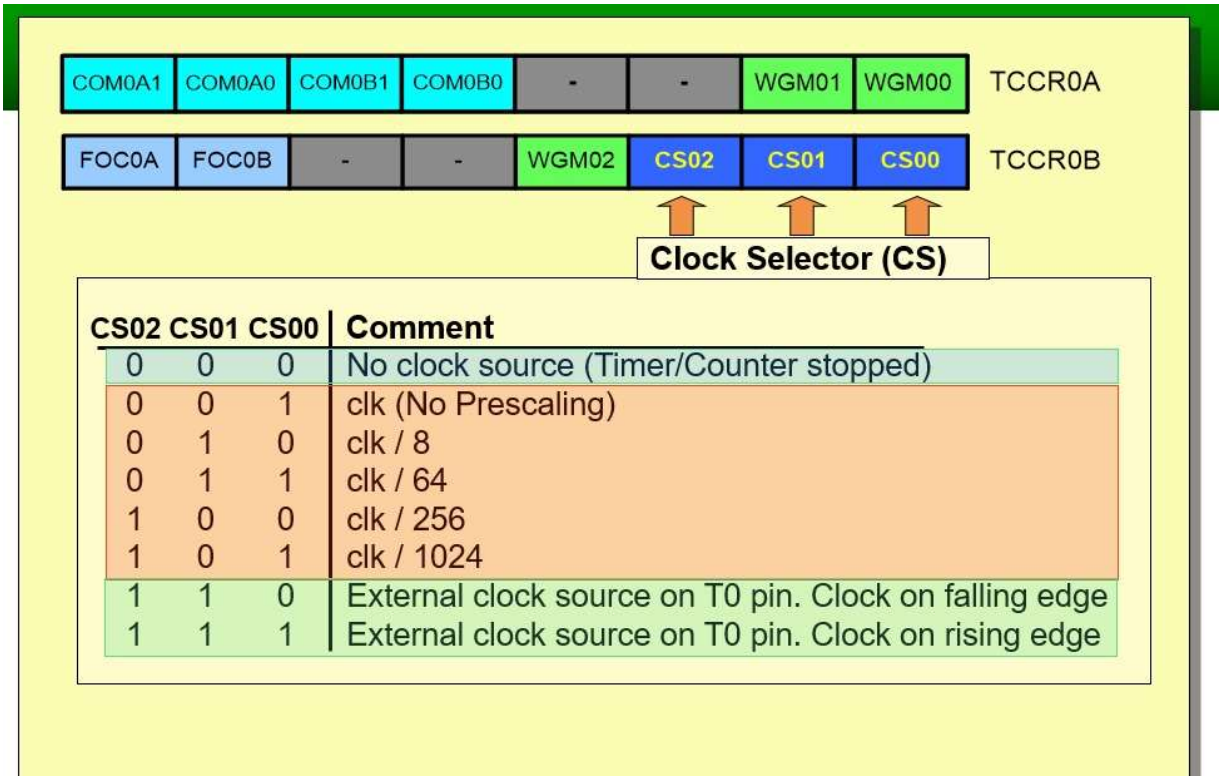
Lab 5

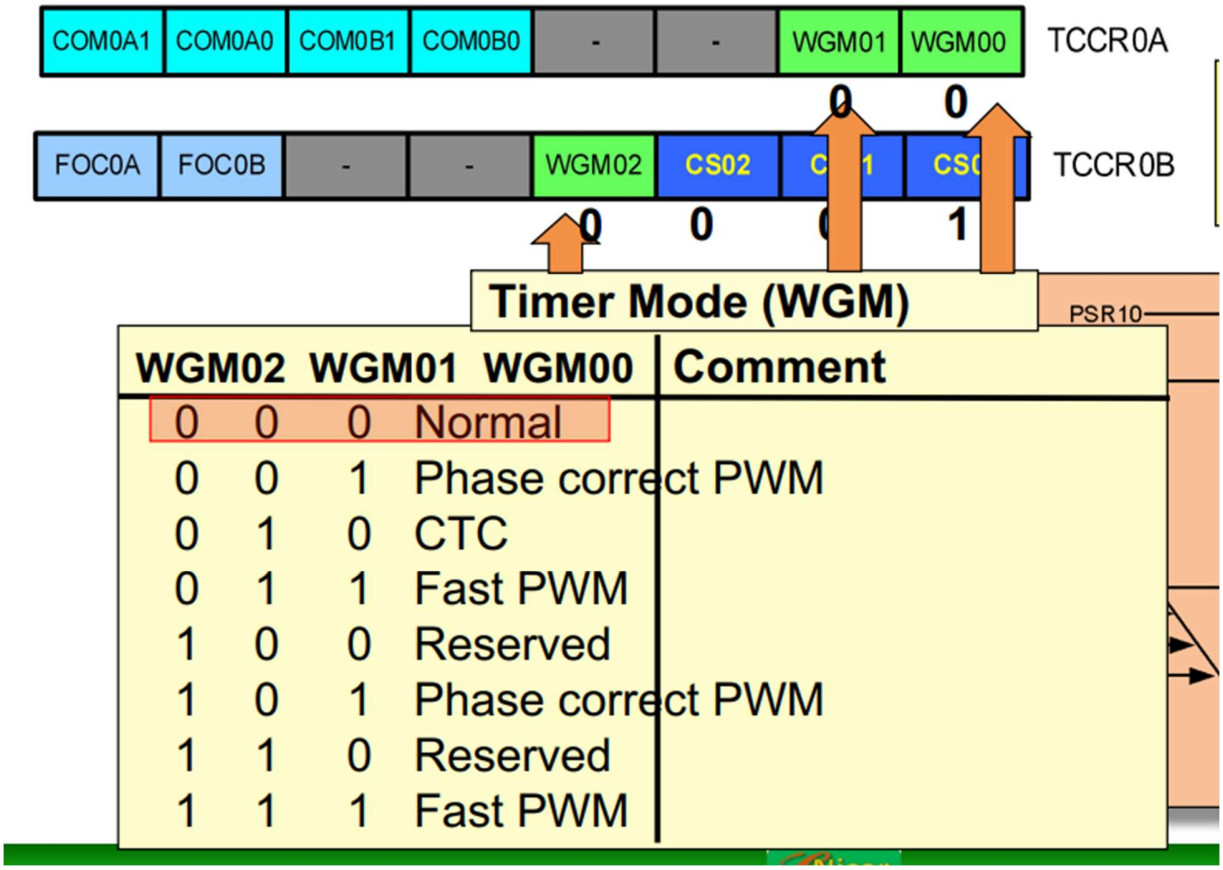
1- Write a C program using a Timer (Normal mode) to generate a 500 Hz square wave frequency on pin PORTC.2.
   a. Then examine the frequency using the oscilloscope.
   b. Modify the count value to make sure that the frequency is exactly 500 Hz.

