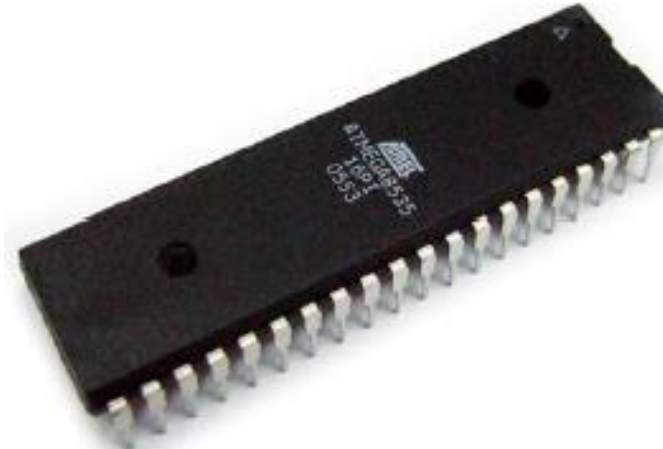
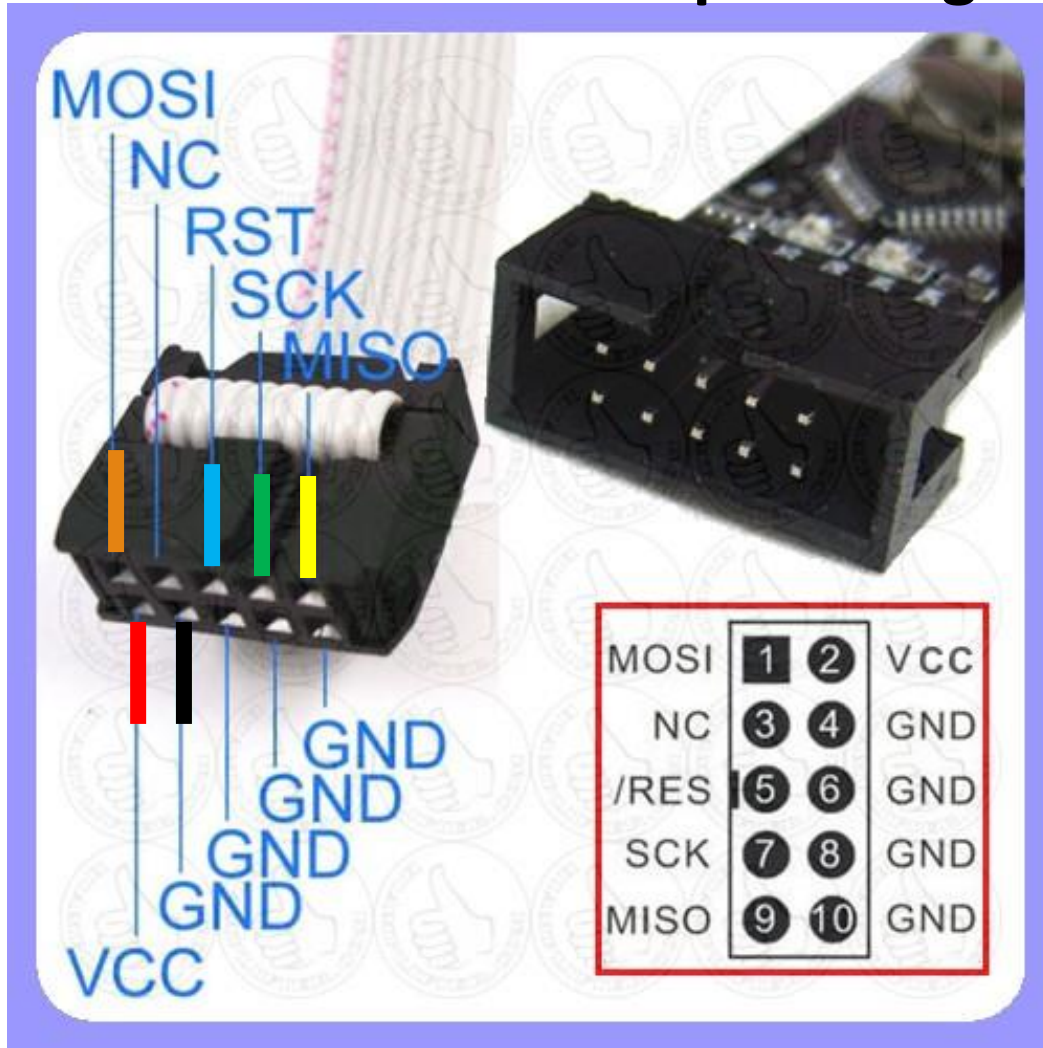


Microcontrolador ATmega16A

(XCK/T0) PB0	1	40	PA0 (ADC0)
(T1) PB1	2	39	PA1 (ADC1)
(INT2/AIN0) PB2	3	38	PA2 (ADC2)
(OC0/AIN1) PB3	4	37	PA3 (ADC3)
(SS) PB4	5	36	PA4 (ADC4)
(MOSI) PB5	6	35	PA5 (ADC5)
(MISO) PB6	7	34	PA6 (ADC6)
(SCK) PB7	8	33	PA7 (ADC7)
RESET	9	32	AREF
VCC	10	31	GND
GND	11	30	AVCC
XTAL2	12	29	PC7 (TOSC2)
XTAL1	13	28	PC6 (TOSC1)
(RXD) PD0	14	27	PC5
(TXD) PD1	15	26	PC4
(INT0) PD2	16	25	PC3
(INT1) PD3	17	24	PC2
(OC1B) PD4	18	23	PC1 (SDA)
(OC1A) PD5	19	22	PC0 (SCL)
(ICP1) PD6	20	21	PD7 (OC2)

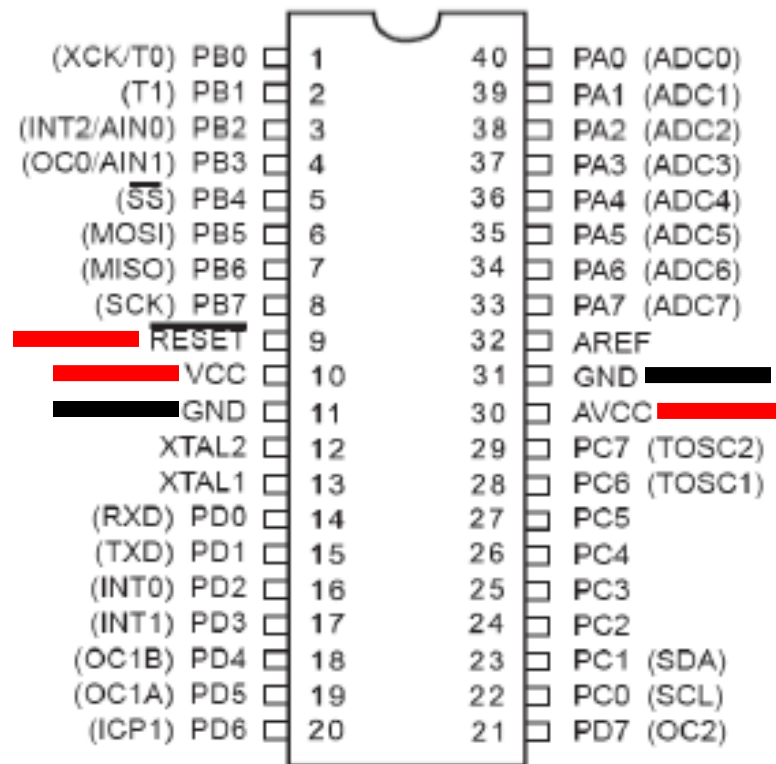


Conexiones para carga de programa al ATmega16A

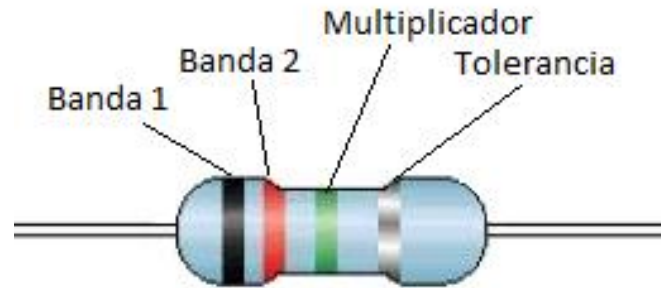


(XCK/T0) PB0	1	40	PA0 (ADC0)
(T1) PB1	2	39	PA1 (ADC1)
(INT2/AIN0) PB2	3	38	PA2 (ADC2)
(OC0/AIN1) PB3	4	37	PA3 (ADC3)
(SS) PB4	5	36	PA4 (ADC4)
(MOSI) PB5	6	35	PA5 (ADC5)
(MISO) PB6	7	34	PA6 (ADC6)
(SCK) PB7	8	33	PA7 (ADC7)
RESET	9	32	AREF
VCC	10	31	GND
GND	11	30	AVCC
XTAL2	12	29	PC7 (TOSC2)
XTAL1	13	28	PC6 (TOSC1)
(RXD) PD0	14	27	PC5
(TXD) PD1	15	26	PC4
(INT0) PD2	16	25	PC3
(INT1) PD3	17	24	PC2
(OC1B) PD4	18	23	PC1 (SDA)
(OC1A) PD5	19	22	PC0 (SCL)
(ICP1) PD6	20	21	PD7 (OC2)

