Lab 1: Git version-control system, AVR tools

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1. The link to my repository is:

https://github.com/elenaab16/Digital-Electronics2

2. Blink example.
   - | : represents the logic OR.
   - & : represents the logic AND.
   - ^ : represents the logic XOR.
   - ~ : represents one's complement.
   - << : represents left shifting.

3. Morse Code application.

```
/*
 * MorseCode.c
 *
 * Created: 29/09/2020 13:24:45
 * Author : Elena Arjona Bustos
 */


/* Defines ----------------------------------------------------------*/
#define LED_GREEN   PB5     // AVR pin where green LED is connected
#define SHORT_DELAY 500      // Delay in milliseconds
#define LONG_DELAY 1000      // Delay in milliseconds


#ifndef F_CPU
#define F_CPU 16000000      // CPU frequency in Hz required for delay
#endif
```

```
/* Includes ------------------------------------------------------------*/
#include <util/delay.h>     // Functions for busy-wait delay loops
#include <avr/io.h>         // AVR device-specific IO definitions


#include <avr/io.h>

/* Functions -----------------------------------------------------------*/

/**
* Long wait function. Turns on the LED for the long period of time and then,
* it turn it off.
*/
void long_wait(void);

/**
* Short wait function. Turns on the LED for the short period of time and then,
* it turn it off.
*/
void short_wait(void);


/**
 * Main function where the program execution begins. Toggle one LED
 * and use function from the delay library.
 */
```

```
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);

   while (1)
   {

         // Letter D -> _ . .

         long_wait();
         short_wait();
         short_wait();

         // Letter E -> - .

         long_wait();
         short_wait();
```

```
            // Number 2 -> . . _ _ _

            short_wait();
            short_wait();
            long_wait();
            long_wait();
            long_wait();

    }
}

void long_wait(void){

            // Set pin HIGH in Data Register (LED on)
            // PORTB = PORTB and 1101 1111
            PORTB = PORTB  | (1<<LED_GREEN);

            // Pause several milliseconds
            _delay_ms(LONG_DELAY);

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

            // Pause several milliseconds
            _delay_ms(SHORT_DELAY);
```

```
}

void short_wait(void){

        // Set pin HIGH in Data Register (LED on)
        // PORTB = PORTB and 1101 1111
        PORTB = PORTB  | (1<<LED_GREEN);

        // Pause several milliseconds
        _delay_ms(SHORT_DELAY);

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

        // Pause several milliseconds
        _delay_ms(SHORT_DELAY);

}
```