Arduino-project 002 – Pulsating LED

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A blinking **LED** is perhaps not the most exciting thing in the world, but if you can get it to pulsate instead it would be a little more interesting. Build the circuit from **project 001**, but use the code below instead. Here we use a **for-loop** to gradually increase the intensity of the **LED** and when we've reached the maximum we use a new loop to lower the intensity again.

Analogue values in a digital world.

Earlier we used `digitalWrite()` to activate the **LED**, but with that function we can only set anoutput to either 0 volts or the full voltage of the power supply, i.e. 5 volts. In order to set the light intensity instead we use `analogWrite()` which makes it possible to set an output to what appears to be any voltage between 0 and 5 volts in 256 steps. It is however important to note that the an **Arduino board** really can't give out anything other than digital signals, i.e. 0 or 5 volts, but by switching very fast between 0 and 5 volts it looks as if the voltage is somewhere in between. This is called PWM – Pulse Width Modulation. For this project with our **LED**it doesn't matter that the output pulses because the switching is too fast for our eyes to see and the same is true if we want to control a **motor** – the pulses are too fast for the motor to vibrate and it will instead just run at a speed proportional to the pulses. There are however times when this won't work so it is important to verify that whatever you connect to your **Arduino board** can actually handle PWM-signals or if it requires a genuine analogue signal. To create proper analogue signals a special circuit or module is required which logically is called a **Digital to Analog Converter** or **DAC** for short.