

# GNU Make Short Reference

## Rules:

target: pre-1 pre-2 ... pre-n  
TAB command

## Implicit Rules

pattern	rule
t.o: t.c	\$(CC) -c \$(CPPFLAGS) \$(CFLAGS)
t.o: t.cc	\$(CXX) -c \$(CPPFLAGS) \$(CXXFLAGS)
t.o: t.f	\$(FC) -c \$(FFLAGS)
t.o: t.F	\$(FC) -c \$(FFLAGS) \$(CPPFLAGS)
t.o: t.s	\$(AS) \$(ASFLAGS)
t: t.o	\$(CC) \$(LDFLAGS) t.o \$(LOADLIBES) \$(LDLIBS)
t.c: t.y	\$(YACC) \$(YFLAGS)
t.c: t.l	\$(LEX) \$(LFLAGS)
t.ln: t.c	\$(LINT) \$(LINTFLAGS) \$(CPPFLAGS) -i
t.dvi: t.tex	\$(TEX)

## Logical Names

name	meaning	default on Linux
AR	archive-maintaining program	ar
AS	Assembler	as
ASFLAGS	Assembler flags	
CC	C compiler	cc
CFLAGS	C compiler flags	
CPP	C preprocessor	\$(CC) -E
CPPFLAGS	C preprocessor flags	
CXX	C++ compiler	c++
CXXFLAGS	C++ compiler flags	
FC	Fortran77 compiler	f77
FFLAGS	Fortran77 compiler flags	
LD	Linker	ld
LDFLAGS	Linker flags	
LDLIBS	load libraries	
LEX	Lex scanner generator	flex
LFLAGS	Lex flags	
LINT	Lint static C program checker	lint
LINTFLAGS	Lint flags (lint)	
LOADLIBES	load libraries	
MAKE	make command	make
RM	remove file	rm -f
TEX	TeX document system	latex
YACC	Yacc compiler generator	bison
YFLAGS	Yacc flags	

## Special Targets

name	meaning	example
.PHONY	target that is not a name of a file	.PHONY: clean
.SUFFIXES	list of names for suffix rules	.SUFFIXES .c .o
.DEFAULT	command executed if no other rules applies	.DEFAULT cat
.PRECIOUS	these targets are not deleted if make is interrupted	
.INTERMEDIATE	files listed are treated as intermediate files	.INTERMEDIATE .o
.SECONDARY	files listed are treated as intermediate files	.SECONDARY .o
.IGNORE		
.SILENT	command executed are not printed out	.SILENT .o

## Variables

meaning	example
setting a variable (evaluated each time)	CPP = \$(CC) -E
setting a variable (evaluated once)	CPP := \$(CC) -E
value of a variable	\$(CC)

## Automatic Variables

name	meaning
.\$@	target
.\$%	target member if target is an archive
.\$<	pre1
.\$?	all pre-x that are newer than target
.\$^	all pre-x (without duplicates)
.\$+	all pre-x (with duplicates preserved)
.\$*	stem with which rule matches