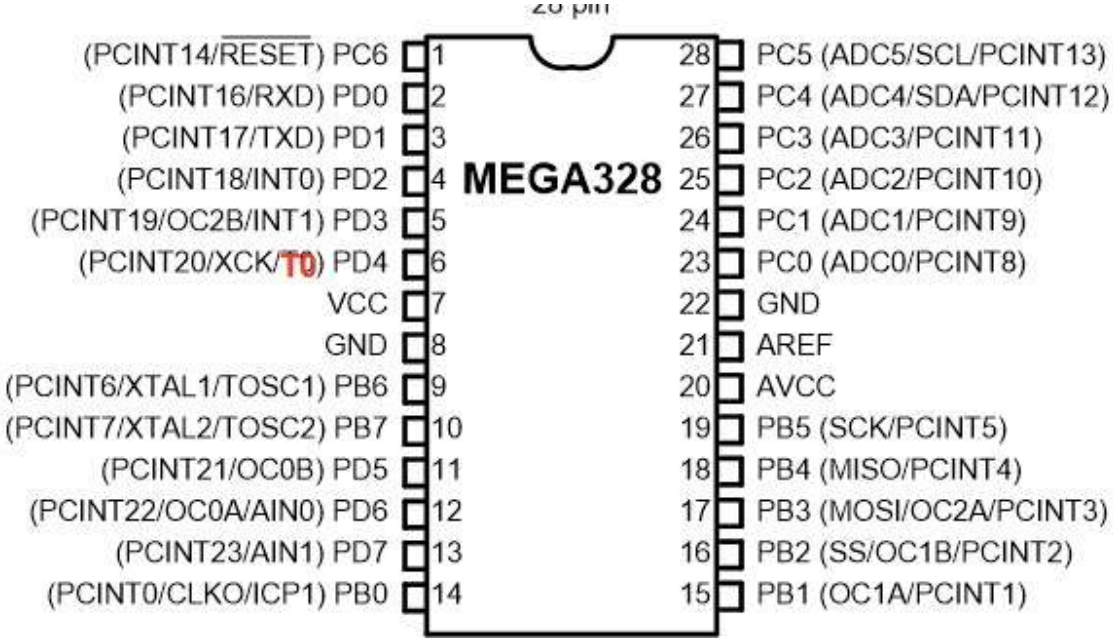
2- Rewrite task 1, using the CTC mode with 1000Hz.

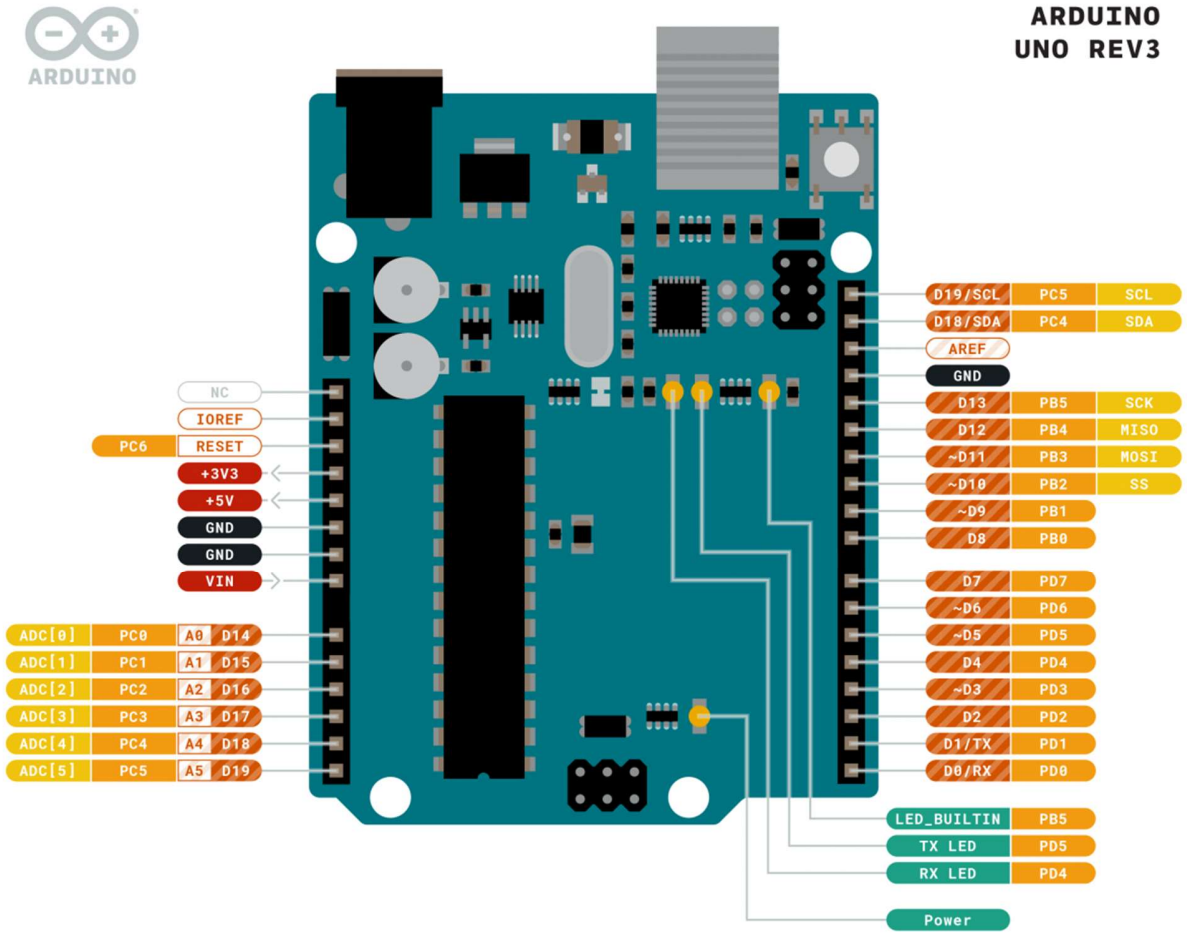
3- Connect a key to PORTD.4. Using Timer/Counter0, write a C program to output high PORTB.5, when the key is pressed, 5 times then low when the key is pressed 3 times.



