

sys163006@embedded: ~

sys163006@embedded:~\$ more my_favorite_poem.txt

재

재 로 걸 리 지 는 것 들 에 아 쉬 워 마 라

버 러 지 는 것 들 에 아 쉬 워 마 라

떠 나 가 는 것 들 에 아 쉬 워 마 라

인 생 에 서 걸 리 지 는 것 들 에 아 쉬 워 마 라

남 겨 있 는 것 들 을 아 쉬 워 해 라

놓 을 것 들 을 놓 을 줄 아 는 자 가

소 중 한 것 들 을 더 소 중 히 할 줄 안 다

찌 꺼 기 를 아 쉬 워 마 라

아 쉬 움 을 아 쉬 워 마 라

지 은 이 : 이 건 욱

sys163006@embedded:~\$ vi my_favorite_poem.txt

sys163006@embedded:~\$ clear

sys163006@embedded:~\$ vi my_favorite_poem.txt

sys163006@embedded:~\$ more my_favorite_poem.txt

재

재 로 걸 리 지 는 것 들 에 아 쉬 워 마 라

버 러 지 는 것 들 에 아 쉬 워 마 라

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아 쉬 움 을 아 쉬 워 마 라

지 은 이 : 이 건 욱

sys163006@embedded:~\$ vi hello.c

sys163006@embedded:~\$ gcc hello.c

sys163006@embedded:~\$ ls

a.out examples.desktop hello.c my_favorite_poem.txt

sys163006@embedded:~\$./a.out

재 미 있는 !!시 스템 프 로 그 래 밍 !!sys163006@embedded:~\$

sys163006@embedded:~\$ cat hello.c

#include <stdio.h>

int main(){

printf("재 미 있는 !!시 스템 프 로 그 래 밍 !!");

}

sys163006@embedded:~\$ ls -l

total 28

-rwxrwxr-x 1 sys163006 sys163006 4716 9월 24 23:18 a.out

-rw-r--r-- 1 sys163006 sys163006 8980 4월 20 2016 examples.desktop

-rw-rw-r-- 1 sys163006 sys163006 92 9월 24 23:18 hello.c

-rw-rw-r-- 1 sys163006 sys163006 404 9월 24 23:14 my_favorite_poem.txt

sys163006@embedded:~\$ mkdir test

sys163006@embedded:~\$ ls

a.out examples.desktop hello.c my_favorite_poem.txt test

sys163006@embedded:~\$ rm test

rm: cannot remove 'test': Is a directory

sys163006@embedded:~\$ pwd test

/home/2-class/sys163006

sys163006@embedded:~\$ rmdir test

sys163006@embedded:~\$ ls

```

a.out examples.desktop hello.c my_favorite_poem.txt
sysl63006@embedded:~$ chmod g+x a.out
sysl63006@embedded:~$ ls -l
total 28
-rwxrwxr-x 1 sysl63006 sysl63006 4716 9월 24 23:18 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-r-- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
sysl63006@embedded:~$ chmod o+w hello.c
sysl63006@embedded:~$ ls -l
total 28
-rwxrwxr-x 1 sysl63006 sysl63006 4716 9월 24 23:18 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
sysl63006@embedded:~$ vi test.c
sysl63006@embedded:~$ ls -l
total 28
-rwxrwxr-x 1 sysl63006 sysl63006 4716 9월 24 23:18 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 0 9월 24 23:31 test.c
sysl63006@embedded:~$ gcc -s test.c
/usr/lib/gcc/i486-linux-gnu/3.4.6/../../../../lib/crt1.o: In function `_start':
(.text+0x18): undefined reference to `main'
collect2: ld returned 1 exit status
sysl63006@embedded:~$ gcc -S test.c
sysl63006@embedded:~$ ls -l
total 24
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 0 9월 24 23:31 test.c
-rw-rw-r-- 1 sysl63006 sysl63006 99 9월 24 23:32 test.s
sysl63006@embedded:~$ as -c test.c test.s
sysl63006@embedded:~$ ls -l
total 28
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:32 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 0 9월 24 23:31 test.c
-rw-rw-r-- 1 sysl63006 sysl63006 99 9월 24 23:32 test.s
sysl63006@embedded:~$ as -o test.o test.s
sysl63006@embedded:~$ ls -l
total 32
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:32 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 0 9월 24 23:31 test.c
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:34 test.o
-rw-rw-r-- 1 sysl63006 sysl63006 99 9월 24 23:32 test.s
sysl63006@embedded:~$ more test.s
.file "test.c"
.section .note.GNU-stack,"",@progbits
.ident "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sysl63006@embedded:~$ ls
a.out examples.desktop hello.c my_favorite_poem.txt test.c test.o test.s
sysl63006@embedded:~$ rm test.c
sysl63006@embedded:~$ rm test.o
sysl63006@embedded:~$ rm test.s