Sistema mínimo ATmega16A



Resistencias



RESISTENCIAS				
	Banda1	Banda 2	Multiplicador	Tolerancia
PLATA				<input type="checkbox"/> 10%
ORO				<input type="checkbox"/> 5%
NEGRO	<input type="text"/>	- <input type="text"/>	<input type="text"/> x 1	
CAFÉ	<input type="text"/> 1	<input type="text"/> 1	<input type="text"/> x 10	<input type="checkbox"/> 1%
ROJO	<input type="text"/> 2	<input type="text"/> 2	<input type="text"/> x 100	<input type="checkbox"/> 2%
NARANJA	<input type="text"/> 3	<input type="text"/> 3	<input type="text"/> x 1000 (1k)	
AMARILLO	<input type="text"/> 4	<input type="text"/> 4	<input type="text"/> x 10 000	
VERDE	<input type="text"/> 5	<input type="text"/> 5	<input type="text"/> x 1 000 000 (1M)	<input type="checkbox"/> 0.5%
AZUL	<input type="text"/> 6	<input type="text"/> 6		
VIOLETA	<input type="text"/> 7	<input type="text"/> 7		
GRIS	<input type="text"/> 8	<input type="text"/> 8		
BLANCO	<input type="text"/> 9	<input type="text"/> 9		
NINGUNO				<input type="checkbox"/> 20%

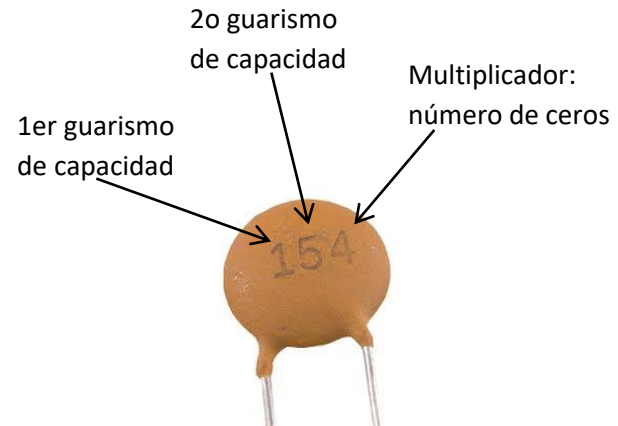
Capacitores



Capacitor cerámico

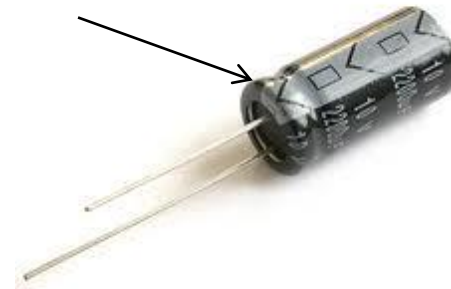


Capacitor electrolítico

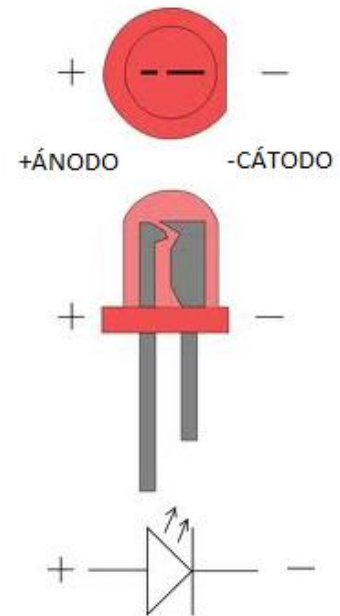
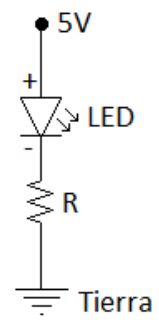


Factor	Prefijo	Símbolo
10^3	kilo-	k
10^{-1}	deci-	d
10^{-2}	centi-	c
10^{-3}	milli-	m
10^{-6}	micro-	μ
10^{-9}	nano-	n
10^{-12}	pico-	p

