELAY);
    }
}
```

Traffic light

1. Scheme of traffic light application with one red/yellow/green light for cars and one red/green light for pedestrians. Connect AVR device, LEDs, resistors, one push button (for pedestrians), and supply voltage. The image can be drawn on a computer or by hand. Always name all components and their values!


+5V+5V
U1
4
18
VCC
AVCC
20
AREF
19
ADC6
22
ADC7
PB0
PB1
PB2
PB3
PB4
PB5
XTAL1/PB6
XTAL2/PB7
PC0
PC1
PC2
PC3
PC4
PC5
RESET/PC6
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
12
13
14
15
16
17
7
8
23
24
25
26
27
28
29
30
31
32
1
2
9
10
11
GND
3
ATmega328P-AU
GNDD
R1
R2
R3
R4
R5
220R
180R
150R
220R
150R
active high
D1
D2
D3
D4
D5
RED
YELLOW
GREEN
RED
GREEN
Traffic semaphor
Pedestrian semaphor
SW1
Pedestrian_sw
GNDD