Using LISP on Sun SPARCstations and IBM RS/6000s

The department has Sun SPARCstations in the basement of Painter Hall and across from TAY 2.144, and IBM RS/6000s in TAY 2.144. Allegro Lisp and Gnu Common Lisp (GCL) are available on both. Allegro is in `/lusr/lang/franz/acl4.2/bin/cl`. It is commercial, newer, and has a nice interface for emacs. GCL is `/p/bin/xgcl`; it includes interactive interfaces to X windows.

Starting X Windows. On the older Sun SPARCstations in PAI, after you login, start the X windows system by typing `openwin` or `xstart`. The newer Suns and IBM X terminals always run X windows.

Running Lisp. It is useful to have a close connection between Lisp and your editor. This may be achieved in several ways.

1. Run your editor in an xterm window and any Lisp in another xterm window. You can now use xterm's cut and paste mouse functions to cut and paste between the editor and Lisp. Simple but somewhat slow.

2. Run emacs with Lisp as a subprocess. The Lisp input and output will appear in its own buffer. This is described below.

Emacs

Emacs is the preferred editor for use with Lisp because Lisp can run as a subprocess of Emacs; this reduces the amount of typing required. Start Emacs by entering `emacs &` .

Unless you already have such files, you may wish to copy the files `/u/cs381k/.lisp.el` and `/u/cs381k/.emacs` to your directory. These set up links between Lisp and Emacs.

GCL Lisp

GCL (Gnu Common Lisp) was originally written at the University of Kyoto, with compiler improvements by Prof. William Schelter at UT. It has all of the basic Common Lisp functions, but not CLOS; it has an interface to X windows, written by Hiep Huu Nguyen and Gordon Novak.

The Emacs window can be enlarged to make room for two half-windows; then it is possible to run Lisp in one half while examining and editing code in the other half. Entering `C-x 3` will split the Emacs window vertically; entering `C-x 2` will split the window horizontally. To run Lisp, click the left mouse button in one half window to put the cursor in that half, then give the command `M-x run lisp` .

When running Lisp, enter one or more lines following the prompt character `>` , followed by `Return`. A one-line expression can be executed again simply by placing the cursor at the end of the line and entering Return. In Lisp Mode (if the file name ends in `.lsp` or the command `M-x lisp-mode` is entered), the Tab key may be used to space over so that the indentation matches the previous expression at the same parenthesis nesting level. This makes code easier to read and helps prevent parenthesis errors.

To edit text in Emacs, click the left mouse button in the text half-window to select that half; then use `C-x C-v` to visit the desired program text file. It is convenient to have two half-windows because program development and testing can be alternated; text can be "killed" in one half and "yanked" back in the other half. It is possible to read a `defun` or other form from the text into Lisp by putting the cursor on the desired text and giving the command `C-M-z` (control-meta-z: hold down both Ctrl and Meta while typing z). Remember to use `C-x C-s` periodically to save your code file.

An infinite loop in Lisp can be interrupted by entering `C-c` twice. Files can be loaded with commands of the form: `(load "/u/username/myfile.lsp")` where "`username`" is your user name. `(bye)` will exit from Lisp. `(help)` provides on-line help. In case of a Lisp error break, you can enter `:q` to abort back to the Lisp interpreter, or `:b` for a backtrace of function calls. `:h` provides help about other break options.

Documentation of the X interface can be examined by entering `xdvi /u/cs381k/dwdoc` to Unix. Examples are in `/u/cs381k/dwtest.lsp` .

Allegro Common Lisp

Allegro Common Lisp is a product of Franz, Inc. If you want to run Allegro, copy the file `/u/cs381k/.emacs` to your directory and add the following line to your `.login` file:

```
setenv PATH /lusr/lang/franz/acl4.2/bin:{$PATH}
```

Start emacs with `emacs &` at the Unix prompt. In emacs, type `M-x fi:common-lisp` and Allegro will start running in a new buffer. You will first be prompted for a few things; in most cases the default (i.e., hitting return) will work. The only thing to watch out for is the process directory prompt – you need to make sure you are in the directory you're interested in, i.e., the directory where your own Lisp files will be kept. This arrangement will give you emacs pull-down menus for several functions linking the lisp process with buffers containing lisp program files. The Common LISP manual option on the menus may not currently work.

Dial-In Access

Dialin access to CS machines is through the Computation Center's Telesys system. It is necessary to have a Telesys account (for which you must pay 8 cents per day).

References:

1. Steele, Guy L. Jr., *Common Lisp: the Language*, Digital Press.

2. Stallman, Richard, *GNU Emacs Manual*. (Available upstairs at the Co-op.)