4CCS1CS1 Computer Systems

Assembling Nano Programs on Your Own Computer

1 Getting the toolchain

We have been using the gcc-avr assembly toolchain. This guide will point you to resources for downloading and installing the toolchain on your own system (whether Windows, Mac OS, or Linux).

1.1 Windows

For Windows you should install the WinAVR tool kit (`http://sourceforge.net/projects/winavr/`). Here is a step-by-step setup (`http://www.ladyada.net/learn/avr/setup-win.html`).

1.2 Mac OS

On the Mac there is a short way and long way.

The short way involves installing Homebrew first (`http://brew.sh`) and then using brew installing the gcc-avr tools. Follow the set-up here (`https://github.com/osx-cross/homebrew-avr`).

The long way involves downloading all of the tools separately, compiling and installing them. Here is a step-by-step set-up (`http://www.ladyada.net/learn/avr/setup-mac.html`).

There is also CrossPack, which might be a even faster set-up for OS X (`https://www.obdev.at/products/crosspack/index.html`).

1.3 Linux

First, install the gcc compiler. If installed successfully, the second command will verify the version of the compiler that has been installed.

```
sudo apt-get install gcc build-essential
gcc --version
```

Next, install the avr toolchain.

```
sudo apt-get install gcc-avr avr-libc
```

And finally, install avrdude for uploading programs to the Arduino Nano.

```
sudo apt-get install avrdude
```

2 Using Avrdude

If you do attempt to use avrdude to download your Nano programs to your Nano, be aware that specifying the USB communication port on OS's differ.

Here is the avrdude command that we use in the Informatics lab (it's one long command written across two lines, but can be written as a single line by removing the backslash):

```
avrdude -C /etc/avrdude/avrdude.conf -p atmega328p -c arduino -P /dev/ttyUSB0 \
-b 57600 -D -U flash:w:clr_sreg.hex:i
```

2.1 Location of the avrdude.conf configuration file

You will have to find where the `avrdude.conf` file is located on your system, and specify a path to it. For example, on other Unix machines it may be at `/etc/avrdude.conf`; using the command `whereis avrdude` should return the correct file path. On Window machines installed with the WinAVR package, it is usually not required to specify the config file (i.e. `-C /etc/avrdude.conf` part of the command).

2.2 Specify the Device or COM port

On Unix computers, the device that the Arduino shows up as is most likely `/dev/ttyUSB0`. On a Windows machine, you will specify a COM as `com3` or `com1`. You will have to plug in the Arduino and look in the System Device Manager to find out which COM port the Arduino shows up as.

Post your problems on the CS1 KEATS Forum — others may have solved a problem that you have been having!