Miles Van de Wetering

Prelab 6

ECE 375

1) I choose Police Lights Toy. On this toy, there are four switches.
    a. When switch 1 is pressed, a big light flashes and a sound plays.
    b. When switch two is pressed, red and blue lights begin blinking.
    c. When switch three is pressed, white lights at the edges blink.
    d. When switch four is pressed, white lights in the middle blink.
2) Microcontroller features:
    a. Switch 1 is likely coded to detect a high signal (it was more like a lever. The light probably had a loop after which it remained on. Don't know how the sound played.
    b. Switch 2, 3, 4 likely used 16 bit timers plus some loop counters with interrupts that set the LED output bits to generate a continuous blink at a very slow pace. Perhaps PWM.
3) TXC is used when the app might care about whether all of the bits have been transmitted before releasing the BUS, and UDRE is used to indicate the UDR is empty, meaning that a character can be written to UDR and not transferred to the UDR until the current character is completely shifted out. Used to ensure maximum throughput.
4) The interrupt vector is $0024, and the flag to enable receiving data is RXEN in the UCSRB register.

References:

https://embeddedfreak.wordpress.com/2008/10/01/avr-udrie-vs-txc-interrupt/