Lab 3: EVA MOMENCEAU

Link to your Digital-electronics-2 GitHub repository:

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

Data types in C

1. Complete table.

Data type	Number of bits	Range	Description
uint8_t	8	0, 1, …, 255	Unsigned 8-bit integer
int8_t	8	-128 to 127	signed 8-bit integer
uint16_t	16	0 to 65535	unsigned 16-bit integer
int16_t	16	-32768 to 32767	signed 16-bit integer
float	32	-3.4e+38, …, 3.4e+38	Single-precision floating-point
void	0	none	none

GPIO library

1. In your words, describe the difference between the declaration and the definition of the function in C.

   - Function declaration : Used to tell to the compiler that the function exists (name/argument/type of return)
   - Function definition : Tell to the compiler what to do when the function is called

2. Part of the C code listing with syntax highlighting, which toggles LEDs only if push button is pressed. Otherwise, the value of the LEDs does not change. Use function from your GPIO library. Let the push button is connected to port D:

```c
// Configure Push button at port D and enable internal pull-up resistor
// WRITE YOUR CODE HERE


// Infinite loop
// Configure the green LED as output
GPIO_config_output(&DDRB, LED_GREEN);
GPIO_write_low(&PORTB, LED_GREEN);

GPIO_config_input_pullup(&DDRD, BTN); // Configure the push button at the port D and enable internal pull-up resistor

// Infinite loop
while (1)
{
    if(!(GPIO_read(&PIND, BTN) == 1)) // If the button is pushed
    {
        GPIO_toggle(&PORTB, LED_GREEN); // Change the state of the LED
        _delay_ms(1000); // Let 1sec befor shecking the state of the push button again
    }
}
```

Traffic light

1. Scheme of traffic light application with one red/yellow/green light for cars and one red/green light for pedestrians. Connect AVR device, LEDs, resistors, one push button (for pedestrians), and supply voltage. The image can be drawn on a computer or by hand. Always name all components and their values!

atmega328-1

Push button

Ground

C6
D0
D1
D2
D3
D4
Vcc
Gnd
B6
B7
D5
D6
D7
B0

C5
C4
C3
C2
C1
C0
Gnd
Ar
A+
B5
B4
B3
B2
B1

100

100