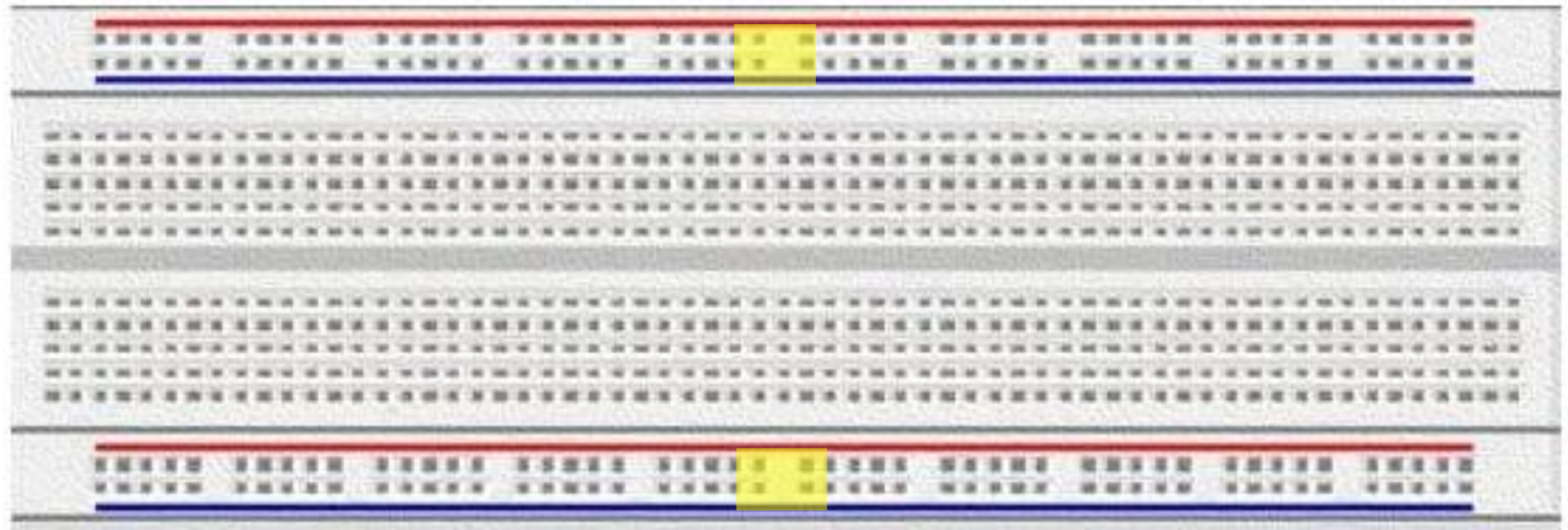
Indicador del
lado negativo

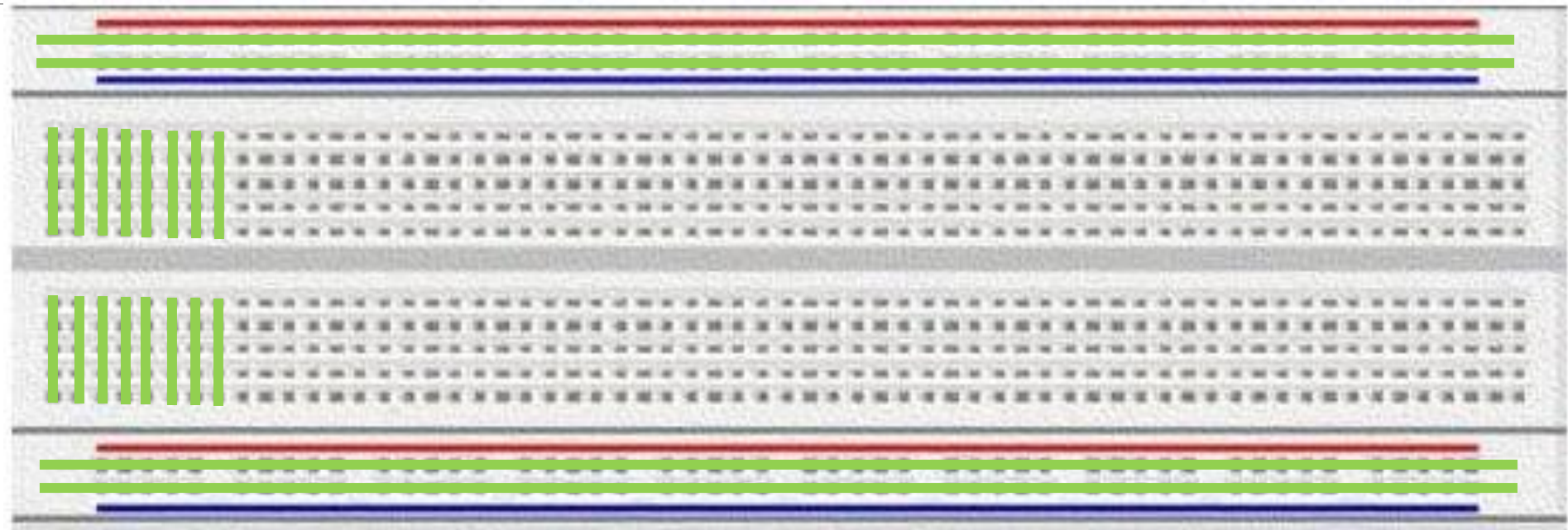


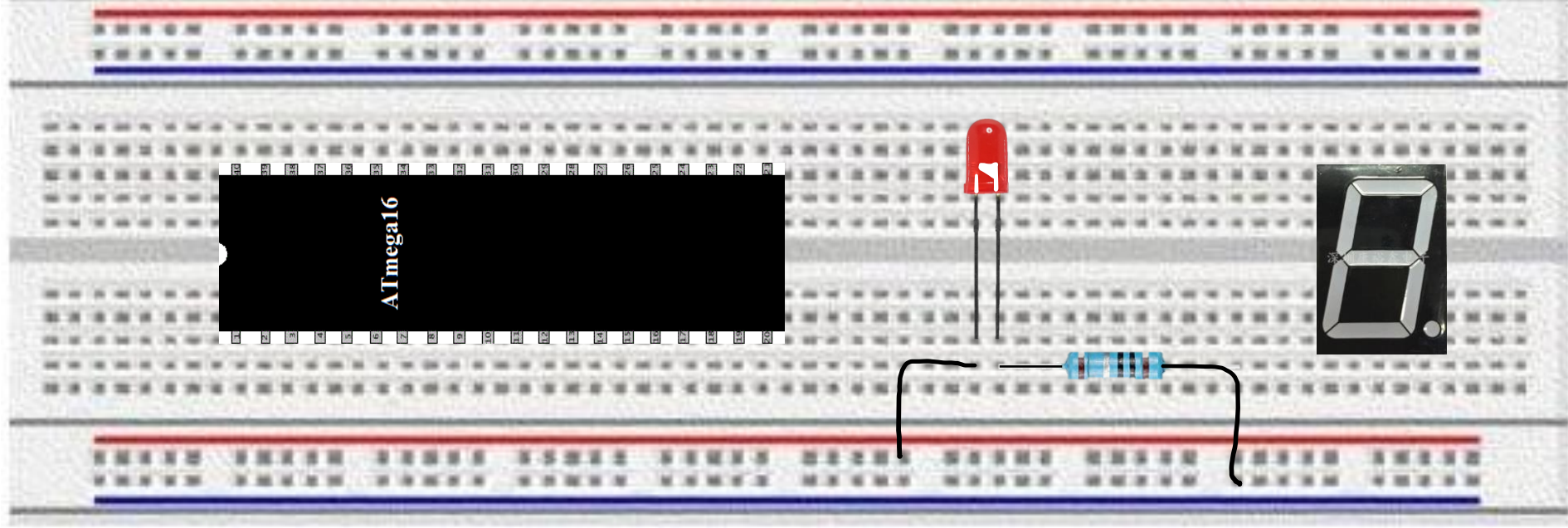
LEDs



Protoboard

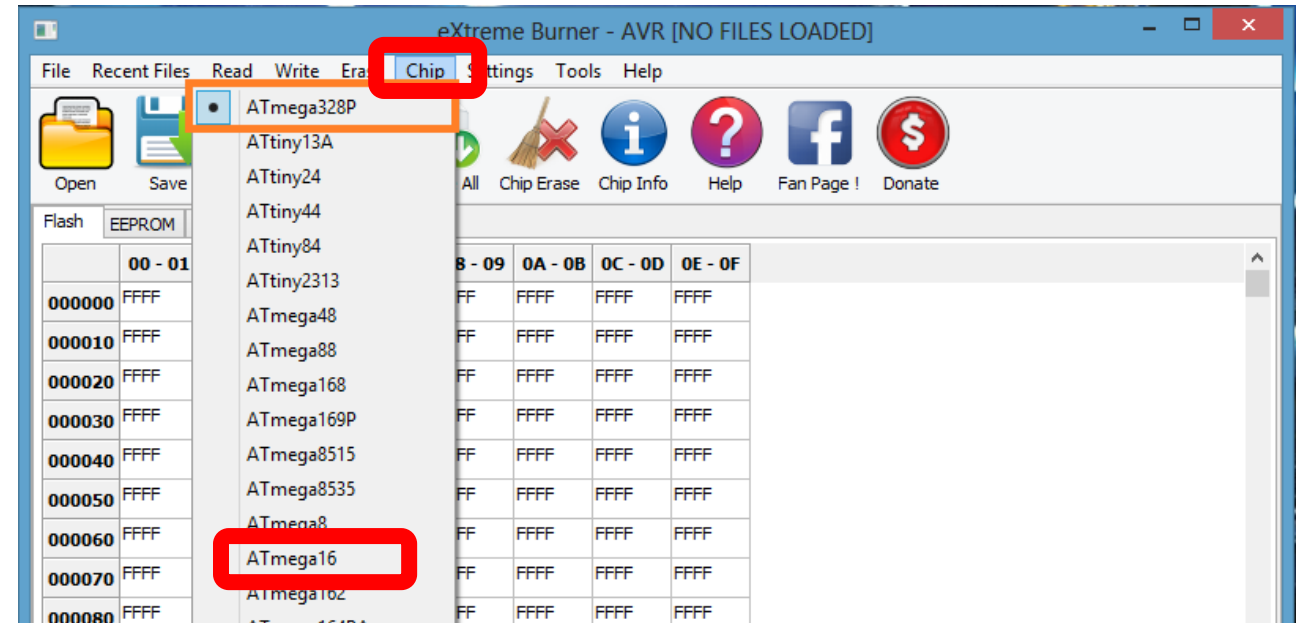
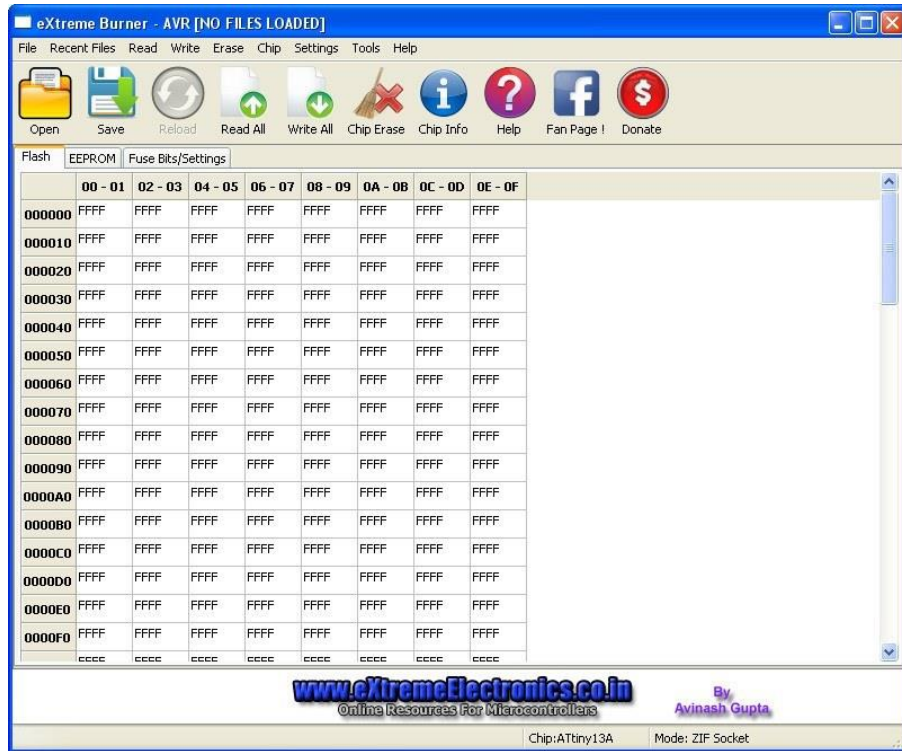






