

1

가

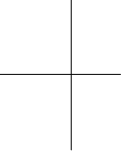
, GNU

, GNU

가 ,

GNU

가



: " " ,
가
: 가
가 가 가
가
가 : 가
dbm
(filter):
가
:
,
ct ags (cross-reference
system) (regular
expression)
:
가
가 가
가 가
?
가 가 ()
가 ,



Andy Tanenbaum Minix
가
CPU
x86 PC Sun Sparc
, IBM PowerPC, Itanium ,
PDA Playstation2 가 가 가가

GNU Foundation)

(Free Software

가
가 가 가
GNU
(General Public License)
가
, GNU GNU Emacs
(GNU GNU's Not Unix)
. GNU
. GNU
GNU
GNU
(General Public License, GPL) , <http://www.gnu.org>

(copyleft; copyright)
가 가 .

GPL GNU 가 .

GCC: GNU (Compiler Collection), GNU C .

G++: C++ , GCC .

GDB:

GNU make: make

Bison: yacc (parser)

bash:

GNU Emacs:

가 가 GPL .

Gimp , , 가 (GNOME KDE) . GNOME

KDE 16 17 .

가 가 가 , GNU . GNU

GNU/ .

ht t p ://www.gnu .or g .

, 가 ,

GNU .

(distribution, (flavor)
) CD-ROM .

가) 가 (Red Hat) , 가 (SuSE) , (Debian) GNU/ X

C C 가 C C 가

1969 PDP 7 (Dennis Ritchie) C , 1973 가 (Ken Thompson) , C C

, CD-ROM 가 FTP (archive)

Ada	C	C++
Eiffel	Forth	Fortran
Icon	Java	JavaScript
Lisp	Modula 2	Modula 3
Oberon	Objective C	Pascal
Perl	PostScript	Prolog
Python	Scheme	Smalltalk
SQL	Tcl/Tk	Bourne Shell

(bash) C C C 2 가

가
 .bat .cmd
 (interprete)
 (BASIC)
 , Windows .exe
 Windows
 가
 . 2
 ()
 (bash)
 Windows
 ,
 PATH , Windows 가
 가
 /bin: ,
 /usr/bin: , 가
 /usr/local/bin: ,
 root PATH
 가 /sbin /usr/sbin
 /opt PATH 가
 PATH
 () PATH MS-DOS
 Windows () (가 : 가
 Windows가 !). PATH 가

```
/usr/local/bin:/bin:/usr/bin:::/home/neil/bin:/usr/X11R6/bin
```

PATH, (.), X

(\), (/), Windows

C

POSIX C c89 C cc

. C 가 cc 가 .

POSIX , cc 가 가

. C , c89 .

. C C c89, cc, gcc GNU C gcc

. C cc .

gcc 가 gcc , gcc가 C ANSI gcc가 gcc

ht tp://www.gnu.org gcc

▾ - C

C . 가 “Hello World”가 .

1. hello.c 가 .


```
#include <stdio.h>

int main()
{
    printf("Hello World\n");
    exit(0);
}
```

```
가 . vi , emacs
    가 . emacs
    . emacs Ctrl+H t
    . emacs 가 . emacs Ctrl+H i
    . emacs 가 .
```

2.

```
$ gcc -o hello hello.c
$ ./hello
Hello World
$
```



GNU C (cc) C
hello 가 ,
. 가 ,
. C
가 . 가 (Software
Development) 가 ,
가 . hello
. PATH가 ,
hello . 가 PATH 가 hello
. PATH hello
가 .

```

, ./ ( ./hello).
가
-o a.out (assembler output) 가
가 a.out 가
가 a.out
a.out
가
가
가
/usr/bin 가
가 /usr/local/bin /opt
/usr/local 가
, 가 ./usr
./usr/local ./usr/lo
cal
가 가
X /usr/X11
(Revision) 6 /usr/X11R6 , XFree 가
XFree86
. Sun 가 /usr/openwin
GNU gcc( )
/usr/bin /usr/local/bin
,
/usr/lib/gcc-lib/

```

```

i486-suse-linux/3.3/ . GNU C/C++ /usr/lib/gcc-lib/
GNU

```

```

C , /usr/include
.C

```

```

/usr/include/sys /usr/include/linux

```

```

가 . 가
X /usr/include/X11 GNU C++
/usr/include/g++

```

```

가 C -I

```

```

$ gcc -I/usr/openwin/include fred.c

```

```

/usr/openwin/include . fred.c
.C

```

```

(man gcc)

```

```

grep #define 가
/usr/include , grep

```

```

$ grep EXIT_ *.h

```

```

...
stdlib.h:#define EXIT_FAILURE 1 /* Failing exit status. */
stdlib.h:#define EXIT_SUCCESS 0 /* Successful exit status. */
...
$

```

```

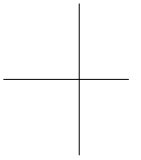
grep .h EXIT_
stdlib.h

```

```

(curses ncurses ), (dbm )
가
/lib /usr/lib .C (
) CPU 가 C
가
(command line)
lib
(C c, m).
(static library) .a
(shared library) .so( )
ls /usr/lib
-l
$ gcc -o fred fred.c /usr/lib/libm.a
fred.c fred
C
$ gcc -o fred fred.c -lm
-lm( m ) ( /usr/lib)
libm.a ( 가 가 ).
-lm 가 가 가

```



, -L

가 . ,

\$ gcc -o x11fred -L/usr/openwin/lib x11fred.c -lX11

/usr/openwin/lib libX11 x11fred

가 가 .