```



```

sysl63006@embedded:~$ vi test.c
sysl63006@embedded:~$ gcc -S test.c
sysl63006@embedded:~$ ls -l
total 28
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:32 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 0 9월 24 23:35 test.c
-rw-rw-r-- 1 sysl63006 sysl63006 99 9월 24 23:35 test.s
sysl63006@embedded:~$ more test.s
.file "test.c"
.section .note.GNU-stack,"",@progbits
.ident "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sysl63006@embedded:~$ as -o test.o test.s
sysl63006@embedded:~$ more test.s
.file "test.c"
.section .note.GNU-stack,"",@progbits
.ident "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sysl63006@embedded:~$ more test.o

***** test.o: Not a text file *****

sysl63006@embedded:~$ vi test.c
sysl63006@embedded:~$ more test.s
.file "test.c"
.section .note.GNU-stack,"",@progbits
.ident "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sysl63006@embedded:~$ gcc -S test.c
test.c:2: error: syntax error before "sdajfoiasjdfoisajdfiojs"
sysl63006@embedded:~$ ls
a.out examples.desktop hello.c my_favorite_poem.txt test.c test.o test.s
sysl63006@embedded:~$ vi test.
sysl63006@embedded:~$ rm test.
sysl63006@embedded:~$ vi test.c
sysl63006@embedded:~$ gcc -S test.c
test.c: In function 'main':
test.c:4: error: 'for' loop initial declaration used outside C99 mode
sysl63006@embedded:~$ vi test.c
sysl63006@embedded:~$ gcc -S test.c
sysl63006@embedded:~$ ls -l
total 36
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:32 a.out
-rw-r--r-- 1 sysl63006 sysl63006 8980 4월 20 2016 examples.desktop
-rw-rw-rw- 1 sysl63006 sysl63006 92 9월 24 23:18 hello.c
-rw-rw-r-- 1 sysl63006 sysl63006 404 9월 24 23:14 my_favorite_poem.txt
-rw-rw-r-- 1 sysl63006 sysl63006 89 9월 24 23:39 test.c
-rw-rw-r-- 1 sysl63006 sysl63006 640 9월 24 23:36 test.o
-rw-rw-r-- 1 sysl63006 sysl63006 546 9월 24 23:39 test.s
sysl63006@embedded:~$ as -o test.o test.s
sysl63006@embedded:~$ more test.s
.file "test.c"
.section .rodata
.LC0:
.string "%d"
.text
.globl main
.type main, @function
main:
pushl %ebp
movl %esp, %ebp
subl $24, %esp
andl $-16, %esp

```

```

        movl    $0, %eax
        addl    $15, %eax
        addl    $15, %eax
        shrl    $4, %eax
        sall    $4, %eax
        subl    %eax, %esp
        movl    $0, -4(%ebp)
.L2:
        cmpl    $9, -4(%ebp)
        jg      .L3
        movl    -4(%ebp), %eax
        movl    %eax, 4(%esp)
        movl    $.LC0, (%esp)
        call    printf
        leal    -4(%ebp), %eax
        incl    (%eax)
        jmp     .L2
.L3:
        leave
        ret
        .size   main, .-main
        .section .note.GNU-stack,"",@progbits
        .ident  "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sys163006@embedded:~$ more test.o

```

***** test.o: Not a text file *****

```

sys163006@embedded:~$ hexdump test.o
00000000 457f 464c 0101 0001 0000 0000 0000 0000
00000010 0001 0003 0001 0000 0000 0000 0000 0000
00000020 01b8 0000 0000 0000 0034 0000 0000 0028
00000030 000b 0008 8955 83e5 18ec e483 b8f0 0000
00000040 0000 c083 830f 0fc0 e8c1 c104 04e0 c429
00000050 45c7 00fc 0000 8300 fc7d 7f09 8b1a fc45
00000060 4489 0424 04c7 0024 0000 e800 fffc ffff
00000070 458d fffc eb00 c9e0 25c3 0064 4700 4343
00000080 203a 4728 554e 2029 2e33 2e34 2036 4428
00000090 6265 6169 206e 2e33 2e34 2d36 2935 0000
000000a0 0000 0000 0000 0000 0000 0000 0000 0000
000000b0 0001 0000 0000 0000 0000 0000 0004 fff1
000000c0 0000 0000 0000 0000 0000 0000 0003 0001
000000d0 0000 0000 0000 0000 0000 0000 0003 0003
000000e0 0000 0000 0000 0000 0000 0000 0003 0004
000000f0 0000 0000 0000 0000 0000 0000 0003 0005
00001000 0000 0000 0000 0000 0000 0000 0003 0006
00001010 0000 0000 0000 0000 0000 0000 0003 0007
00001020 0008 0000 0000 0000 0045 0000 0012 0001
00001030 000d 0000 0000 0000 0000 0000 0010 0000
00001040 7400 7365 2e74 0063 616d 6e69 7000 6972
00001050 746e 0066 0033 0000 0501 0000 0038 0000
00001060 0902 0000 2e00 7973 746d 6261 2e00 7473
00001070 7472 6261 2e00 6873 7473 7472 6261 2e00
00001080 6572 2e6c 6574 7478 2e00 6164 6174 2e00
00001090 7362 0073 722e 646f 7461 0061 6e2e 746f
000010a0 2e65 4e47 2d55 7473 6361 006b 632e 6d6f
000010b0 656d 746e 0000 0000 0000 0000 0000 0000
000010c0 0000 0000 0000 0000 0000 0000 0000 0000
*
000010e0 001f 0000 0001 0000 0006 0000 0000 0000
000010f0 0034 0000 0045 0000 0000 0000 0000 0000
00002000 0001 0000 0000 0000 001b 0000 0009 0000
00002010 0040 0000 0000 0000 0154 0000 0010 0000
00002020 0009 0000 0001 0000 0004 0000 0008 0000

