

TECH 3233

Lab #3

Using the program from Lab #2 as a starting point and recalling that:

18.4.3. Port B Data Direction Register

When addressing I/O Registers as data space using LD and ST instructions, the provided offset must be used. When using the I/O specific commands IN and OUT, the offset is reduced by 0x20, resulting in an I/O address offset within 0x00 - 0x3F.

Name: DDRB
Offset: 0x24
Reset: 0x00
Property: When addressing as I/O Register: address offset is 0x04

	7	6	5	4	3	2	1	0
	DDR7	DDR6	DDR5	DDR4	DDR3	DDR2	DDR1	DDR0
Access	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Reset	0	0	0	0	0	0	0	0

Bits 7:0 – DDRBn: Port B Data Direction [n = 7:0]

18.4.2. Port B Data Register

















When addressing I/O Registers as data space using LD and ST instructions, the provided offset must be used. When using the I/O specific commands IN and OUT, the offset is reduced by 0x20, resulting in an I/O address offset within 0x00 - 0x3F.

Name: PORTB
Offset: 0x25
Reset: 0x00
Property: When addressing as I/O Register: address offset is 0x05

	7	6	5	4	3	2	1	0
	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
Access	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Reset	0	0	0	0	0	0	0	0

Bits 7:0 – PORTBn: Port B Data [n = 0:7]

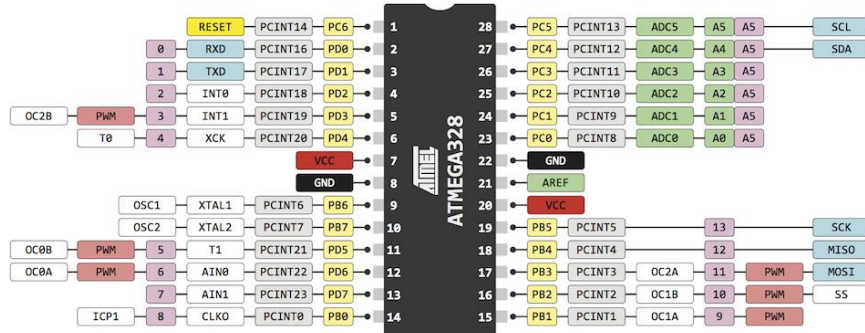
Write a program that will create the following sequence of lights on PB0..PB3

PB3	PB2	PB1	PB0
			
			
			
			

Once PB3 is on the next output should go back to PB0 being on. There should be a 300ms delay between each step. The program should repeat indefinitely. All outputs should be sent one at a time. **Bonus** if you can figure out how to use a 8 bit (char) array to hold the values to be sent the port.

THE
DEFINITIVE
ATMEGA328
&Arduino
PINOUT DIAGRAM

Black	GND
Red	Power
Yellow	Control
Blue	Physical Pin
Light Blue	Port Pin
White	Pin Function
Green	Digital Pin
Light Green	Analog Related Pin
Pink	PWM Pin
Light Purple	Serial Pin
Light Blue	IDC



Remember that Arduino pins and Atmega pins are NOT the same. PB0 is on the IC on pin 14 but on the Arduino headers it is IO Pin 8 (for example).

To test, use four LED's and four 330Ω resistors. Connect the LED's + lead to Arduino Digital pins 8,9,10,11 respectively, connect each of the – leads to one side of the 330Ω resistor and connect the other side of the resistors to the any of the Arduino's ground pins.

So the circuit will look like:

