

作業一

GDB & AMP; SIMULATOR

課程名稱：嵌入式系統與實習

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前置作業須知

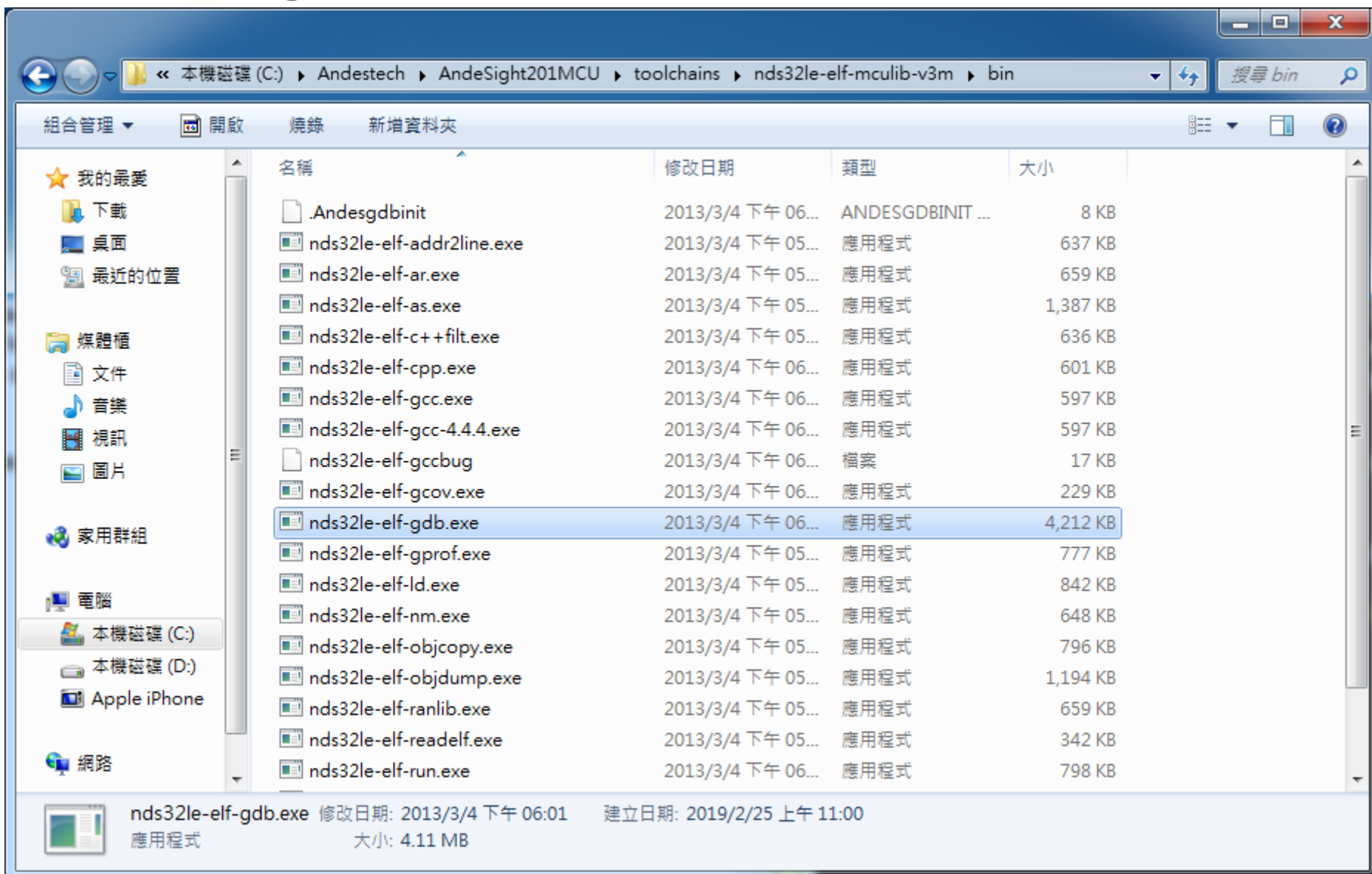
編譯執行檔

The screenshot shows a Windows File Explorer window with the address bar displaying the path: << 本機磁碟 (C:) > Andestech > AndeSight201MCU > toolchains > nds32le-elf-mculib-v3m > bin. The search bar contains the text "搜尋 bin". The left sidebar shows the navigation pane with "我的最愛" (Favorites) and "電腦" (This PC) sections. The main pane displays a list of files and folders in a table format.

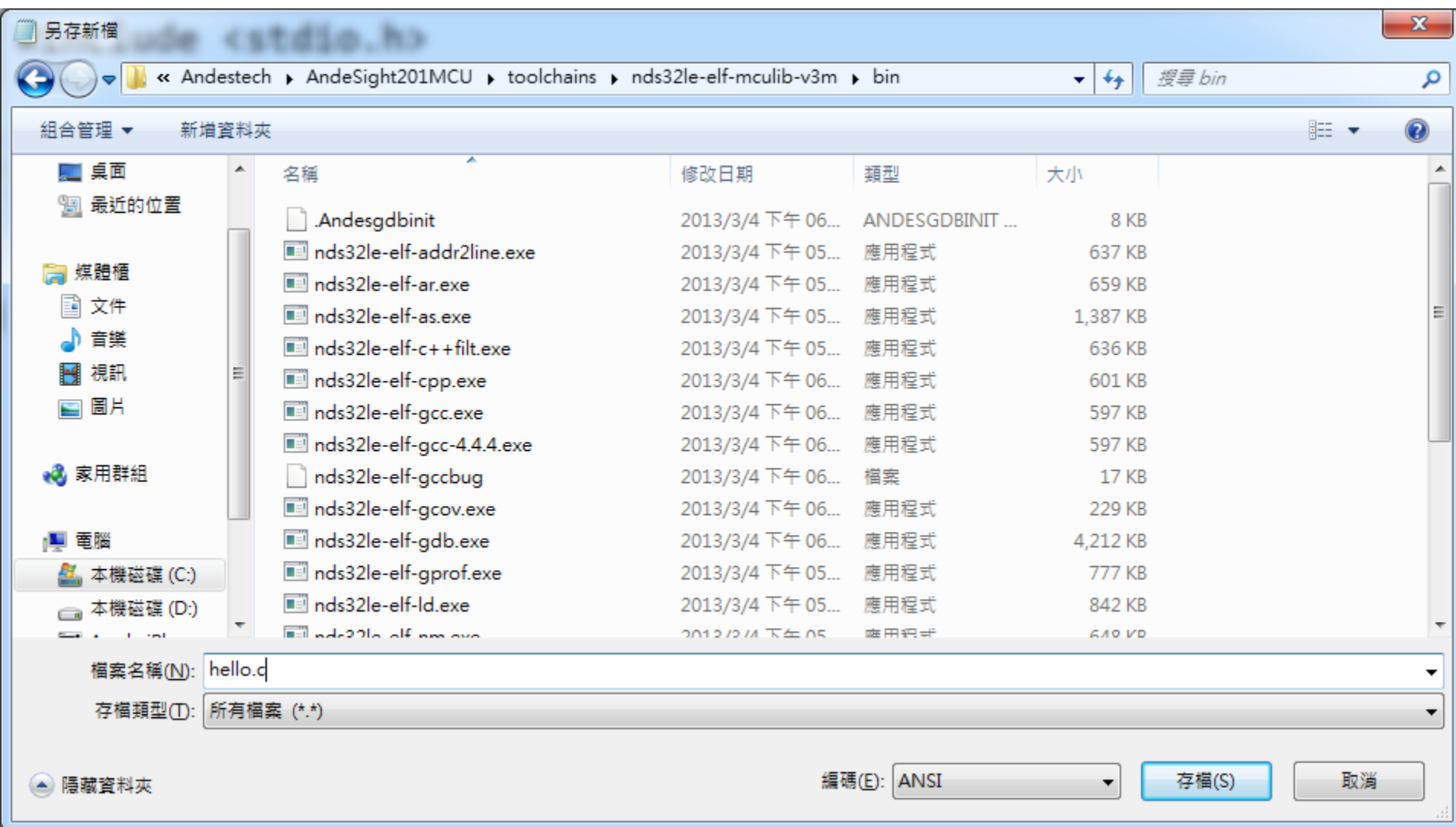
名稱	修改日期	類型	大小
.Andesgdbinit	2013/3/4 下午 06...	ANDESGDBINIT ...	8 KB
nds32le-elf-addr2line.exe	2013/3/4 下午 05...	應用程式	637 KB
nds32le-elf-ar.exe	2013/3/4 下午 05...	應用程式	659 KB
nds32le-elf-as.exe	2013/3/4 下午 05...	應用程式	1,387 KB
nds32le-elf-c++filt.exe	2013/3/4 下午 05...	應用程式	636 KB
nds32le-elf-cpp.exe	2013/3/4 下午 06...	應用程式	601 KB
nds32le-elf-gcc.exe	2013/3/4 下午 06...	應用程式	597 KB
nds32le-elf-gcc-4.4.4.exe	2013/3/4 下午 06...	應用程式	597 KB
nds32le-elf-gccbug	2013/3/4 下午 06...	檔案	17 KB
nds32le-elf-gcov.exe	2013/3/4 下午 06...	應用程式	229 KB
nds32le-elf-gdb.exe	2013/3/4 下午 06...	應用程式	4,212 KB
nds32le-elf-gprof.exe	2013/3/4 下午 05...	應用程式	777 KB
nds32le-elf-ld.exe	2013/3/4 下午 05...	應用程式	842 KB
nds32le-elf-nm.exe	2013/3/4 下午 05...	應用程式	648 KB
nds32le-elf-objcopy.exe	2013/3/4 下午 05...	應用程式	796 KB
nds32le-elf-objdump.exe	2013/3/4 下午 05...	應用程式	1,194 KB
nds32le-elf-ranlib.exe	2013/3/4 下午 05...	應用程式	659 KB
nds32le-elf-readelf.exe	2013/3/4 下午 05...	應用程式	342 KB
nds32le-elf-run.exe	2013/3/4 下午 06...	應用程式	798 KB

The status bar at the bottom shows details for the selected file, **nds32le-elf-gcc.exe**: 應用程式, 修改日期: 2013/3/4 下午 06:13, 建立日期: 2019/2/25 上午 11:00, 大小: 596 KB.

Debug

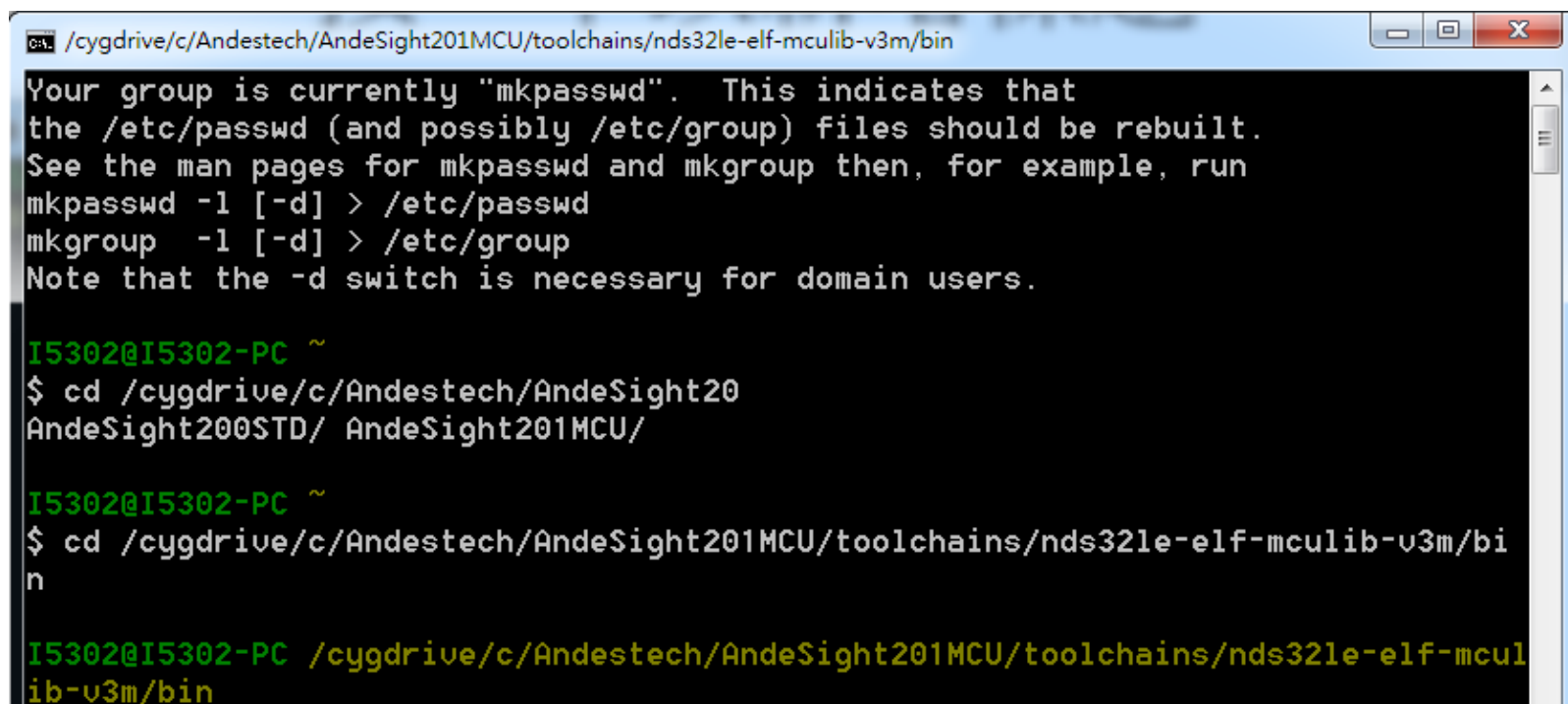


.C編譯連結位置



步驟開始

1. 切換到Andes目錄夾



```
C:\cygdrive\c\Andestech\AndeSight201MCU\toolchains\nds32le-elf-mculib-v3m\bin

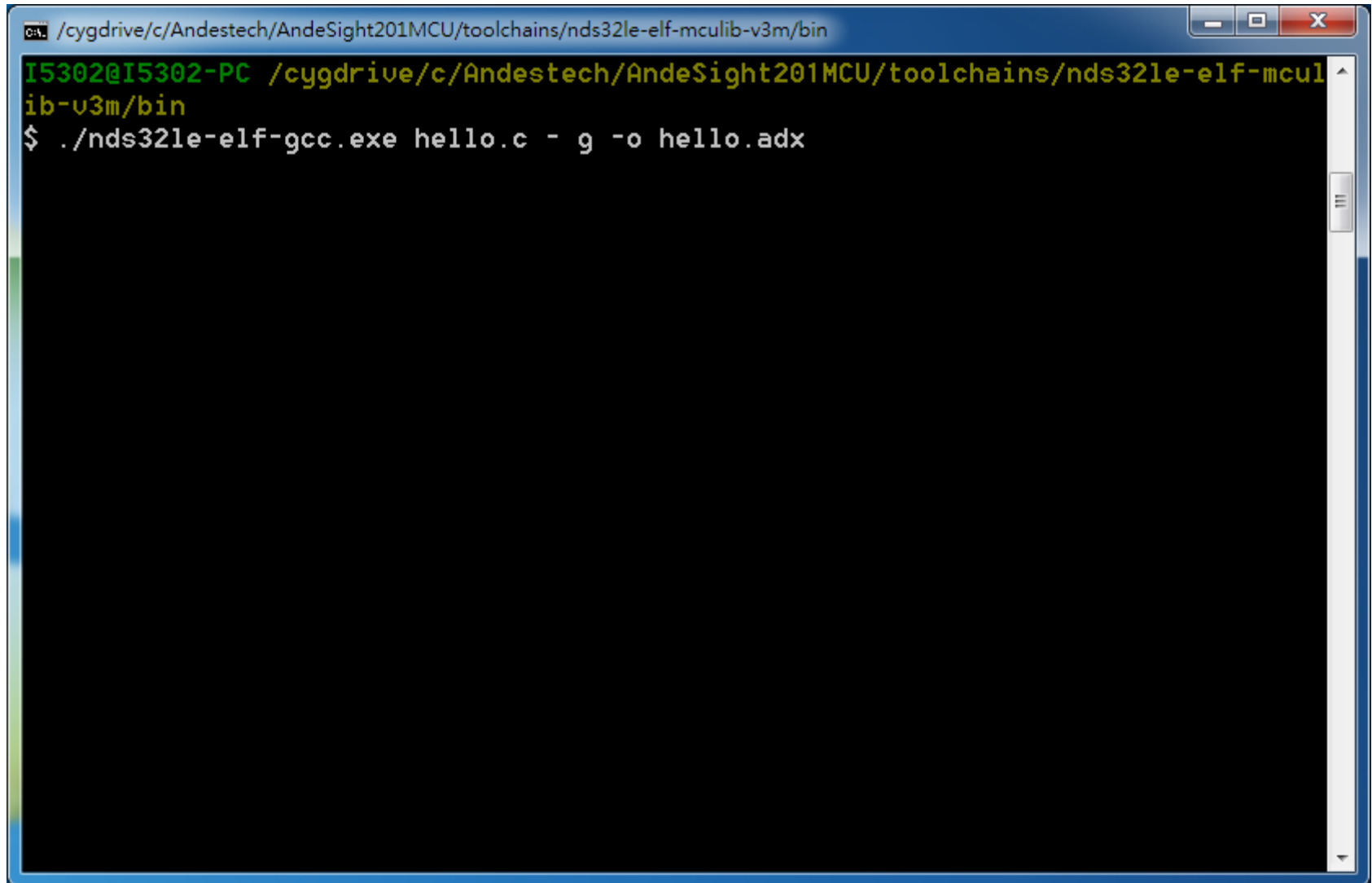
Your group is currently "mkpasswd". This indicates that
the /etc/passwd (and possibly /etc/group) files should be rebuilt.
See the man pages for mkpasswd and mkgroup then, for example, run
mkpasswd -l [-d] > /etc/passwd
mkgroup -l [-d] > /etc/group
Note that the -d switch is necessary for domain users.

I5302@I5302-PC ~
$ cd /cygdrive/c/Andestech/AndeSight20
AndeSight200STD/ AndeSight201MCU/

I5302@I5302-PC ~
$ cd /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bi
n

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
```

2.編譯hello.c檔

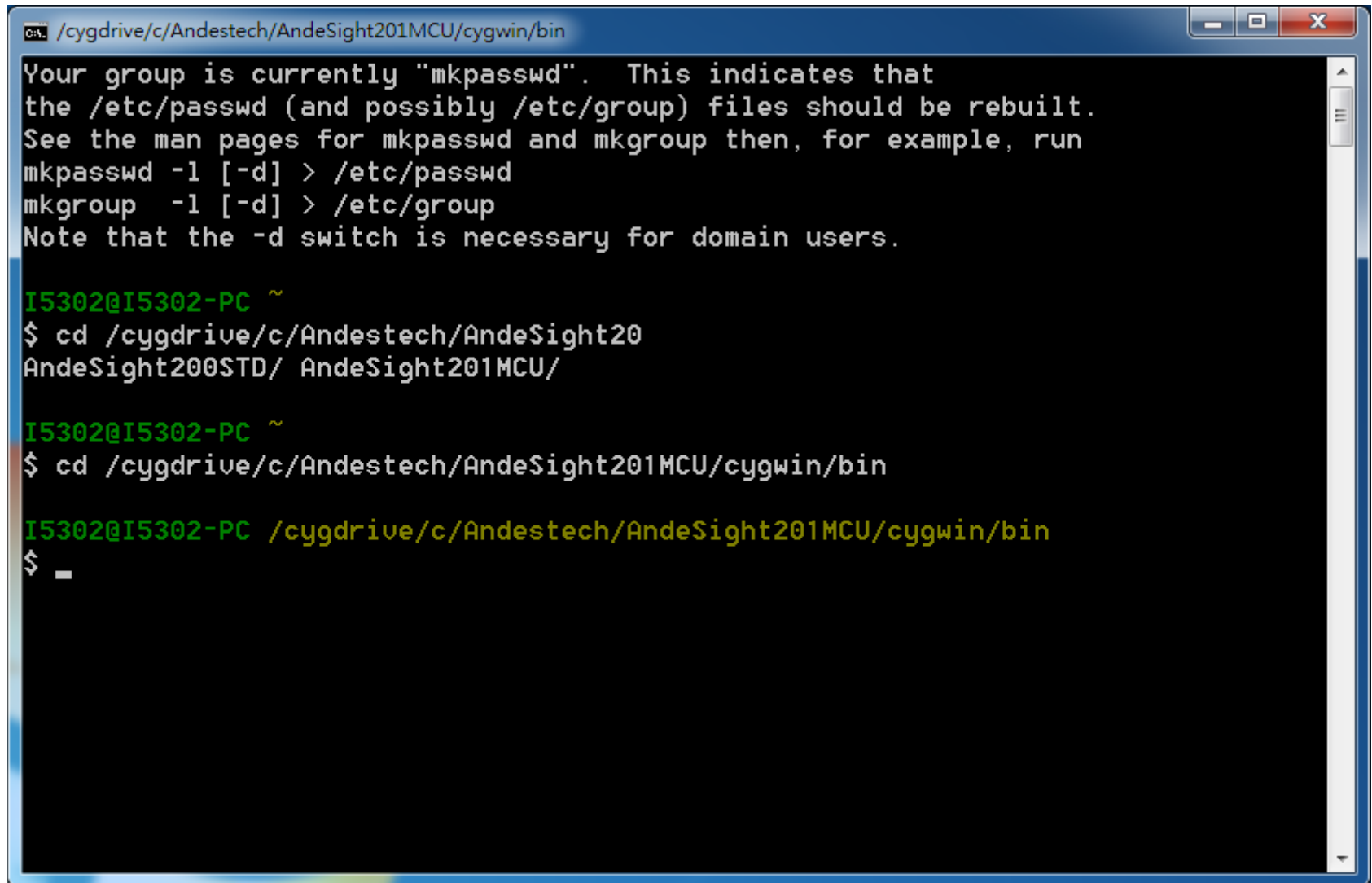


```
cmd /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
$ ./nds32le-elf-gcc.exe hello.c - g -o hello.adx
```


3.編譯後檢查.adx檔是否存在

```
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mcu1  
ib-v3m/bin  
$ ./nds32le-elf-gcc hello.c -g -o hello.adx  
  
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mcu1  
ib-v3m/bin  
$ ls hello.adx -l  
-rwxr-xr-x 1 I5302 mkpasswd 15685 Oct 13 10:12 hello.adx  
  
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mcu1  
ib-v3m/bin  
$
```

4. 切換到cygwin/bin資料夾



The screenshot shows a Cygwin terminal window with a blue title bar. The title bar text is `C:\ /cygdrive/c/Andestech/AndeSight201MCU/cygwin/bin`. The terminal content is as follows:

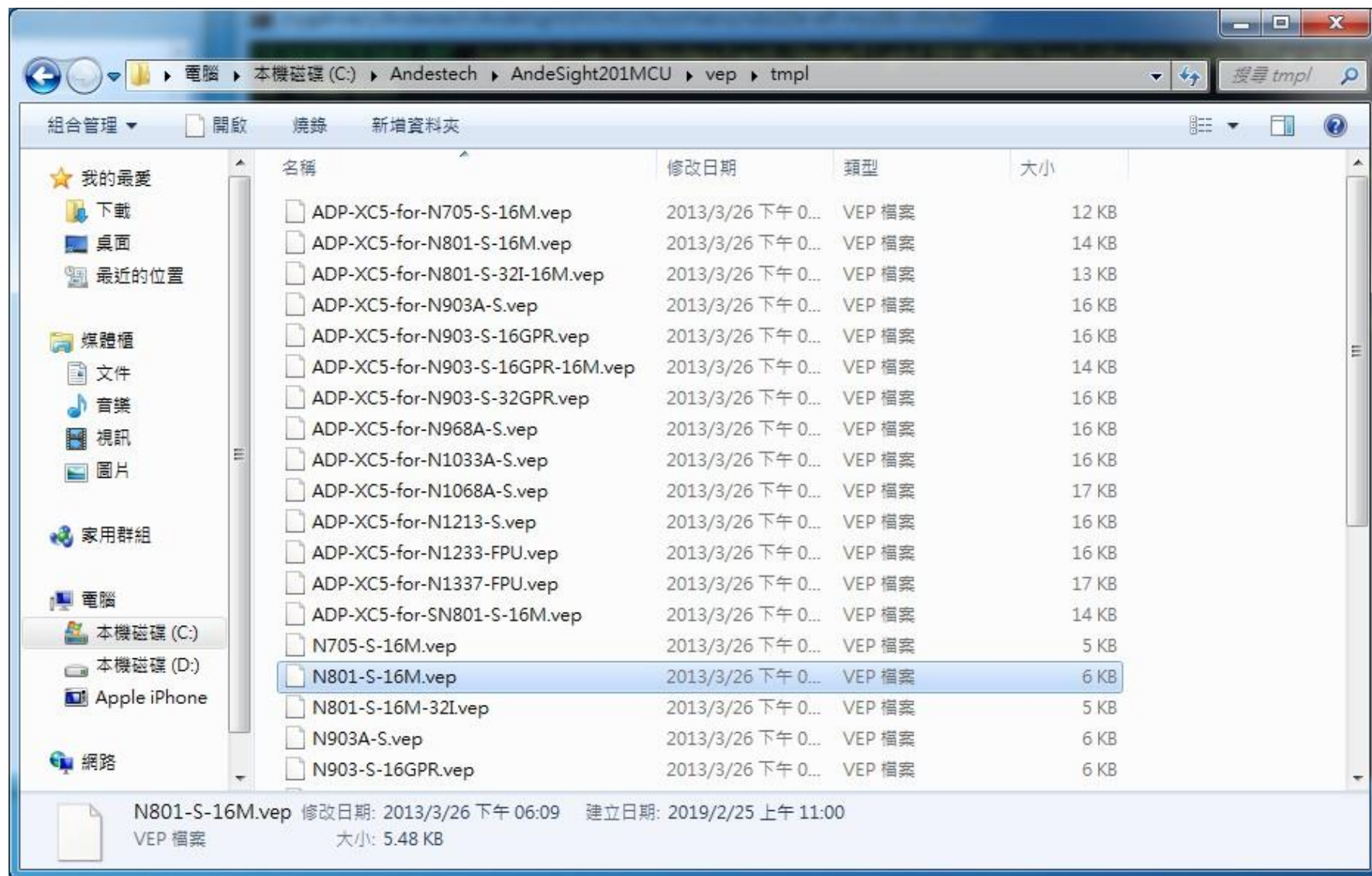
```
Your group is currently "mkpasswd". This indicates that
the /etc/passwd (and possibly /etc/group) files should be rebuilt.
See the man pages for mkpasswd and mkgroup then, for example, run
mkpasswd -l [-d] > /etc/passwd
mkgroup -l [-d] > /etc/group
Note that the -d switch is necessary for domain users.

I5302@I5302-PC ~
$ cd /cygdrive/c/Andestech/AndeSight20
AndeSight200STD/ AndeSight201MCU/

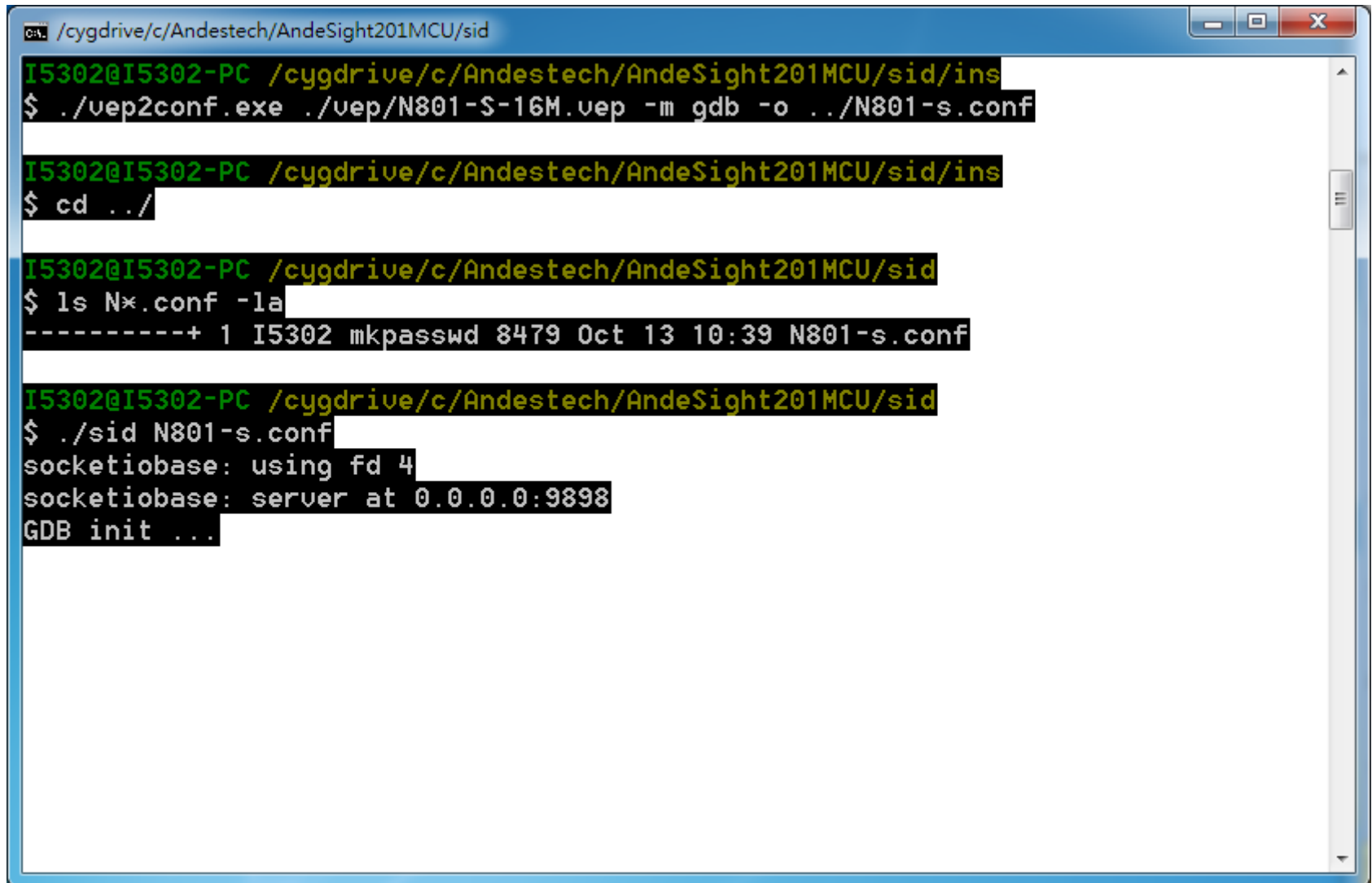
I5302@I5302-PC ~
$ cd /cygdrive/c/Andestech/AndeSight201MCU/cygwin/bin

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/cygwin/bin
$ _
```

