Introduction

This document describes the system requirements of development machines to be used by CSCE317in 2020. This document is intended for systems administrators configuring lab machines, as well as for instructors, TAs, or students who which to be able to work on course projects outside of the university-provided labs. Students using the university's labs and equipment do not need to read this document.

Contents

1 Operating System

This course is designed to be done on UNIX-like systems. Most course development has been done on Ubuntu Linux, but other UNIX-like systems should work.

2 Software

The following software must be available for students to use. **No specific version constraints are known at this time**, but known-working version numbers are included in parenthesis where available.

- avrdude[1] (6.2)
- avr-gcc[2] (4.9.2)
- avr-binutils[3] (2.25)
- picocom[4] (3.1)
- GNU make[5] (4.1)
- GNU tar[6] (1.29)
- GNU Bash[7] (4.3.48)

All such tools need to be made available via the `PATH` that students will use for their user account.

Further, the following software is not strictly required but is referenced by the course material, and is highly recommended to be made available to students:

- vim[8] (8.2)
- emacs[9]
- Visual Studio Code[10]
- git[11] (2.14.5)

In addition, students will need access to standard desktop productivity software, including a web browser and PDF viewer.

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[1] http://www.nongnu.org/avrdude/
[2] https://www.gnu.org/software/gcc/
[3] https://www.gnu.org/software/binutils/
[4] https://github.com/npat-efault/picocom
[5] https://www.gnu.org/software/make/
[6] https://www.gnu.org/software/tar/
[7] https://www.gnu.org/software/bash/
[8] https://www.vim.org/
[9] https://www.gnu.org/software/emacs/
[10] https://code.visualstudio.com/
[11] https://git-scm.com/

3   Hardware Access

Because the students will be interfacing directly with hardware devices, they will need to have access to workstation computers with exposed USB ports. Further, they will need the ability to directly attach a userland program to the in-circuit programmer, as well as the ability to attach to USB-to-serial devices.

To ensure that console access can be obtained, it is suggested to add the students user accounts to the `dialout` group, or the equivalent for your operating system or Linux distribution.

To ensure proper access to in-circuit programming devices, it is suggested to add the following udev rules to `/etc/udev/rules.d/`. Note that these rules assume that the users two whom they will apply are in the `dialout` group - you may need to adjust for your system and site configurations.

3.1   `52-avrice.rules` (Atmel AVRICE programmers)

```
SUBSYSTEM=="usb", ATTR{idProduct}=="2141", ATTRS{idVendor}=="03eb", MODE="0660", GROUP="dialout"
```

Listing 1: udev rule for AVRICE programmer

3.2   `51-usbtiny.rules` (USBTinyISP and compatible programmers)

```
SUBSYSTEM=="usb", ATTR{product}=="USBtiny", ATTR{idProduct}=="0c9f", ATTRS{idVendor}=="1781", MODE
    ="0660", GROUP="dialout"
```

Listing 2: udev rule for USBTinyISP and compatible programmers