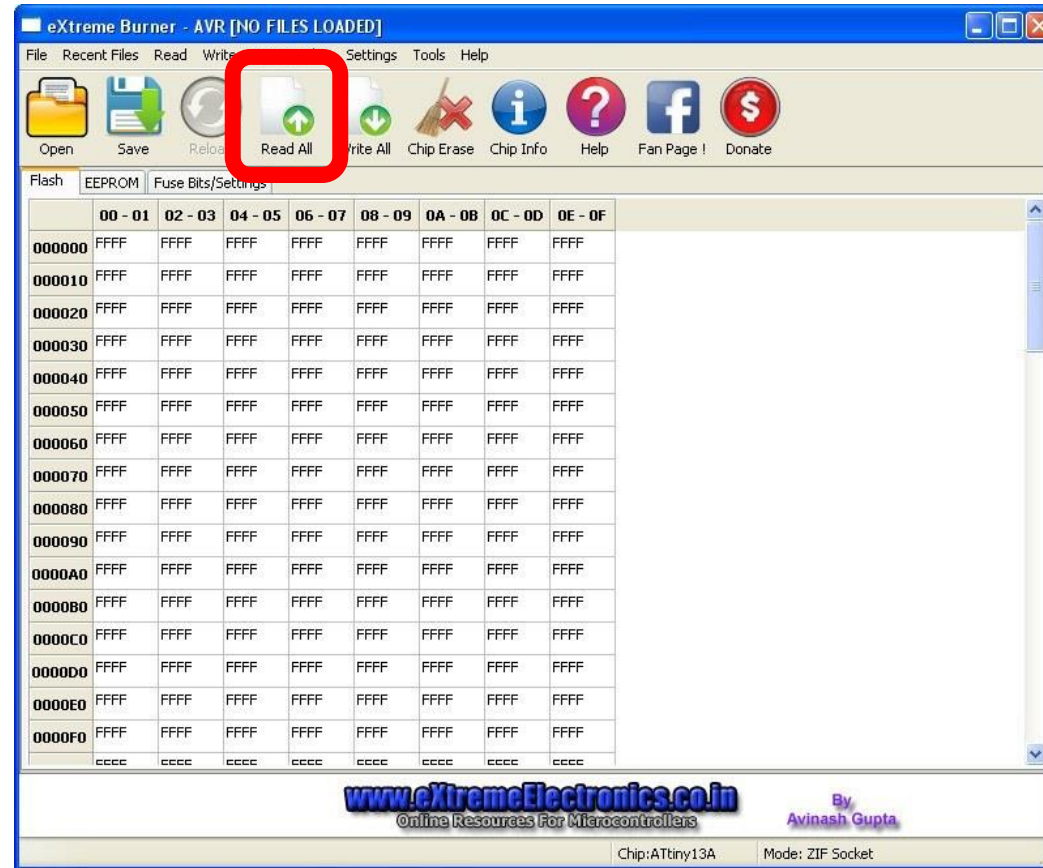
eXtreme Burner

(1° hay que seleccionar el microcontrolador...)



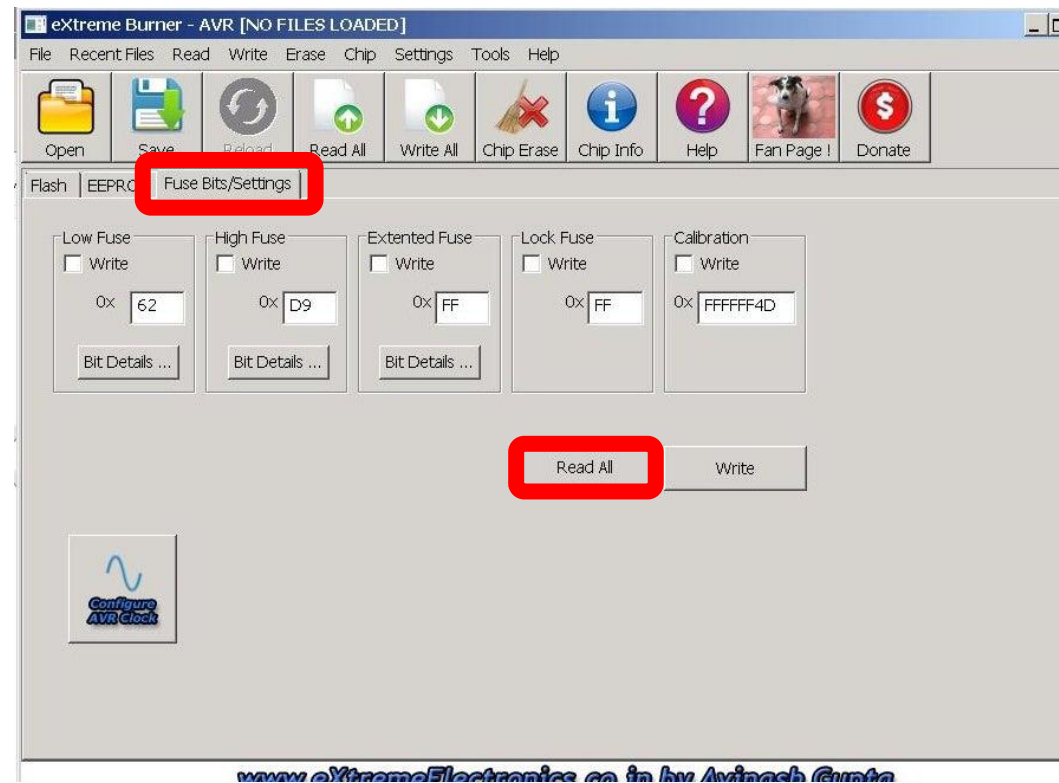
eXtreme Burner

(... y ahora hay que probar si funciona correctamente...)



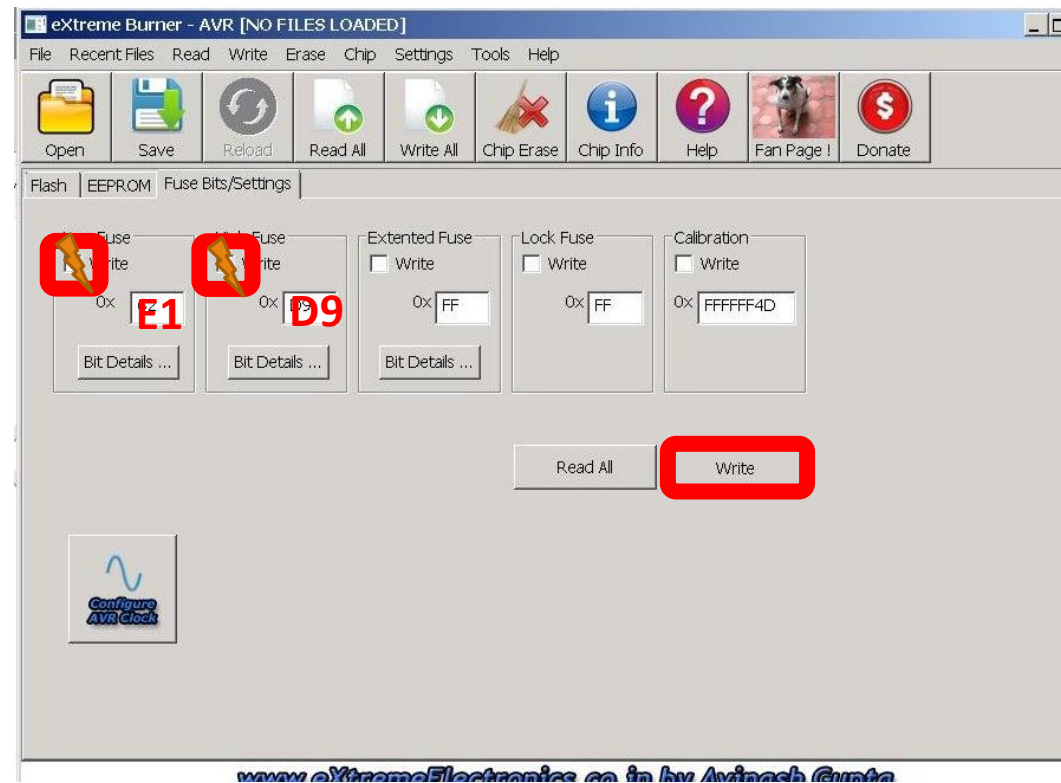
eXtreme Burner

(... y vamos a la pestaña de fusibles...)

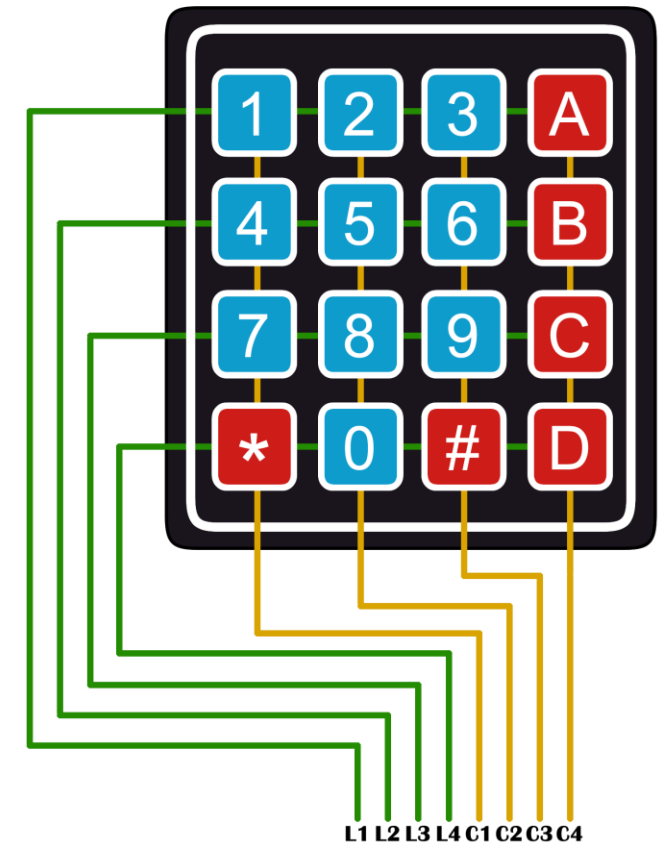
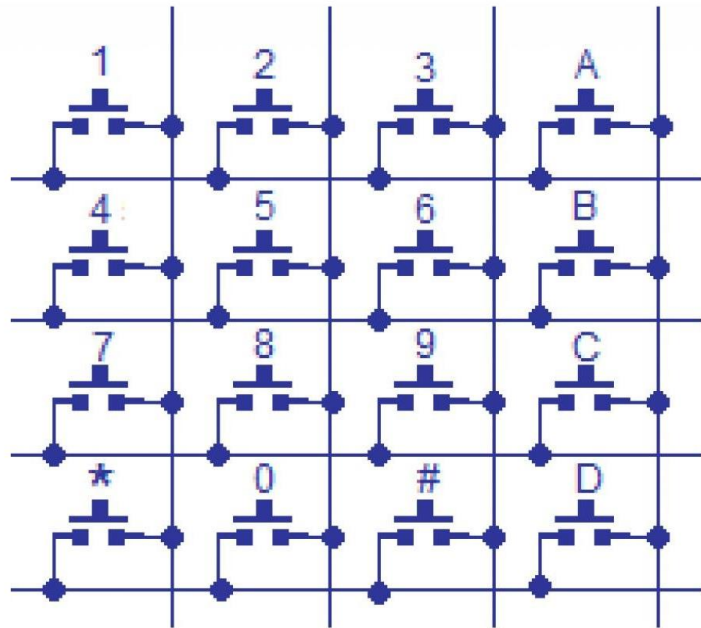


