

# Project 06

## A simple light chaser (mode1: 10 single leds chaser, & mode2: 4 groups of 3 leds chaser -pattern flasher-)

#	Student ID	Student Name	Grade (10)
1			

Delivery Date	
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١. يتم تسليم المشروع في خلال أسبوعين من تاريخ عرضة، و يتم حذف درجتان و نصف من المشروع عن كل أسبوع تأخير ٢. يتم تسليم المشروع لمعيد المقرر مباشرة
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### CD4017 IC

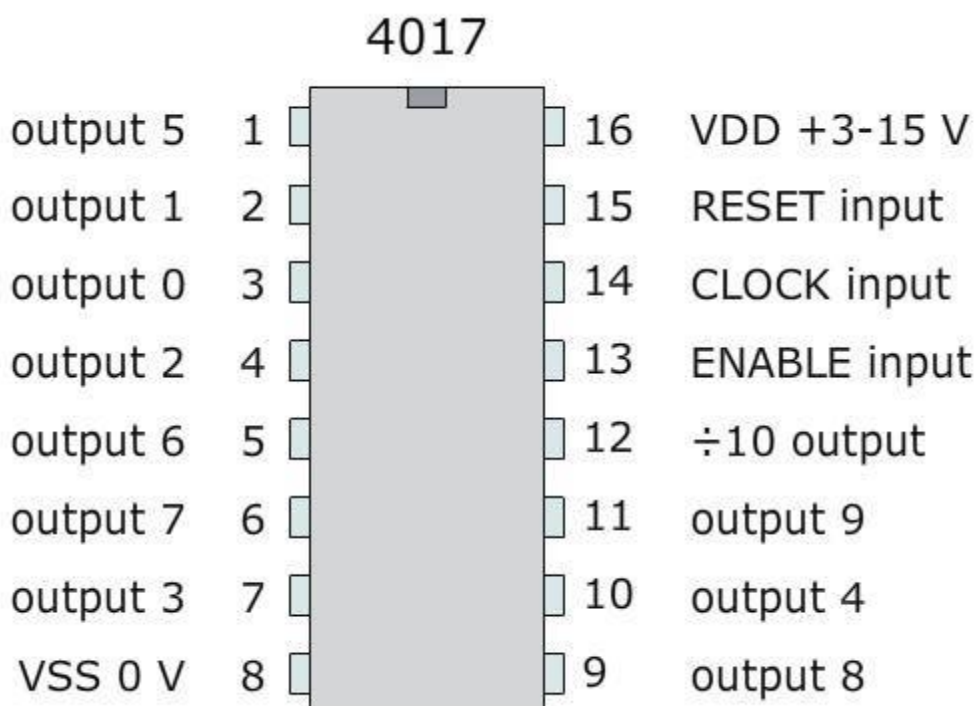
IC named IC 4017. It is a CMOS decade counter cum decoder circuit which can work out of the box for most of our low range counting applications. It can count from zero to ten and its outputs are decoded. This saves a lot of board space and time required to build our circuits when our application demands using a counter followed by a decoder IC. This IC also simplifies the design and makes debugging.

It has 16 pins and the functionality of each pin is explained as follows:

- Pin-1: It is the output 5. It goes high when the counter reads 5 counts.
- Pin-2: It is the output 1. It goes high when the counter reads 0 counts.
- Pin-3: It is the output 0. It goes high when the counter reads 0 counts.
- Pin-4: It is the output 2. It goes high when the counter reads 2 counts.
- Pin-5: It is the output 6. It goes high when the counter reads 6 counts.
- Pin-6: It is the output 7. It goes high when the counter reads 7 counts.
- Pin-7: It is the output 3. It goes high when the counter reads 3 counts.
- Pin-8: It is the Ground pin which should be connected to a LOW voltage (0V).
- Pin-9: It is the output 8. It goes high when the counter reads 8 counts.
- Pin-10: It is the output 4. It goes high when the counter reads 4 counts.
- Pin-11: It is the output 9. It goes high when the counter reads 9 counts.
- Pin-12: This is divided by 10 output which is used to cascade the IC with another counter so as to enable counting greater than the range supported by a single IC 4017. By cascading with another 4017 IC, we can count up to 20 numbers. We can increase and increase the range of counting by cascading it with more and more IC 4017s. Each additional cascaded IC will increase the counting range by 10. However, it is not advisable to cascade more than 3 ICs as it may reduce the reliability of the count due to the occurrence glitches. If you need a counting range more than twenty or thirty, I advise you to go with conventional procedure of using a binary counter followed by a corresponding decoder.
- Pin-13: This pin is the disable pin. In normal mode of operation, this is connected to ground or logic LOW voltage. If this pin is connected to logic HIGH voltage, then the circuit will stop receiving pulses and so it will not advance the count irrespective of number of pulses received from the clock.

- Pin-14: This pin is the clock input. This is the pin from where we need to give the input clock pulses to the IC in order to advance the count. The count advances on the rising edge of the clock.
- Pin-15: This is the reset pin which should be kept LOW for normal operation. If you need to reset the IC, then you can connect this pin to HIGH voltage.
- Pin-16: This is the power supply (Vcc) pin. This should be given a HIGH voltage of 3V to 15V for the IC to function.

This IC is very useful and also user friendly. To use the IC, just connect it according to the specifications described above in the pin configuration and give the pulses you need to count to the pin-14 of the IC. Then you can collect the outputs at the output pins. When the count is zero, Pin-3 is HIGH. When the count is 1, Pin-2 is HIGH and so on as described above.



### Mode1: 10 single leds chaser

This is the circle 10 LED running light as another kind of string light circuit. Which is running light on circle each one step beautifully and can adjust speed as well.

From circuit will see that we use two ICs. Which is IC1-NE555 as timer IC with a widely used general. In this circuit will use the IC-555 as the square wave generator to output. Which that frequency is determined by R-100K, R-100K ohms and C-10uF 16V.

When IC1-NE555 generate the frequency up, will be entered to IC2-CD4017 by through way of R 100 ohms. IC2 is Decade Counter IC will provide output is positive voltage Sort by Position according to input signal from IC1-NE555 One end of the LED all. Which is pin K to pooling through R 1K to ground to as the through way of current.

### Mode2: 4 groups of 3 leds chaser –pattern flasher-)

The circuit uses a 555 timer oscillator to supply clock pulses of a variable frequency to the **4017 decade counter**. The decade counter only needs to have three outputs so the fourth output goes into the reset pin to start the cycle all over again. The central red led is always on. Each row of four leds flash in sequence giving the impression that the light is rotating. It is an idea that works very well giving an eye-catching display. It will run continuously for three hours with a standard pp3 battery.

