Interrupts

Interrupts are a special kind of code that can run at ANY time. They can happen in the middle of some other kind of code, which is why they are called interrupts. They are particularly useful for buttons.

All computers use interrupts to control special situations like keyboard inputs, internet signals, and serious errors. For us, we will use interrupts to detect changes on a specific pin. For the Arduino Uno, the pins that we are allowed to use are pins 2 and 3.

To use interrupts, we write a handler function and then attach it to the interrupt. When the interrupt happens, the computer will pause whatever is happening, check if there is a function attached, and then run it if there is. To write an interrupt we have to make a void type ISR function like:
`void IR_ISR(){}` (The name can be different)
This function should be short and not use any delays. The smallest possible amount of code should be put in the ISR.

Then we just attach the interrupt by putting this function in setup():

`attachInterrupt(digitalPinToInterrupt(pin), ISR, mode).`

"`pin`" is the number (either 2 or 3 for us) of the pin that we are watching. "`ISR`" is the name of the function we wrote, without parenthesis. "`Mode`" is the type of change we want to activate on. The options are:

- **LOW** to trigger the interrupt whenever the pin is low,
- **CHANGE** to trigger the interrupt whenever the pin changes value
- **RISING** to trigger when the pin goes from low to high,
- **FALLING** for when the pin goes from high to low.

These options are all written in all caps ("CHANGE").