eXtreme Burner

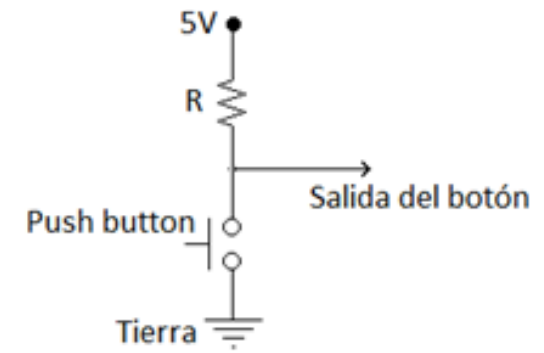
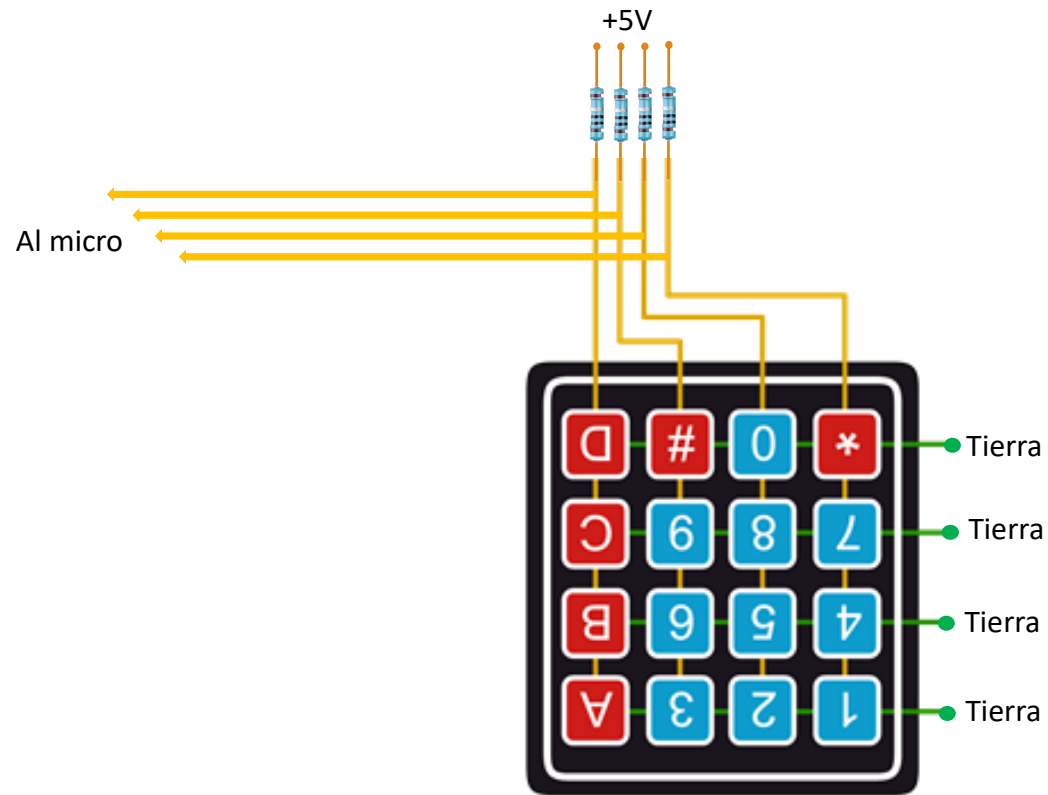
(... y adecuamos los fusibles de acuerdo a lo que necesitamos...)



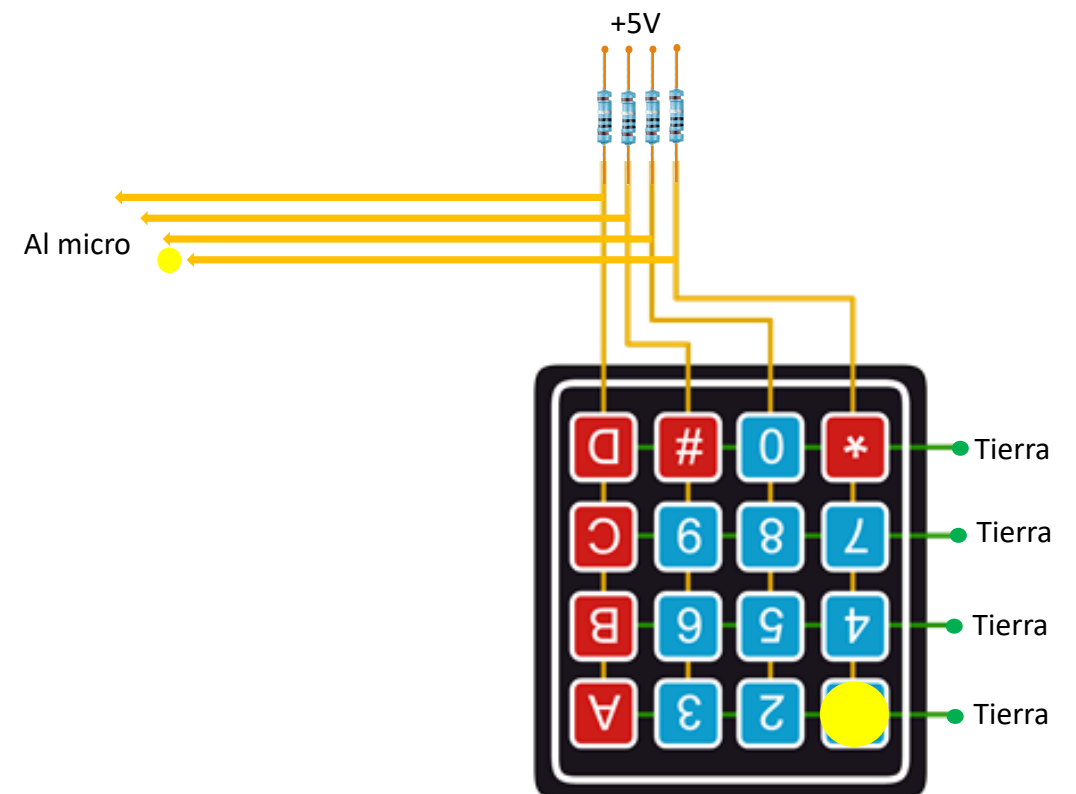
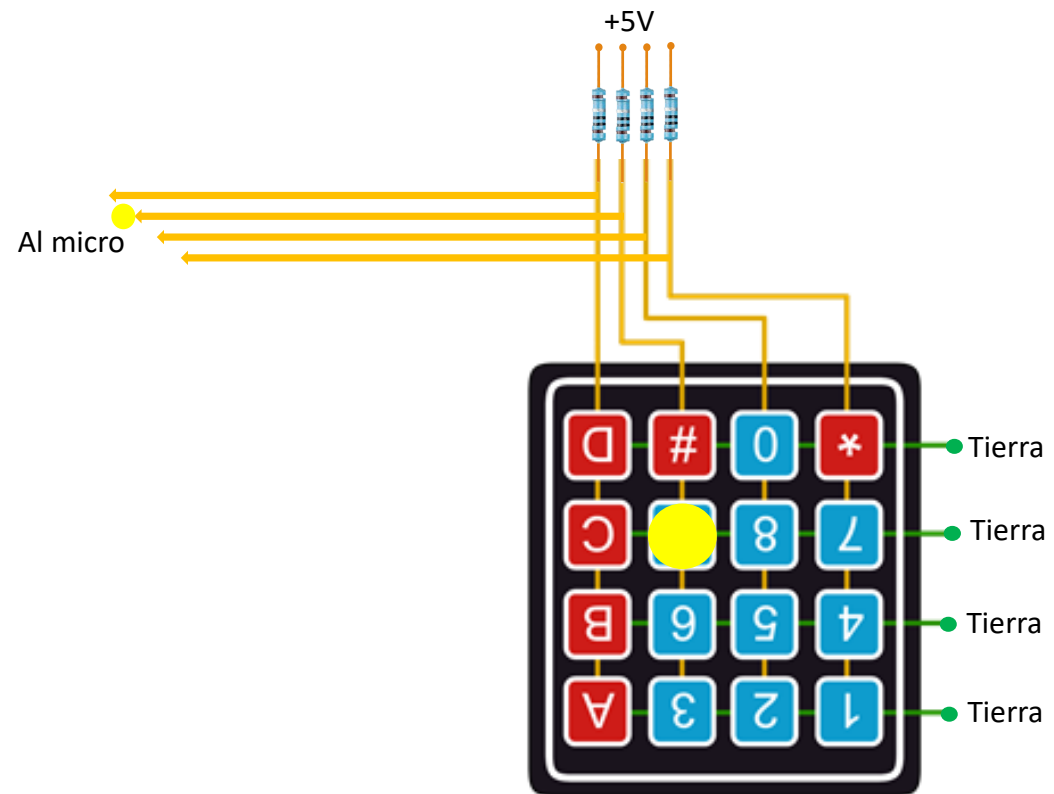
Teclado Matricial



