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	`|`	`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 `|`, `&`, `^`, `~`:

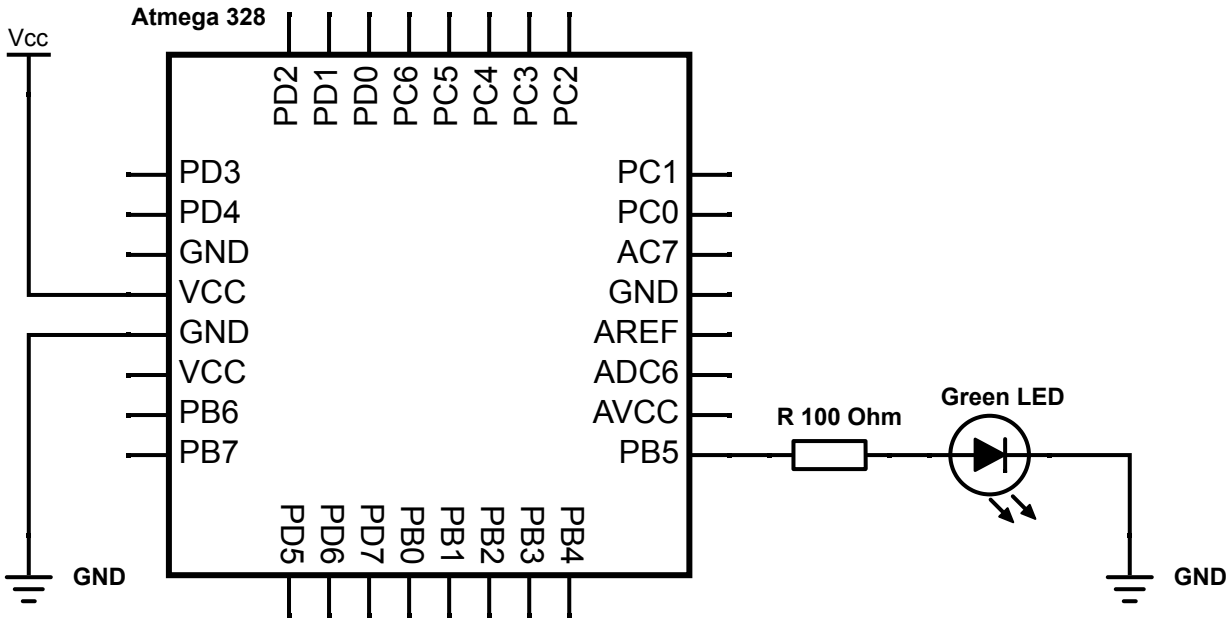
b	a	b or a	b and a	b xor a	not b
0	0	0	0	0	1
0	1	1	0	1	1
1	0	1	0	1	0
1	1	1	1	0	0

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);

    // Set pin LOW in Data Register (LED off)
    // PORTB = PORTB and 1101 1111
    PORTB = PORTB & ~(1<<LED_GREEN);

    // 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);

        _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):


Atmega 328
Vcc
PD2
PD1
PD0
PC6
PC5
PC4
PC3
PC2
PD3
PD4
GND
VCC
GND
VCC
PB6
PB7
PC1
PC0
AC7
GND
AREF
ADC6
AVCC
PB5
PD5
PD6
PD7
PB0
PB1
PB2
PB3
PB4
R 100 Ohm
Green LED
GND
GND