

CS-731 Lecture 14

March 20, 2001

Administrivia

- Assignment 3 is due by midnight March 22.
 - Late penalty of 1% per day until March 29; after that the project will not be accepted and you will get a grade of zero for the assignment.
- There will be a midterm exam on 4/3.
- Assignment 4 will be due 4/5.

My Makefile - 1

```
# $Id: Makefile,v 2.1 2001/03/18 05:22:33 vickery Exp $

# Makefile for the qsh project
#
# $Log: Makefile,v $
# Revision 2.1 2001/03/18 05:22:33 vickery
# No change from version 1.4.
#
# Revision 1.4 2001/03/15 22:57:37 vickery
# Added depend rule and added header file dependencies
# using it. Added removal of read-only versions of source
# and header files, as well as Makefile.
#
# Revision 1.3 2001/03/15 19:15:26 vickery
# Changed name of sh_exit.cc to sh_builtins.cc.
# Added "depend" target and added SRCS rule, with OBJS derived
# from it, for use in the makedepend command.
```

My Makefile - 2

```
HDRS= sh_builtins.h
SRCS= main.cc sh_builtins.cc
OBJS= $(SRCS:.cc=.o)

qsh : $(OBJS)
    $(CXX) $(LDFLAGS) $(OBJS) -o $@

depend: $(SRCS) $(HDRS)
    makedepend -- $(CFLAGS) -- -Y $(SRCS) >/dev/null 2>&1

clean:
    rm -f *.o qsh *.bak
    @for f in $(SRCS) $(HDRS) Makefile; \
do \
    if [[ -r $$f && -w $$f ]]; then echo "$$f is locked"; fi; \
    if [[ -r $$f && ! -w $$f ]]; then echo "rm -f $$f"; rm -f $$f; fi; \
done

# DO NOT DELETE

main.o: sh_builtins.h
sh_builtins.o: sh_builtins.h
```

Makefile Notes

- Form of log file messages.
- Introduced HDRS variable.
- Command for *qsh* target is linker-only.
 - No need for CFLAGS or CXXFLAGS
 - Note use of CXX, which must be defined in the user's environment.
- The *depend* rule depends on the sources and header files being present in the directory.
 - Note use of “-- \$(CFLAGS) --”
- The *clean* rule uses a shell script to remove read-only versions of source header files, and to issue messages for writeable (locked) versions.
 - Script is executed by Bourne shell (*sh*).
 - Use “@” to suppress printing of the command.
 - Uses ‘;’ to separate commands and ‘\’ to continue across lines.

Compiler Driver Options

- Preprocessor Options
 - Dxxx[=yyy] Define preprocessor variable xxx.
 - Ixxx Search directory xxx for header files.
- Compiler Options
 - g Keep symbol table in object module for use by debugger.
 - Wall Display all warnings for questionable coding practices.
- Linker Options
 - lxxx Search library libxxx for needed modules.
 - Lxxx Search directory xxx for libraries.