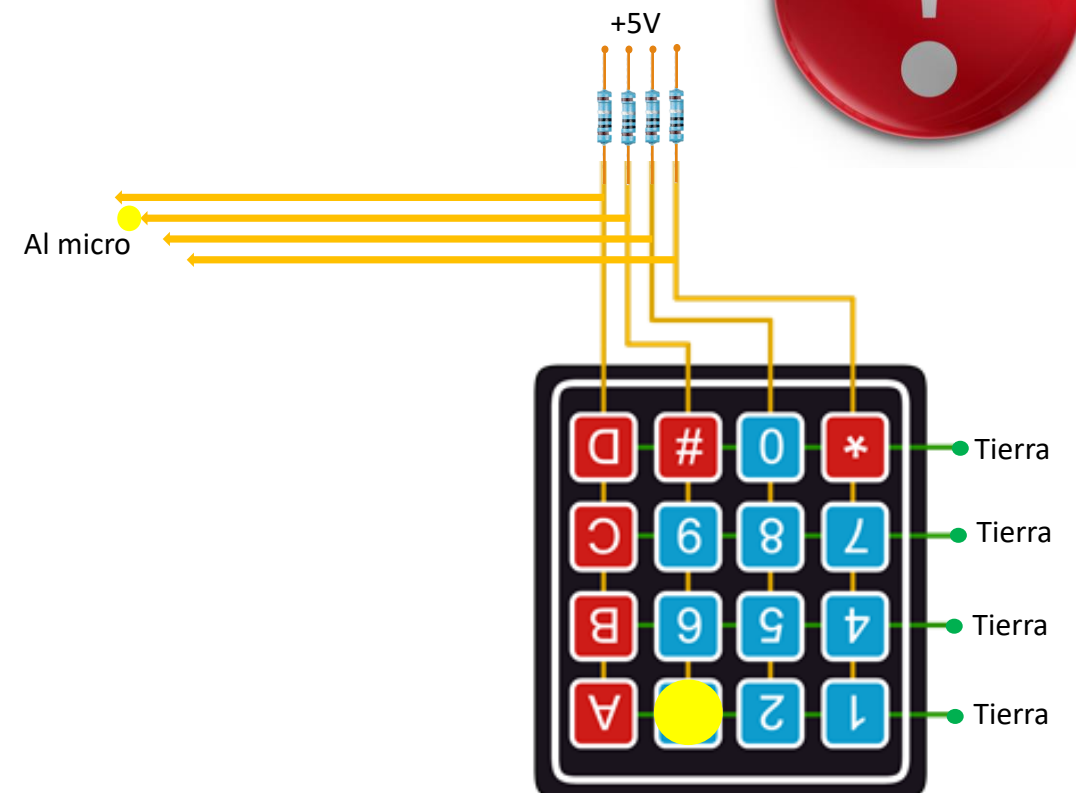
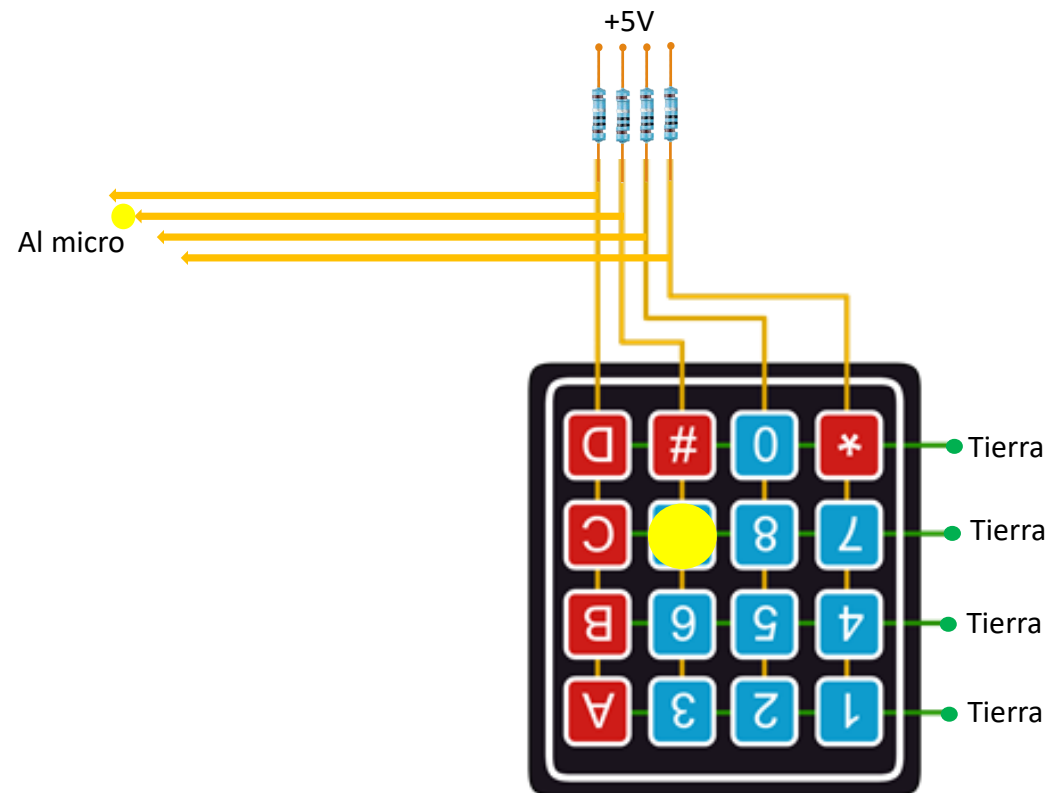
Teclado Matricial



