

EDE - ELB816 Development Environment

Project Aims:

This project aims to develop:

- An assembler for ELB816¹ assembly language.
- An emulated programmable microcontroller based on the ELB816 architecture.
- A debugger that allows interactive debugging of programs running on the emulator

Motivations:

The ELB816 architecture is designed to be a "... simple to understand 8-bit microprocessor system to help people learn about microprocessor electronics."

The combination of an ELB816 emulator, debugger and assembler could be used as a set of tools for learning or teaching microcontroller programming without the intricacies of real-world commercial microcontrollers getting in the way of fundamental understanding of the subject.

A PC based emulator would allow students to quickly develop and debug a simple assembly language on any modern desktop or laptop and an MCS-51 port running on an 8052 would allow students to test programs in an actual circuit.

Methodology:

Assembler

The assembler will be written in Python. It will be developed before anything else so that it can subsequently be used to assemble test programs during development of the emulator.

It will assemble the language described in the ELB816 specification.²

Emulator

The emulator will be written using only standard libraries in order to ensure it is portable between compilers and platforms, specifically GCC for x86 and SDCC for Intel MCS-51. Its behaviour will be based on the ELB816 specification.

The emulator will first be developed on Linux to facilitate rapid development. It will be ported to MCS-51 once it is complete.

Debugger

The debugger interface will be written in Python and will have the ability to debug programs running in the emulator on a PC or a microcontroller.

It will be developed alongside the emulator and used to test the emulator during development.

Project Mile Stones:

- 1** Complete assembler
- 2** Complete Linux build of emulator.
- 3** Complete MCS-51 build of emulator.
- 4** Complete debugger.
- 5** Complete project report.

Refer to project time line for start and completion date of each activity.³

References:

¹ <http://code.google.com/p/elb816/>

² <http://code.google.com/p/elb816/downloads/detail?name=specification.pdf>

³ <https://code.soundsoftware.ac.uk/attachments/download/848/timeline.html>