(此.vep檔案需複製到/sid/ins裡)



6. 進入資料夾內編譯產生.conf檔



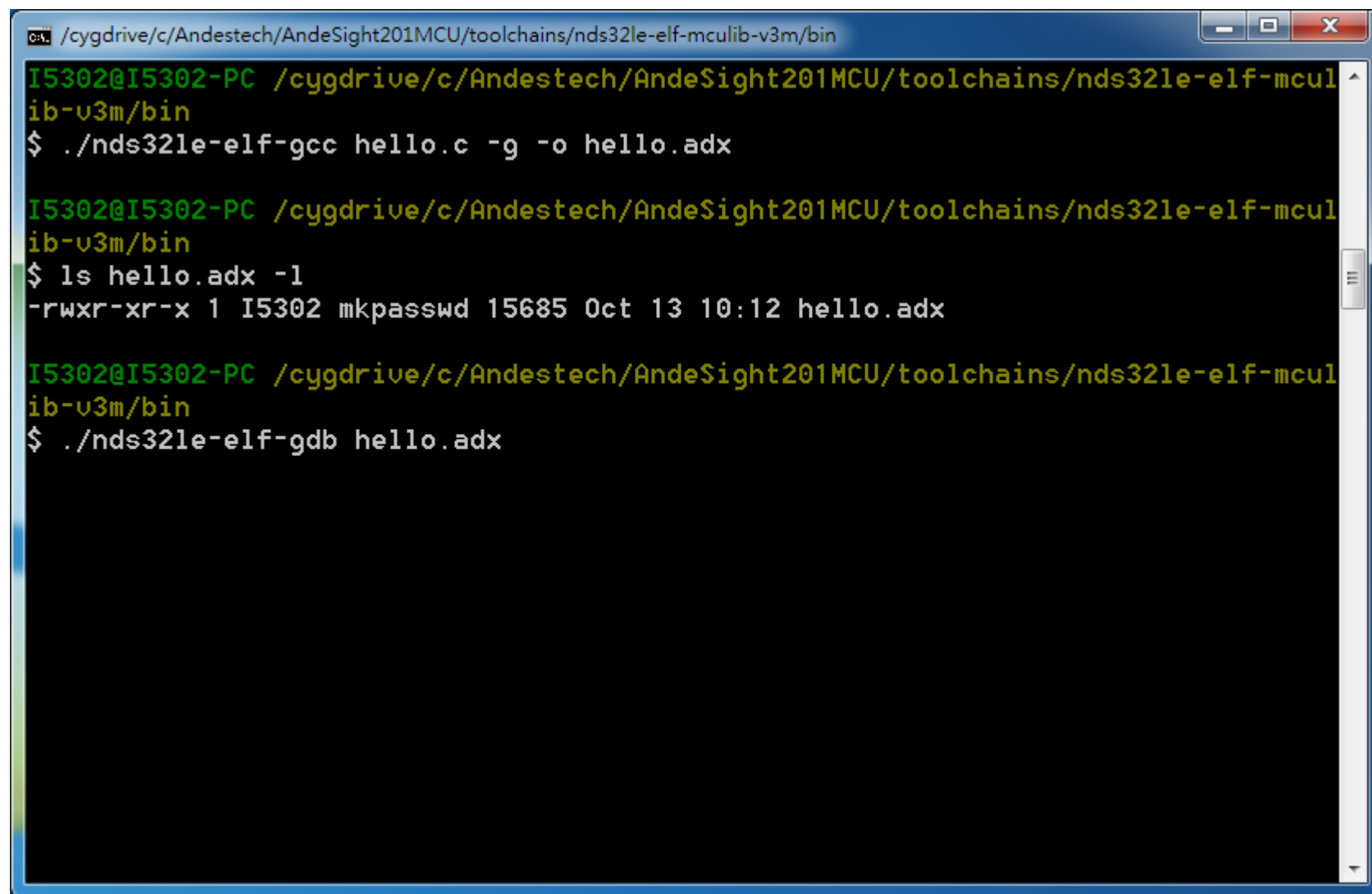
```
C:\ /cygdrive/c/Andestech/AndeSight201MCU/sid
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/sid/ins
$ ./vep2conf.exe ./vep/N801-S-16M.vep -m gdb -o ../N801-s.conf

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/sid/ins
$ cd ../

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/sid
$ ls N*.conf -la
-----+ 1 I5302 mkpasswd 8479 Oct 13 10:39 N801-s.conf

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/sid
$ ./sid N801-s.conf
socketiobase: using fd 4
socketiobase: server at 0.0.0.0:9898
GDB init ...
```

7.準備進入gdb環境中



```
ca /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
$ ./nds32le-elf-gcc hello.c -g -o hello.adx

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
$ ls hello.adx -l
-rwxr-xr-x 1 I5302 mkpasswd 15685 Oct 13 10:12 hello.adx

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
$ ./nds32le-elf-gdb hello.adx
```

8.連線與載入程式碼

```
ca /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
ib-v3m/bin
$ ls hello.adx -l
-rwxr-xr-x 1 I5302 mkpasswd 15685 Oct 13 10:12 hello.adx

I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
$ ./nds32le-elf-gdb hello.adx
GNU gdb (2013-03-04) 7.3
Copyright (C) 2011 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law. Type "show copying"
and "show warranty" for details.
This GDB was configured as "--host=i686-mingw32 --target=nds32le-elf".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
[info] Loading nds32-elf.gdbinit.
[info] nds32-elf.gdbinit loaded.
Reading symbols from c:\andestech\andesight201mcu\toolchains\nds32le-elf-mculib-v3m\bin\hello.adx...done.
(gdb) target remote :9898
Remote debugging using :9898
[nds32] Hook remote stopped data address for watchpoints.
0x00000000 in ?? ()
(gdb) load_
```

