Lab 3: Pavlo Shelemba

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

https://github.com/xshele01/Digital-electronics-2

Data types in C

Data type	Number of bits	Range	Description
uint8_t	8	0 to 255	Unsigned 8-bit integer
int8_t	8	-128 to 127	Signed 8-bit integer
uint16_t	16	0 to 65,535	Unsigned 16-bit integer
int16_t	16	-32,768 to 32,767	Signed 16-bit integer
float	32	-3.4e+38 to 3.4e+38	Single-precision floating-point
void	-	-	No type

GPIO library

1. Difference between function declaration and definition in C:
   - **Function declaration** tells the compiler about the existence of a function.
   - **Function definition** actually implements a function.
2. Part of the C code, which uses my GPIO library to toggle LEDs when a push button is pressed. Otherwise, the values of the LEDs do not change. The button is connected to port D:
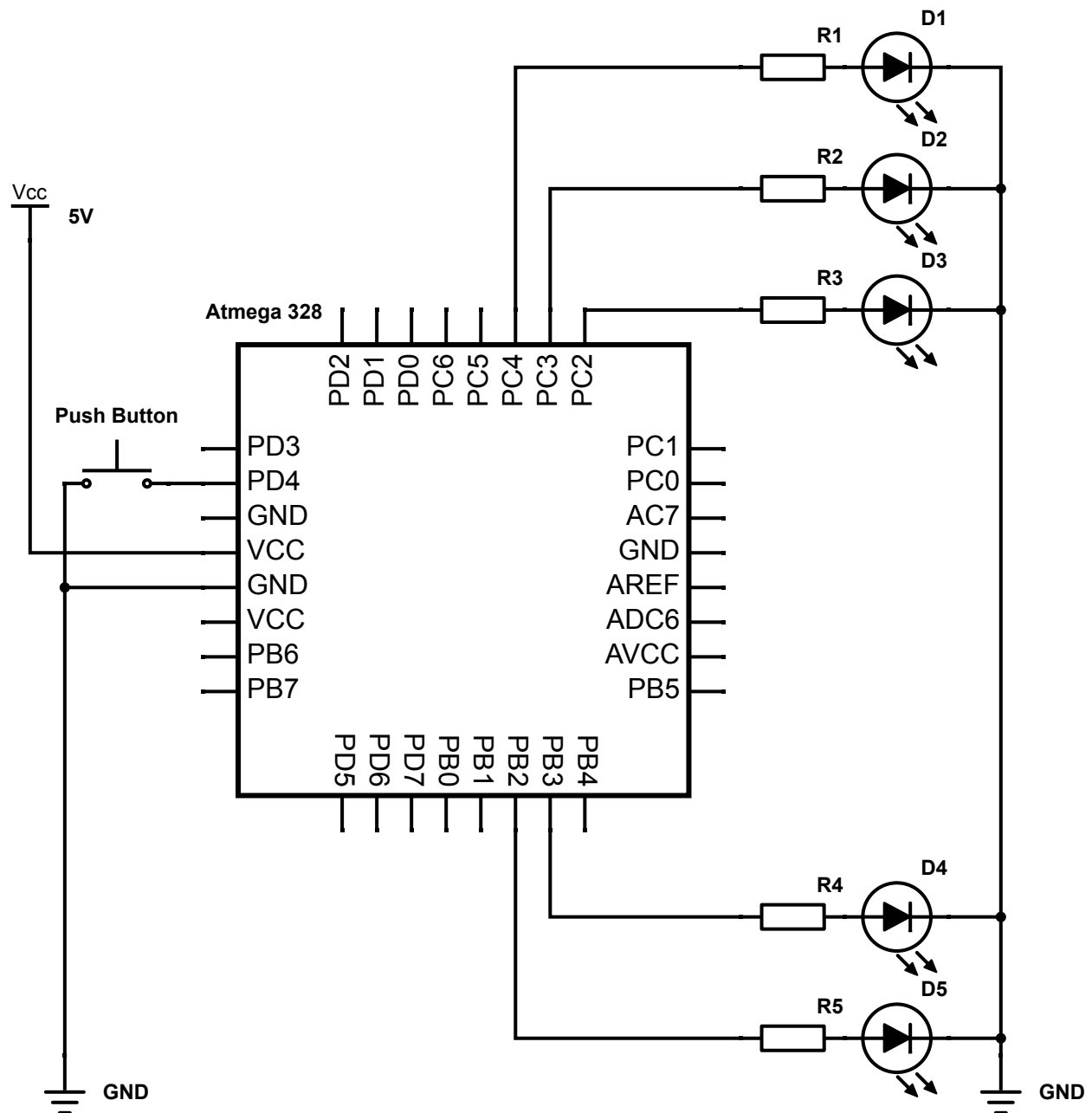
```
    // Configure Push button at port D and enable internal pull-up resistor
    GPIO_config_input_pullup(&DDRD, PUSH_BTN);

    // Infinite loop
    while (1)
    {
        if (!GPIO_read(&PIND, PUSH_BTN))
        {
            GPIO_toggle(&PORTB, LED_GREEN);
            GPIO_toggle(&PORTC, LED_BREAD);

            while (!GPIO_read(&PIND, PUSH_BTN))
                continue;
        }
    }
```

Traffic light

1. Scheme of traffic light application (connection of AVR device, LEDs, resistors, push button and supply voltage):

Component	Description
D1, D4	Red LEDs
D2	Yellow LED
D3, D4	Green LEDs
R1-R5	Current limiting resistors