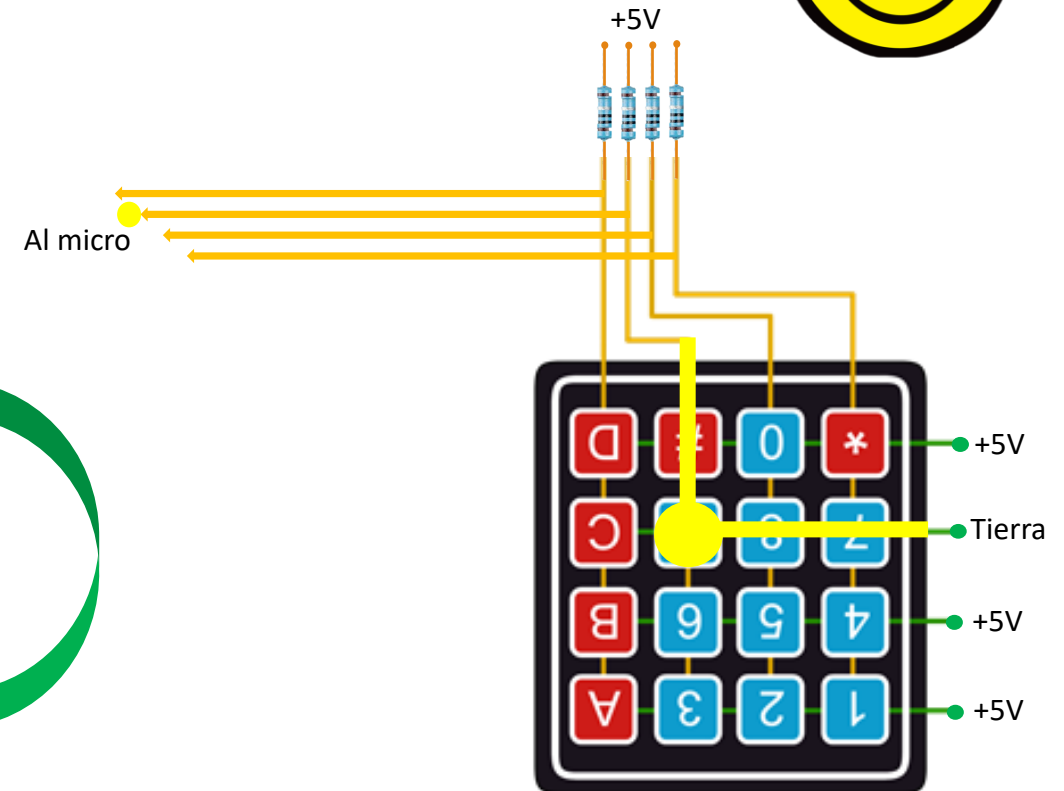
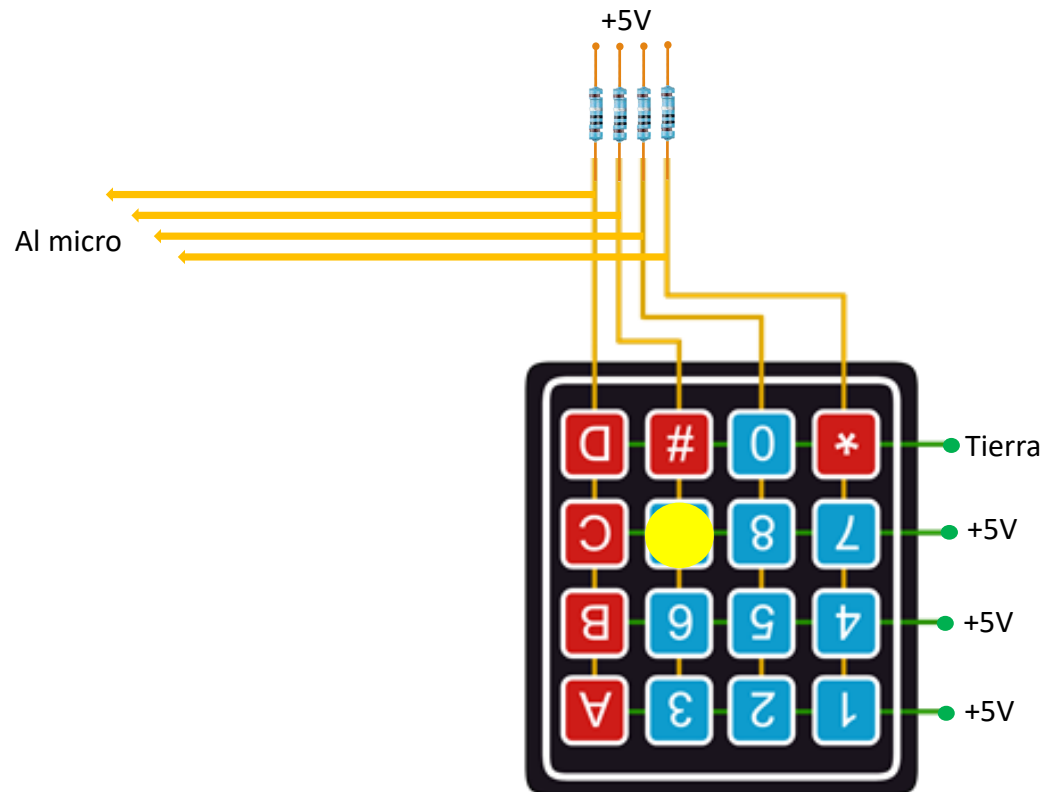
Teclado Matricial



Teclado Matricial (Ejemplo con problema)

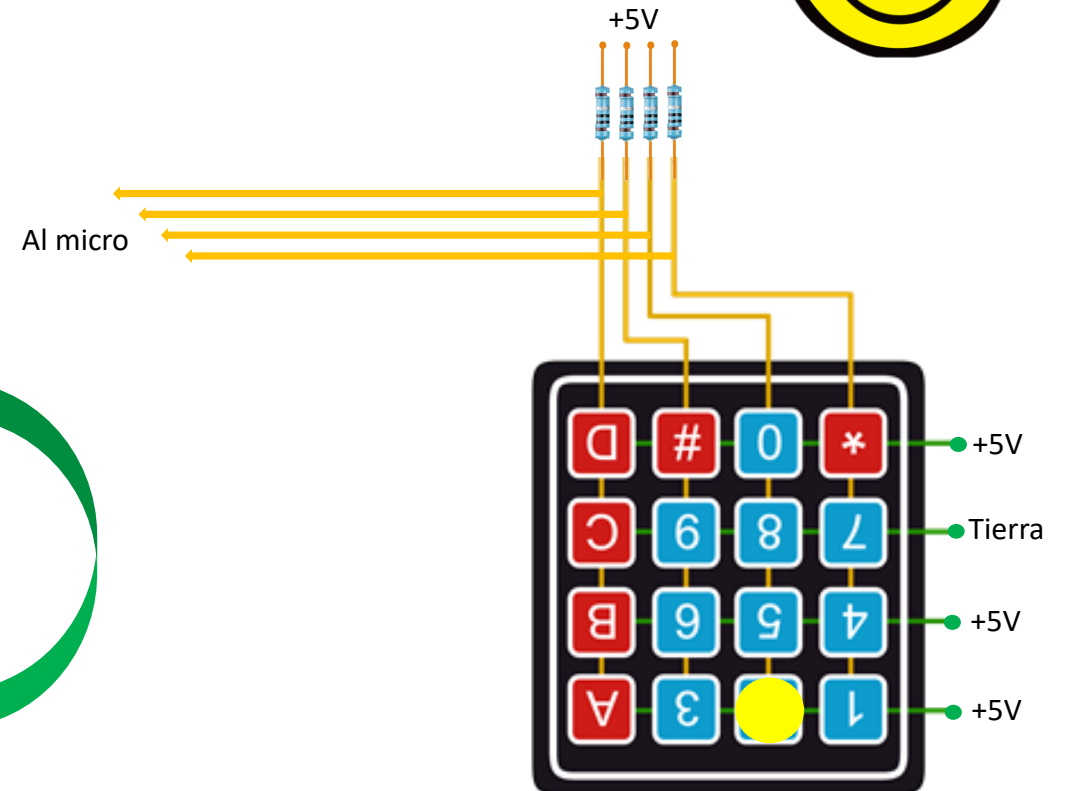
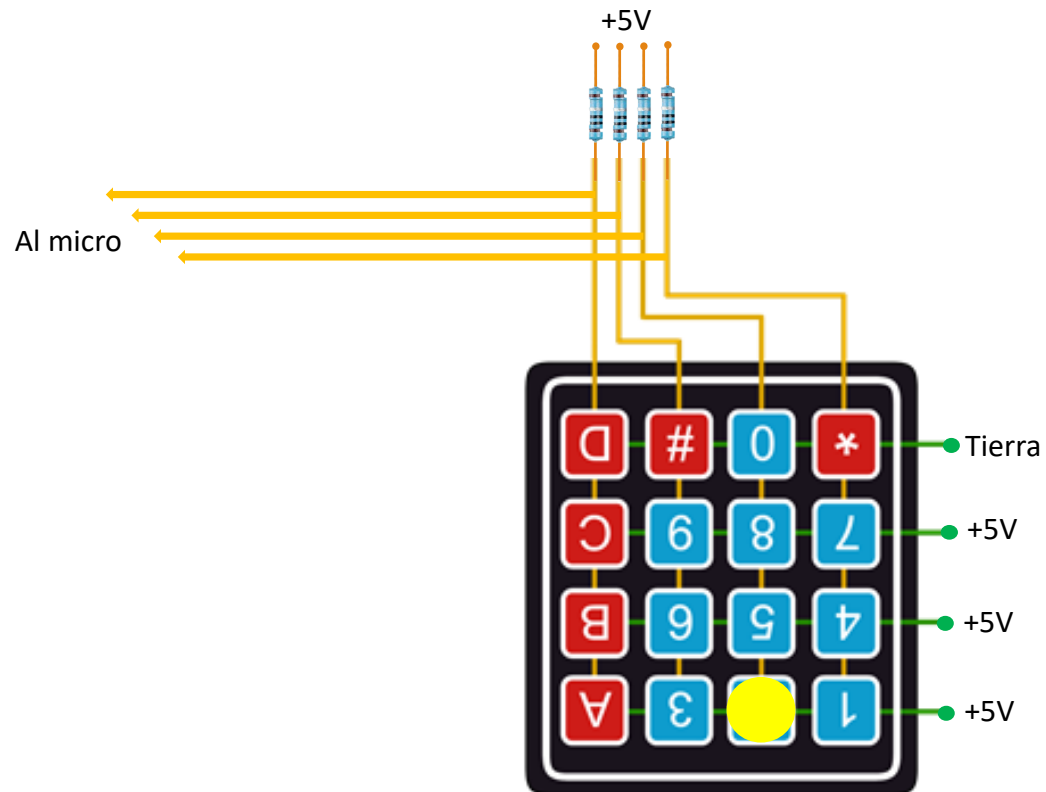


