## Lab 1: Pavlo Shelemba

My Digital-electronics-2 GitHub repository:

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

## Blink example

1. C programming language contains following binary operators:

Opetaor	Symbol	Form	Operation	
bitwise OR	I	x   y	each bit in x OR each bit in y	
bitwise AND	&	x & y	each bit in x AND each bit in y	
bitwise XOR	^	x ^ y	each bit in x XOR each bit in y	
bitwise NOT	~	~x	all bits in x flipped	
left shift	<<	x << y	all bits in x shifted left y bits	
right shift	>>	x >> y	all bits in x shifted right y bits	

2. Truth table for operators  $| , \&, ^, \sim :$ 

b	а	b or a	b and a	b xor a	not b
0	0	0	0	0	1
0	1	1	0	1	1
1	0	1	0	1	0
1	1	1	1	0	0

## Morse code

1. Listing of the C code, which repeats one "dot" and one "dash" (letter A) on a LED:

```
int main(void)
    // Set pin as output in Data Direction Register
    // DDRB = DDRB or 0010 0000
    DDRB = DDRB | (1<<LED_GREEN);</pre>
    // Set pin LOW in Data Register (LED off)
    // PORTB = PORTB and 1101 1111
    PORTB = PORTB & ~(1<<LED_GREEN);</pre>
    // Infinite loop
    while (1)
    {
        // Pause several milliseconds
        _delay_ms(SHORT_DELAY);
        // Dot
        PORTB = PORTB | (1<<LED_GREEN);
        _{delay_ms(SHORT\_DELAY * 2)};
        PORTB = PORTB & ~(1<<LED_GREEN);
        _delay_ms(SHORT_DELAY);
        // Dash
        PORTB = PORTB | (1<<LED_GREEN);</pre>
        _{delay_ms(SHORT\_DELAY * 4)};
        PORTB = PORTB & ~(1<<LED_GREEN);
    }
}
```

2. Scheme of Morse code application (connection of AVR device, LED, resistor, and supply voltage):