CS02	CS01	CS00	Comment
0	0	0	No clock source (Timer/Counter stopped)
0	0	1	clk (No Prescaling)
0	1	0	clk / 8
0	1	1	clk / 64
1	0	0	clk / 256
1	0	1	clk / 1024
1	1	0	External clock source on T0 pin. Clock on falling edge
1	1	1	External clock source on T0 pin. Clock on rising edge


COM0A1
COM0A0
COM0B1
COM0B0
-
-
WGM01
WGM00
TCCR0A
0
0
FOC0A
FOC0B
-
-
WGM02
CS02
CS0
TCCR0B
0
0
1
Timer Mode (WGM)
PSR10
WGM02 WGM01 WGM00 Comment
0 0 0 Normal
0 0 1 Phase correct PWM
0 1 0 CTC
0 1 1 Fast PWM
1 0 0 Reserved
1 0 1 Phase correct PWM
1 1 0 Reserved
1 1 1 Fast PWM


28 pin
(PCINT14/RESET) PC6 1
(PCINT16/RXD) PD0 2
(PCINT17/TXD) PD1 3
(PCINT18/INT0) PD2 4
(PCINT19/OC2B/INT1) PD3 5
(PCINT20/XCK/T0) PD4 6
VCC 7
GND 8
(PCINT6/XTAL1/TOSC1) PB6 9
(PCINT7/XTAL2/TOSC2) PB7 10
(PCINT21/OC0B) PD5 11
(PCINT22/OC0A/AIN0) PD6 12
(PCINT23/AIN1) PD7 13
(PCINT0/CLKO/ICP1) PB0 14
MEGA328
28 PC5 (ADC5/SCL/PCINT13)
27 PC4 (ADC4/SDA/PCINT12)
26 PC3 (ADC3/PCINT11)
25 PC2 (ADC2/PCINT10)
24 PC1 (ADC1/PCINT9)
23 PC0 (ADC0/PCINT8)
22 GND
21 AREF
20 AVCC
19 PB5 (SCK/PCINT5)
18 PB4 (MISO/PCINT4)
17 PB3 (MOSI/OC2A/PCINT3)
16 PB2 (SS/OC1B/PCINT2)
15 PB1 (OC1A/PCINT1)



Ground
Power
LED
Internal Pin
SWD Pin
Other Pin
Digital Pin
Analog Pin
Default
Microcontroller's Port