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B31DG – Embedded Software

Assignment 1 – Report

1. Pictures of the code + photo of the circuit

[photo of the circuit]

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// B31DG - EMBEDDED SOFTWARE

// =========================

// ASSIGNMENT 1

//

// Lucas Isaac

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// =========================

// definition of the pins

#define signal\_A\_pin 15

#define signal\_B\_pin 21

#define button\_1 22

#define button\_2 23

// definition of the parameters

const int a = 9\*100; // width of 1st pulse

const int b = 8\*100; // width of space between pulses

const int c = 1+4; // number of pulses in a block

const int d = 1\*500; // space between pulse blocks

int b\_time = b; // variable to change the time of b (mode 4)

int d\_time = d; // variable to change the time of d (mode 4)

void setup() {

// signal A and B are outputs

pinMode(signal\_A\_pin, OUTPUT);

pinMode(signal\_B\_pin, OUTPUT);

// push buttons are defined on inputs

pinMode(button\_1,INPUT);

pinMode(button\_2,INPUT);

}

void loop() {

if (digitalRead(button\_2) == HIGH){ // case of button 2 is pushed, activate the mode

// mode 4 : the time b and d are divided by 2

b\_time = b/2;

d\_time = d/2;

}

else{ // if not, keep the normal mode with normal times

d\_time = d;

b\_time = b;

}

if(digitalRead(button\_1) == LOW){ // while the button 1 is not push, do the following part

digitalWrite(signal\_B\_pin, HIGH); //we first use the sig B for 50 microseconds

delayMicroseconds(50); //wait 50 microseconds

digitalWrite(signal\_B\_pin, LOW); //the signal B is low for the rest of the stream of pulses

for(int i=0; i<c; i++){ // repeat the following part c times

digitalWrite(signal\_A\_pin, HIGH); // switch on the LED A

delayMicroseconds(a + i\*50); // the delay of a increase of 50 microseconds each time we wait

digitalWrite(signal\_A\_pin, LOW); // switch off the LED A

delayMicroseconds(b\_time); // wait b microseconds with the signal A low

}

digitalWrite(signal\_A\_pin, LOW); // turn off the LED A

delayMicroseconds(d\_time); // wait d microseconds before use a new stream of pulses

}

else{ // if the button 1 is pushed, stop the pulses of stream

digitalWrite(signal\_A\_pin, LOW); // swith off the LED A

digitalWrite(signal\_B\_pin, LOW); // switch off the LED B

}

}

1. Explanation of the code + calculation of the parameters
2. Oscilloscope pictures and comment ?
3. Diagram

