Arduino UNO workshop 1

1 Familiarize with the board

1. Get yourself familiarized with the UNO board. Locate the Atmega chip, the USB to serial convertger, all the digital pins, the analog input pins, the power pis, the pwm pins, the crystal oscillator, the reset button, usb connection and the power connection.
2. If not already done so, install the arduino software.
3. Run the software.
4. Connect Arduino UNO board to your computer using the USB cable.
5. Your computer may install your board when you connect it for the first time.
6. Go to tools→port and select the right com object for your arduino.

2 Blink LED

1. Open files→examples→basics→blink.
2. Construct the circuit show in Figure 1. The longer pin for the diode is positive. Do not forget the resistor in series if you don't want to damage your microcontroller.
3. Click the right arrow button in the software. This will upload the code to the microcontroller. Once uploaded, you shold see the LED blinking.
4. Go through the code to figure out all the relevant parts. Perform the following modifications:
   (a) Change the output pin from D13 to D12, modify your circuit and run again.
   (b) Change the timing between blinks.
   (c) Experiment with different patterns.

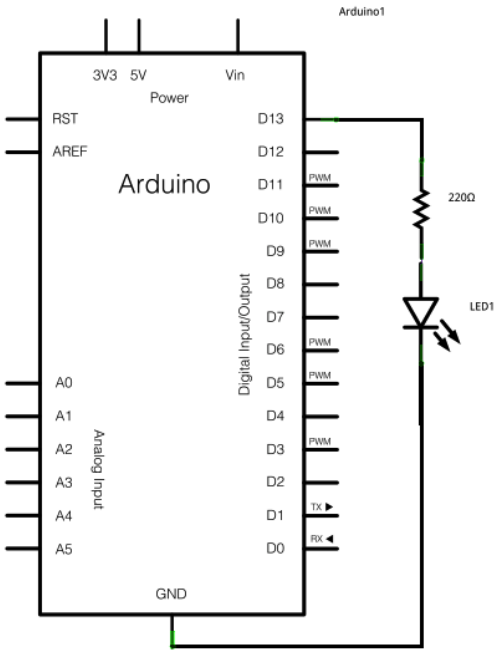

Figure 1: The circuit for led blink example

3 PWMs and fading

1. Open files→examples→basics→fade
2. You will still be connecting the led and resistor in series to one of the output pins. Go through the code and figure out which pin this is.
3. Upload the code and see the LED fading in and out.
4. Do the following modifications:
   (a) Change the speed of fade in and fade out by changing step size and by changing delay.

4 Analog input and serial communication

1. Open files→examples→analog→AnalogInOutSerial
2. This program will read analog input (figure out from which pin), adjust the led intensity accordingly, and write the input value to the serial port. The data at the serial port will then be converted into usb protocol data which will be received by your computer.
3. You can display the data received by the computer by clicking the magnifying glass like icon on the top right of the software IDE. Make sure the baud rate in the serial receiver matches the baud rate set in the program.
4. Experiment around with the code.