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Proj\_1D\_Key\_press\_interrupt

ANOTHER VARIATION ON Proj\_1A  
illuminated in any given sweep.

This time not all sets of vertical LEDs are

## DISCOVERING A BIT MORE ABOUT THE ATMEGA HW

1. The Serial Port (UART): This is also known as the Universal Asynchronous Receiver Transmitter or just Receiver Transmitter (Rx/Tx). It enables communication with the PC. Because PCs require a USB connection a USB bridge is included on the UNO PCB. It provides an interface between the Atmega serial port and PC USB port.
2. HW register UCSRB: This is known as the UART Control and Status Register B. Bit 7 of this register is RXCIE0 (Rx complete interrupt enable). User code must set this bit to 1 if an interrupt is required when a character is received. Note also the registers used in `waitforkeypress()` and `receiveChar()`.
3. `ISR(USART_RX_vect){}` This is the ISR that responds to interrupts generated using keypresses made at the PC keyboard.

## INTRODUCING SOME NEW C TOPICS

1. The switch block: This includes a switch statement and the break instructions that cause program execution to exit the switch block.
2. Instructions `cli()`; used in combination with `sei()`; to temporarily disable interrupts.
3. The statement `row = row%2;` This gives the remainder of dividing the variable row by 2, it only takes on the values 0 and 1. (`A%2` is spoken as A modulo 2).
4. The Statement `while(A);` (See local version of `waitforkeypress()`). This halts program execution while A is non-zero. Similarly statement `while(!(A));` halts program execution while A is zero. A can be changed by an interrupt or by the hardware when for example the UART receives a character.

## PROGRAM OPERATION

The main process that of controlling the display is interrupted for a brief instant by a keypress. This calls an ISR that affects the main process, changing the number of leds that are skipped every time that the display increments.

## WHAT REALLY MATTERS HERE

The Rx interrupt (the keypress interrupt) and setting it up, subroutine `ISR(USART_RX_vect){}`, and the switch statement block.

## POSSIBLY for LATTER REVIEW

The division and logic might possibly be worth revisiting latter on but really they have just been included in an attempt to do something different.