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Lab 1:

Introduction to the AVR128DB48 Curiosity Nano Microcontroller Board and Microchip Studio 7 Integrated Development Environment

Questions:
1. No the program produces a different result. It still turns on and off with the press of the button, but there is a delay in the LED turning off.
2. No, connecting the oscilloscope makes the LED stay on the whole time.
3. The pullup system creates an active low switch. When there is no resistor, closing the switch creates a short circuit. Thus it takes a few seconds for the voltage at the switch end of the LED to create a voltage difference big enough to light it.
4. abs(0.9982 - 1)/9982 = 1.8e-7 = 0.00002% error.
5. From the results we can conclude that the clock is quite accurate, because this frequency produces a period of 1.0018 s, and adding the two 500 ms delays and the two instructions it comes to a 1.002 s period.

VCC

SW1

SW PUSHBUTTON

PA 2 (internal pullup)

R1
1k

SW2

SW PUSHBUTTON

PA 5 (internal pullup)

120NQ045
D1

1

2

PB 5

0

```c
/*
 * PB1_and_PB2_control_LED.c
 *
 * Created: 2/12/2021 3:22:33 PM
 * Author : Judah Ben-Eliezer
 */

#include <avr/io.h>

int main(void)
{
    VPORTA_DIR = 0x00;
    VPORTB_DIR = 0x20;
    PORTA_PIN2CTRL = 0x08;
    PORTA_PIN5CTRL = 0x08;

    while (1)
    {
        VPORTB_OUT = ~VPORTA_IN | (VPORTA_IN << 3);
    }
}
```