

Lab 1: EVA MOMENCEAU

Link to your Digital-electronics-2 GitHub repository:

<https://github.com/Eva-Momenceau/Digital-Electronics-2>

Blink example

1. What is the meaning of the following binary operators in C?

- `|` : logical OR
- `&` : logical AND
- `^` : logical EX-OR
- `~` : one's complement
- `<<` : left shift
- `>>` : right shift

2. Complete truth table with 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 C code with syntax highlighting which repeats one "dot" and one "comma" (BTW, in Morse code it is 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*4);

        // WRITE YOUR CODE HERE
    }
}
```

```

PORTB = PORTB ^ (1<<LED_GREEN); // Turn the Led on for 1 sec (dot)
_delay_ms(SHORT_DELAY*4);

PORTB = PORTB & ~(1<<LED_GREEN); //Turn the Led off for 1 sec
_delay_ms(SHORT_DELAY*4);

PORTB = PORTB ^ (1<<LED_GREEN); // Turn the Led on for 3 sec (coma)
_delay_ms(SHORT_DELAY*4*3);

PORTB = PORTB & ~(1<<LED_GREEN); // Turn the Led off

}

// Will never reach this
return 0;
}

```

2. Scheme of Morse code application, i.e. connection of AVR device, LED, resistor, and supply voltage. The image can be drawn on a computer or by hand. Always name all components and their values!

