



GCC是多种语言的编译器

GCC是自由的编译器

GCC是跨平台的编译器

GCC是流行的编译器

GNU project C and C++ Compiler

GNU Compiler Collection

```
//File: helloworld.c
#include <stdio.h>
int main()
{
    printf("Hello world! I'm from gcc.\n");
    return 0;
}
```

gcc -o helloworld helloworld.c

`gcc -o helloworld helloworld.c`

`gcc -O0 -o helloworld helloworld.c`

`gcc -O1 -o helloworld helloworld.c`

`gcc -O2 -o helloworld helloworld.c`

`gcc -O3 -o helloworld helloworld.c`

```
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:27 helloworld01.exe*  
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:26 helloworld02.exe*  
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:32 helloworld03.exe*
```

`gcc -o helloworld helloworld.c`

`gcc -g -o helloworldG helloworld.c`

```
-rwxr-xr-x  1 kaseihi  None 19827 Aug 10 17:28 helloworldG.exe*  
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:27 helloworld01.exe*  
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:26 helloworld02.exe*  
-rwxr-xr-x  1 kaseihi  None 17961 Aug 10 17:32 helloworld03.exe*
```

```
//File: hello2main.c
#include "hello2function.h"
int main()
{
    hello2function();
    return 0;
}
```

```
//File: hello2function.h
void hello2function();
```

```
//File: hello2function.c
#include <stdio.h>
void hello2function()
{
    printf("Say hello, gcc.\n");
}
```

`gcc -o hello2main hello2main.c`

/tmp/ccBRqjhP.o:hello2main.o: (.text+0x17): undefined reference to `_hello2function'
collect2: ld returned 1 exit status


```
gcc -o hello2 hello2main.c  
hello2function.c
```



```
./ [hello2main.c  
hello2function.c  
hello2function.h]
```

./ [hello2main.c
hello2function.c
inc { hello2function.h

**gcc -o hello2 hello2main.c
hello2function.c**

```
hello2main.c:1:28: error: hello2function.h: No such file or directory
```

```
gcc -I./inc -o hello2 hello2main.c  
hello2function.c
```

```
gcc -I/home/kaseihi/hello2/inc -o  
hello2 hello2main.c  
hello2function.c
```

```
gcc -I/usr/include/gsl -o hello2  
hello2main.c hello2function.c
```

```
gcc -o helloworld helloworld.c
```

```
gcc -E helloworld.c > helloworld_pp.c
```

```
//File: helloworld.c  
.....  
int __attribute__((__cdecl__)) printf (const char *, ...)  
__attribute__((__format__ (__printf__, 1, 2)));  
.....  
int main()  
{  
    printf("Hello world! I'm from gcc.\n");  
    return 0;  
}
```

预处理

gcc -o helloworld helloworld.c

gcc -S helloworld.c

```
LC0:
    .file      "helloworld.c"
    .def       __main; .scl      2;          .type      32;          .endef
    .section .rdata,"dr"
    .ascii "Hello world! I'm from gcc.\0"
    .text
    .globl _main
    .def       _main; .scl      2;          .type      32;          .endef
    _main:
        leal    4(%esp), %ecx
        andl    $-16, %esp
        pushl   -4(%ecx)
        pushl   %ebp
        movl    %esp, %ebp
        pushl   %ecx
        subl    $4, %esp
        call    __main
        movl    $LC0, (%esp)
        call    _puts
        movl    $0, %eax
        addl    $4, %esp
        popl    %ecx
        popl    %ebp
        leal    -4(%ecx), %esp
```

gcc -o helloworld helloworld.c

gcc -c helloworld.c

```
$ objdump.exe -t helloworld.o
```

```
helloworld.o:      file format pe-i386
```

```
SYMBOL TABLE:
```

```
[ 0](sec -2)(fl 0x00)(ty 0)(sc1 1)(nx 1) 0x00000000 helloworld.c
File
[ 2](sec 1)(fl 0x00)(ty 20)(sc1 2) (nx 0) 0x00000000 _main
[ 3](sec 1)(fl 0x00)(ty  0)(sc1 3) (nx 1) 0x00000000 .text
AUX scnlen 0x3a nreloc 4 nlnno 0
[ 5](sec 2)(fl 0x00)(ty  0)(sc1 3) (nx 1) 0x00000000 .data
AUX scnlen 0x0 nreloc 0 nlnno 0
[ 7](sec 3)(fl 0x00)(ty  0)(sc1 3) (nx 1) 0x00000000 .bss
AUX scnlen 0x0 nreloc 0 nlnno 0
[ 9](sec 4)(fl 0x00)(ty  0)(sc1 3) (nx 1) 0x00000000 .rdata
AUX scnlen 0x28 nreloc 0 nlnno 0
[11](sec 0)(fl 0x00)(ty 20)(sc1 2) (nx 1) 0x00000000 __main
AUX tagndx 0 ttlsiz 0x0 lnnos 0 next 0
[13](sec 0)(fl 0x00)(ty 20)(sc1 2) (nx 0) 0x00000000 _printf
```

gcc -o helloworld helloworld.c

gcc -o helloworld helloworld.o

链接

```
$ ldd helloworld
ntdll.dll => /cygdrive/c/WINDOWS/system32/ntdll.dll (0x7c920000)
kernel32.dll => /cygdrive/c/WINDOWS/system32/kernel32.dll (0x7c800000)
cygwin1.dll => /usr/bin/cygwin1.dll (0x61000000)
ADVAPI32.DLL => /cygdrive/c/WINDOWS/system32/ADVAPI32.DLL (0x77da0000)
RPCRT4.dll => /cygdrive/c/WINDOWS/system32/RPCRT4.dll (0x77e50000)
Secur32.dll => /cygdrive/c/WINDOWS/system32/Secur32.dll (0x77fc0000)
cyggcc_s-1.dll => /usr/bin/cyggcc_s-1.dll (0x67f00000)
```

预处理 → 汇编

↓
编译 ← 链接

Make