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

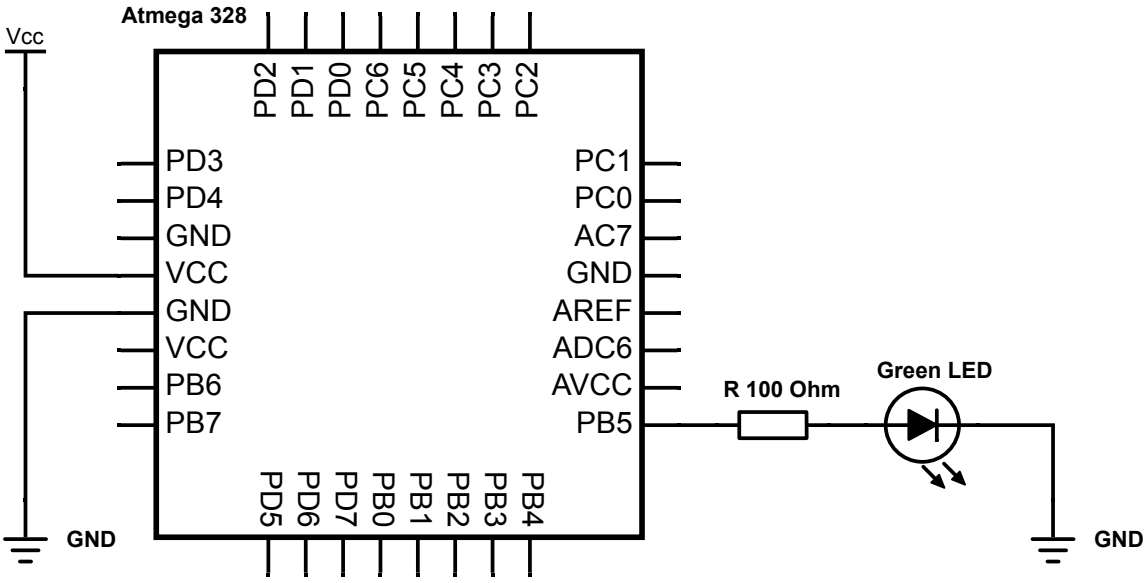
b	a	b or a	b and a	b xor a	not b
0	0	0	0	0	1
0	1	1	0	1	1
1	0	1	0	1	0
1	1	1	1	0	0

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
R 100 Ohm
Green LED
PD5
PD6
PD7
PB0
PB1
PB2
PB3
PB4
GND
GND