Teclado Matricial (Ejemplo con solución)



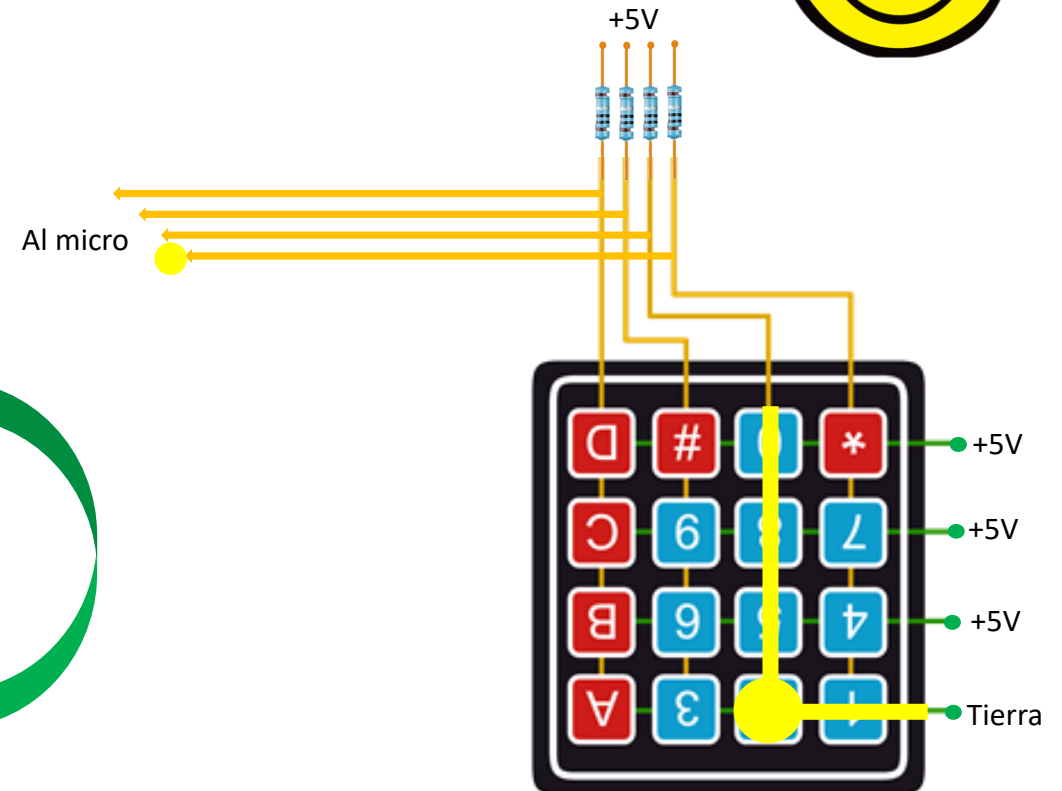
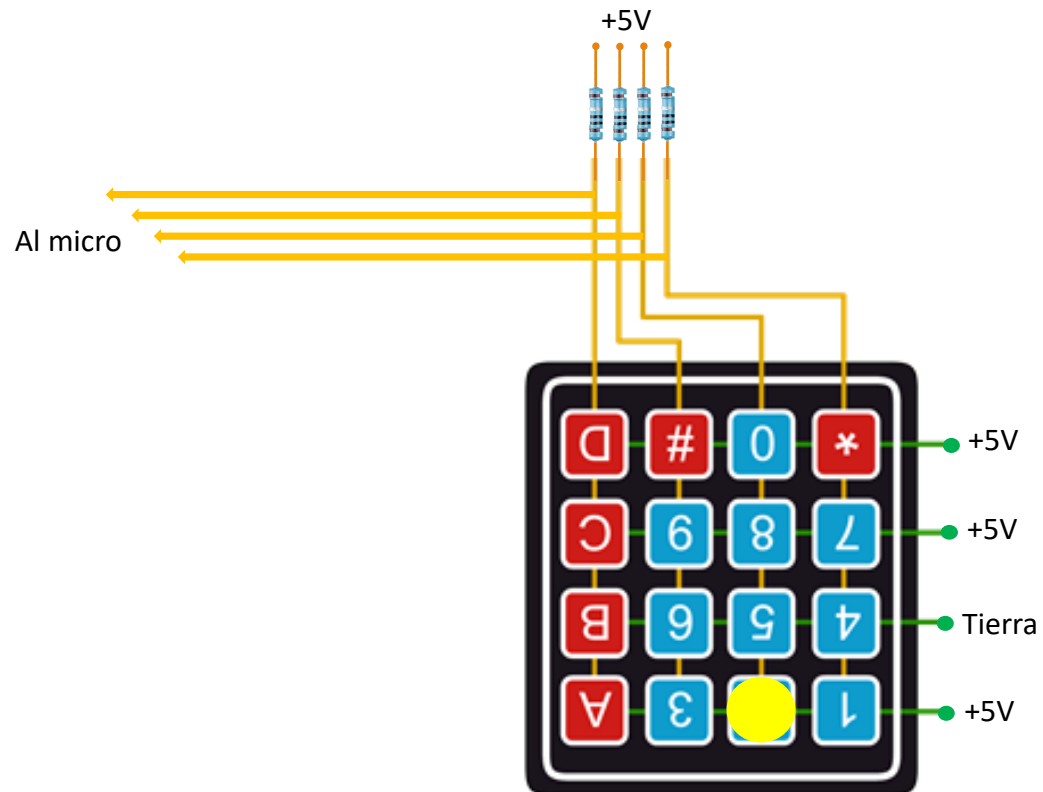
Teclado Matricial

(Otro ejemplo... primera parte)

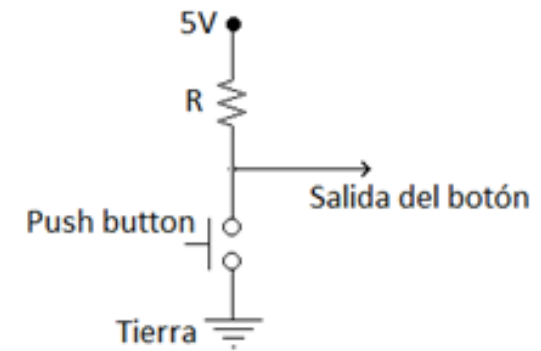
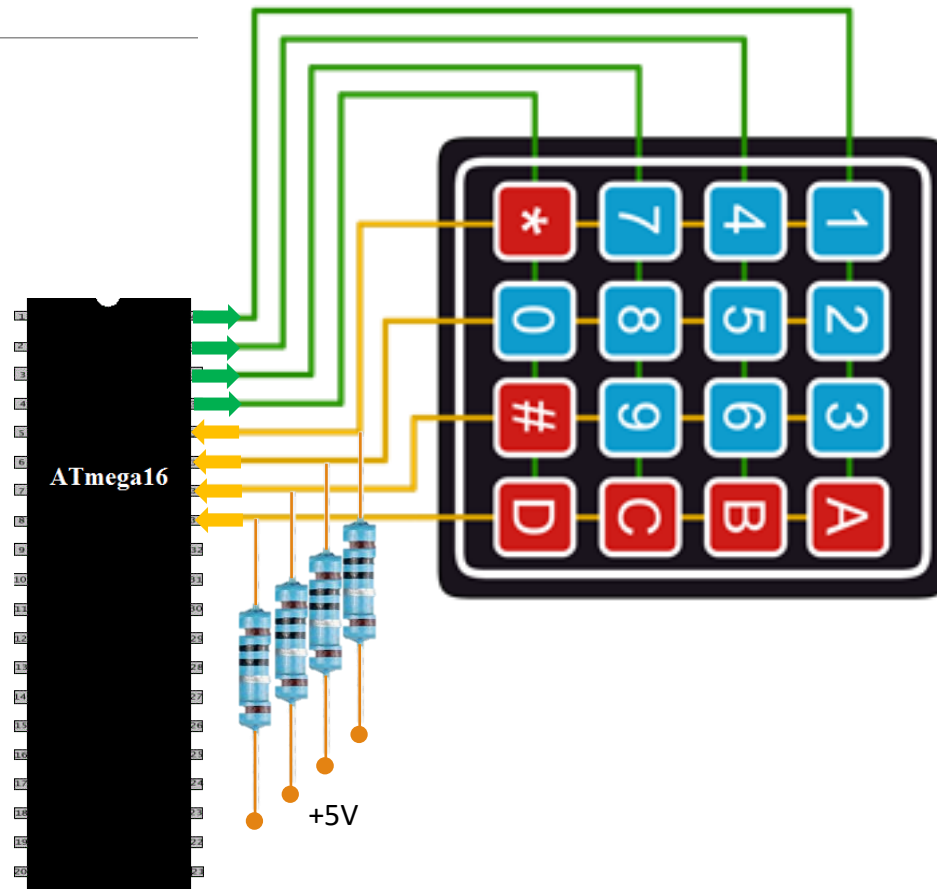


Teclado Matricial

(Otro ejemplo... segunda parte)



Teclado Matricial (con pull ups externas)



Teclado Matricial (conexiones finales)

