

Task 1:

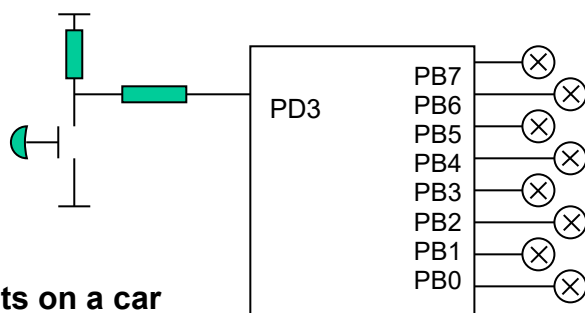
Write a program that turns **ON** and **OFF** a LED with a push button. The LED will be extinguished when pressing the button.

The program will use Interrupt. Connect the push buttons to PORT D.

The program should have a main program that runs in a loop and wait for the interrupts. An interrupt routine is called when the push button is pressed. Each time the button is pressed, the lamp should switch from 'OFF' to 'ON', or from 'ON' to 'OFF'.

Task 2: Switch – Ringcounter / Johnsoncounter, with interrupt

Write a program that by means of a switch can choose to flash 8 LEDs either in the form of a ring counter or in the form of a Johnson counter. Use the switch SW0 connected to PORTD to switch between the two counters. Each time the button is pressed, a shift between the two counters should take place. By using interrupts you'll swap directly with no delay.

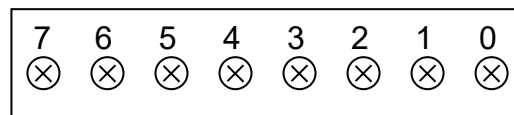


Task 3: Rear lights on a car

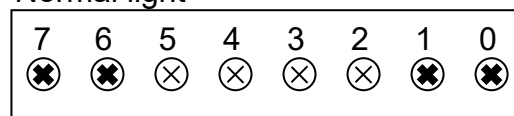
Interrupt.

Program that simulates the rear lights on a car

The 8 LEDs should behave like the rear lights.



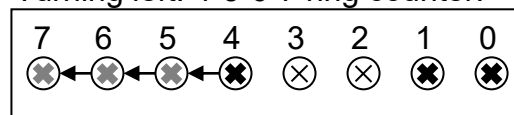
Normal light



Turning right. 3-2-1-0 ring counter.



Turning left. 4-5-6-7 ring counter.



Function:

Normal light: LED 0, 1, 6 and 7 'ON'.

Turning right:

LED 6 – 7 on, LED 0 – 3 blinking as RING counter.

Turning left:

LED 0 – 1 on, LED 4 – 7 blinking as RING counter.

See manual for how to set Interrupt registers: EICRA and EIMSK

Task 4: Rear lights on a car, with light for brakes

Add function for the stop light to the previous task. When braking, all LEDs light up, if blink on the right or left is not going on.

Turning right and brake:

LED 4 – 7 on, LED 0 – 3 blinking as RING counter.

Turning left and brake:

LED 0 – 3 on, LED 4 – 7 blinking as RING counter.

Use INT2 for the Brake.