. , 가 .
-l C 가

(archive) .a 가 C
/usr/lib/libc.a X11 /usr/X11/lib/libX11.a .

gcc -c ar(archive)
.가 .
가 ,

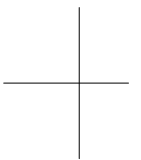


fred bill ,

1. (fred.c bill.c) .

```
#include <stdio.h>

void fred(int arg)
```



```
{
    printf("fred: you passed %d\n", arg);
}
```

```
#include <stdio.h>

void bill(char *arg)
{
    printf("bill: you passed %s\n", arg);
}
```

2. `gcc -c fred.c` (object file)

```
-c      C      .      가
      .      min
```

```
$ gcc -c bill.c fred.c
$ ls *.o
bill.o fred.o
```

3. `gcc bill.o fred.o`
`gcc . fred.c bill.c`
가

```
/*
    lib.h      fred bill
*/

void bill(char *);
void fred(int);
```

4. `gcc program.c`

```
#include "lib.h"

int main()
{
    bill("Hello World");
    exit(0);
}
```

5.

bill.o

```
$ gcc -c program.c
$ gcc -o program program.o bill.o
$ ./program
bill: you passed Hello World
$
```

6.

```
가 . ar
( ar 가 ).
```

```
$ ar crv libfoo.a bill.o fred.o
a - bill.o
a - fred.o
```

7.

```
가 .
,
.ranlib GNU
( ).
```

```
$ ranlib libfoo.a
```

```
가 . 가
```

```
$ gcc -o program program.o libfoo.a
$ ./program
bill: you passed Hello World
$
```

```

        -l
    , -L
    .

$ gcc -o program program.o -L. -lfoo

-L.
    libfoo.a( libfoo.so )
    .

    가 , 가
nm . program libfoo.a , fred bill
    , program bill
    가 가
    .

```

Windows

		Windows
	func.o	FUNC.OBJ
	lib.a	LIB.LIB
	program	PROGRAM.EXE

가 .
/usr/lib/libm.so .

, 가

가 가 . /usr/lib/libm.so
(/usr/lib/libm.so.N N
6) (symbolic link) ,

가

SuSe 8.2

() ld.so . ld-linux.so.2 ld-lsb.so.1
가 . 가 /etc/ld.so.conf
ldconfig (X X11
가 가).

ldd 가 .

\$ ldd program

libc.so.6 => /lib/libc.so.6 (0x4002a000)
/lib/ld-linux.so.2 => /lib/ld-linux.so.2 (0x40000000)

C (libc)가 (.so). 6 .
가 .

```
Windows (dynamic link library)
.so .DLL .sa .LIB
가
가
man 가
가
GNU info
.info emacs info
info .info /
info
GNU C
1.
$ man gcc
GCC(1) GNU GCC(1)
```

NAME

gcc - GNU project C and C++ compiler

SYNOPSIS

```
gcc [-c|-S|-E] [-std=standard]
    [-g] [-pg] [-Olevel]
    [-Wwarn...] [-pedantic]
    [-Idir...] [-Ldir...]
    [-Dmacro[=defn]...] [-Umacro]
    [-foption...] [-mmachine-option...]
    [-o outfile] infile...
```

Only the most useful options are listed here; see below for the remainder. g++ accepts mostly the same options as gcc.

DESCRIPTION

When we invoke GCC, it normally does preprocessing, compilation, assembly and linking. The "overall options" allow you to stop this process at an intermediate stage. For example, the -c option says not to run the linker. Then the output consists of object files output by the assembler.

Other options are passed on to one stage of processing. Some options control the preprocessor and others the compiler itself. Yet other options control the assembler and linker; most of these are not documented here, since we rarely need to use any of them.

...

```

      가
GNU C(   C++)
      (spacebar)      가 ( )
      가 q

```

2. GNU C info

\$ info gcc

File: gcc.info, Node: Top, Next: G++ and GCC, Up: (DIR)
Introduction

This manual documents how to use the GNU compilers, as well as their features and incompatibilities, and how to report bugs. It corresponds to GCC version 3.3. The internals of the GNU compilers, including how to port them to new targets and some information about how to write front ends for new languages, are documented in a separate manual.

*Note Introduction: (gccint)Top.

* Menu :

* G++ and GCC:: We can compile C or C++ Applications.

* Standards:: Language standards supported by GCC.

* Invoking GCC:: Command options supported by 'gcc'.

* C Implementation:: How GCC implements the ISO C specification.

* C Extensions:: GNU extensions to the C language family.

* C++ Extensions:: GNU extensions to the C++ language.

* Objective-C:: GNU Objective-C runtime features.

* Compatibility:: Binary Compatibility

--zz-Info: (gcc.info.gz)Top, 40 lines --Top-- Subfile: gcc.info-1.gz--*** Tags o

Welcome to Info version 4.5. Type ? for help, m for menu item.

GNU C

가

info

info

. Ctrl+H

info

가

. info

가

가

가

C

, Windows