9.載入後列出程式碼

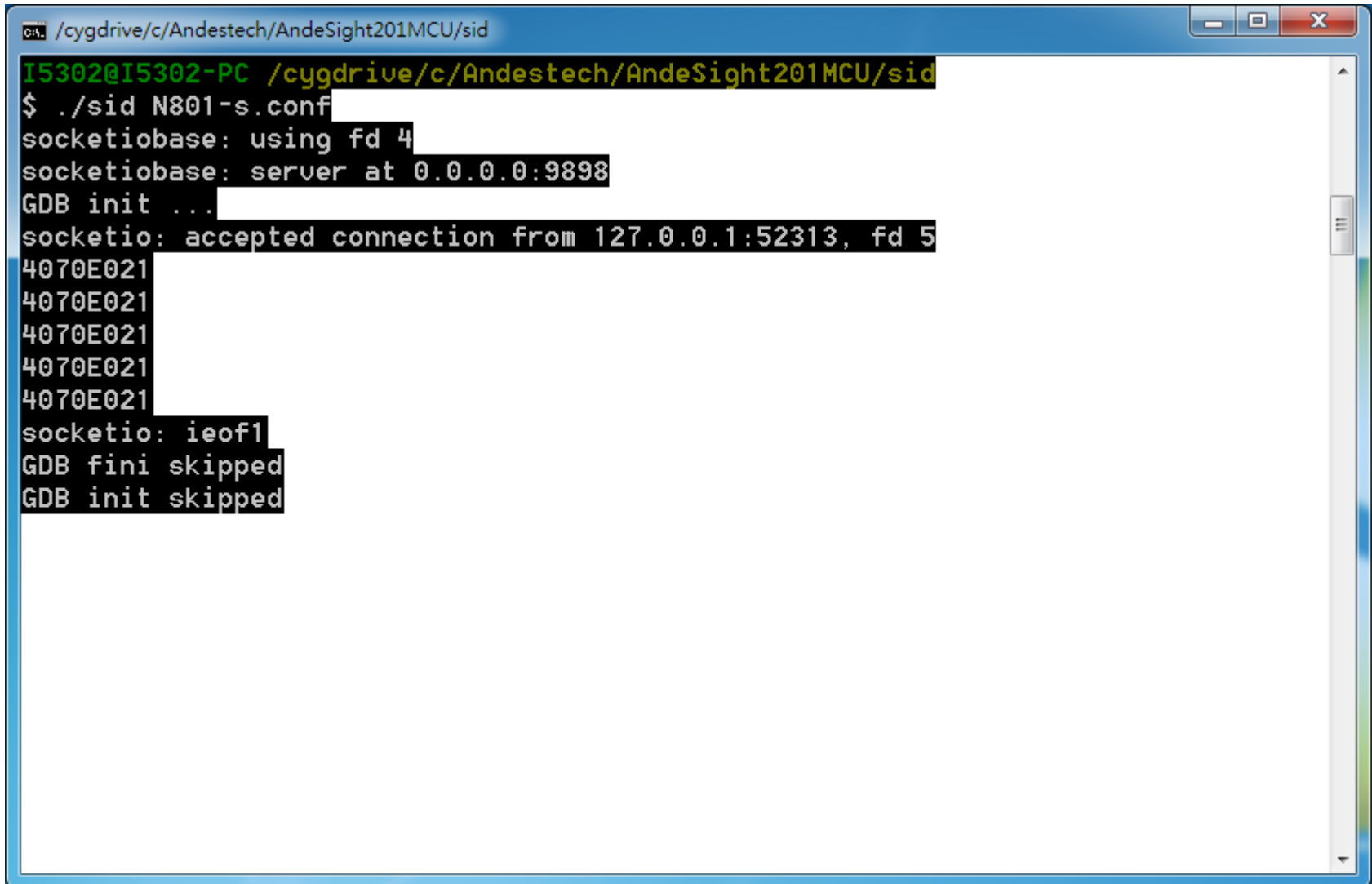
```
C:\ /cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
sending: "qPart:nds32:request:InvalidateCache"
received: ""
sending: "qPart:nds32:request:MemAccBus"
received: ""
Loading section .nds32_init, size 0x2 lma 0x300000
Loading section .init, size 0x4 lma 0x300002
Loading section .text, size 0x18c lma 0x300008
Loading section .rodata, size 0xc lma 0x300194
Loading section .eh_frame, size 0x4 lma 0x3001a0
Loading section .ctors, size 0x4 lma 0x3001a4
Loading section .dtors, size 0x4 lma 0x3001a8
Loading section .jcr, size 0x4 lma 0x3001ac
Start address 0x300008, load size 430
Transfer rate: 11 KB/sec, 47 bytes/write.
sending: "qPart:nds32:request:MemAccCPU"
received: ""
(gdb) l
1      #include <stdio.h>
2
3      int main(){
4          int i;
5          for(i=0; i<5; i++)
6              puts("4070E021");
7              return 1;
8      }(gdb) _
```

10.利用cont指令執行程式碼

```

/cygdrive/c/Andestech/AndeSight201MCU/toolchains/nds32le-elf-mculib-v3m/bin
0x00300088 <+128>:  mov55 $r6,$sp
0x0030008a <+130>:  mov55 $r0,$r6
0x0030008c <+132>:  syscall #6002
0x00300090 <+136>:  mov55 $r0,$r6
0x00300092 <+138>:  addi $r1,$r6,#256
0x00300096 <+142>:  jral5 $r9
0x00300098 <+144>:  addi $r1,$r6,#256
0x0030009c <+148>:  addi.gp $r15,#-224
0x003000a0 <+152>:  beqzs8 0x3000a4 <_start+156>
0x003000a2 <+154>:  jral5 $r15
0x003000a4 <+156>:  movi55 $r15,#0
0x003000a6 <+158>:  beqzs8 0x3000aa <_start+162>
0x003000a8 <+160>:  jral5 $r15
0x003000aa <+162>:  jal 0x300164 <_exit>
0x003000ae <+166>:  ret5 $lp
End of assembler dump.
(gdb) cont
Continuing.
4070E021
4070E021
4070E021
4070E021
4070E021
[Inferior 1 (Remote target) exited with code 01]
(gdb)
```


10.另外的連線模擬器也會執行



```
C:\cygdrive/c/Andestech/AndeSight201MCU/sid
I5302@I5302-PC /cygdrive/c/Andestech/AndeSight201MCU/sid
$ ./sid N801-s.conf
socketiobase: using fd 4
socketiobase: server at 0.0.0.0:9898
GDB init ...
socketio: accepted connection from 127.0.0.1:52313, fd 5
4070E021
4070E021
4070E021
4070E021
4070E021
socketio: ieof1
GDB fini skipped
GDB init skipped
```