```



```

0000230 0025 0000 0001 0000 0003 0000 0000 0000
0000240 0079 0000 0000 0000 0000 0000 0000 0000
0000250 0001 0000 0000 0000 0000 002b 0000 0008 0000
0000260 0003 0000 0000 0000 0000 0079 0000 0000 0000
0000270 0000 0000 0000 0000 0000 0001 0000 0000 0000
0000280 0030 0000 0001 0000 0002 0000 0000 0000 0000
0000290 0079 0000 0003 0000 0000 0000 0000 0000 0000
00002a0 0001 0000 0000 0000 0000 0038 0000 0001 0000
00002b0 0000 0000 0000 0000 0000 007c 0000 0000 0000
00002c0 0000 0000 0000 0000 0000 0001 0000 0000 0000
00002d0 0048 0000 0001 0000 0030 0000 0000 0000 0000
00002e0 007c 0000 0023 0000 0000 0000 0000 0000 0000
00002f0 0001 0000 0001 0000 0011 0000 0003 0000
0000300 0000 0000 0000 0000 0164 0000 0051 0000
0000310 0000 0000 0000 0000 0001 0000 0000 0000
0000320 0001 0000 0002 0000 0000 0000 0000 0000
0000330 00a0 0000 00a0 0000 000a 0000 0008 0000
0000340 0004 0000 0010 0000 0009 0000 0003 0000
0000350 0000 0000 0000 0000 0140 0000 0014 0000
0000360 0000 0000 0000 0000 0001 0000 0000 0000
0000370

```

```

sys163006@embedded:~$ more test.c
#include <stdio.h>

```

```

int main(){
    int i = 0;
    for(; i < 10; i++){
        printf("%d", i);
    }
}

```

```

sys163006@embedded:~$ ./a.out

```

```

-bash: ./a.out: Permission denied

```

```

sys163006@embedded:~$ gcc test.c

```

```

sys163006@embedded:~$ ./a.out

```

```

0123456789sys163006@embedded:~$ gcc hello.c

```

```

sys163006@embedded:~$ ./a.out

```

```

재미있 .....는 !!시스템프로그래밍 !!sys163006@embedded:~$ vi hello.c

```

```

sys163006@embedded:~$ gcc hello.c

```

```

sys163006@embedded:~$ ./a.out

```

```

재미있 .....는 !!시스템프로그래밍 !!

```

```

sys163006@embedded:~$ cat test.s

```

```

.file "test.c"
.section .rodata
.LC0:
.string "%d"
.text
.globl main
.type main, @function
main:
    pushl    %ebp
    movl    %esp, %ebp
    subl    $24, %esp
    andl    $-16, %esp
    movl    $0, %eax
    addl    $15, %eax
    addl    $15, %eax
    shrl    $4, %eax
    sall    $4, %eax
    subl    %eax, %esp
    movl    $0, -4(%ebp)
.L2:
    cmpl    $9, -4(%ebp)
    jg      .L3

```

```

        movl    -4(%ebp), %eax
        movl    %eax, 4(%esp)
        movl    $.LC0, (%esp)
        call    printf
        leal    -4(%ebp), %eax
        incl    (%eax)
        jmp     .L2
.L3:
        leave
        ret
        .size   main, .-main
        .section .note.GNU-stack,"",@progbits
        .ident  "GCC: (GNU) 3.4.6 (Debian 3.4.6-5)"
sys163006@embedded:~$
sys163006@embedded:~$ gcc -o gdb_test.out gdb_test.c
gcc: gdb_test.c: No such file or directory
gcc: no input files
sys163006@embedded:~$ ls
a.out  examples.desktop  hello.c  my_favorite_poem.txt  test.c  test.o  test.s
sys163006@embedded:~$ vi gdb_test.c
sys163006@embedded:~$ cat gdb_test.c
#include <stdio.h>

int main(){

    int a[4] = {5,6,7,8};
    int *pa;

    printf("%d\n", a[0]);
    printf("%d\n", a[2]);
    printf("%d\n", *a);
    printf("%d\n", *(a+2));
    printf("%d\n", *pa);
    printf("%d\n", *(pa+2));
}

sys163006@embedded:~$ whoami
sys163006
sys163006@embedded:~$ date
2019. 09. 24. (㉔) 23:49:31 KST
sys163006@embedded:~$ gcc -o gdb_test.out gdb_test.c
gcc: gdb: No such file or directory
sys163006@embedded:~$ gcc -o gdb_test.out gdb_test.c
gdb_test.c:1:19: stdio.h: No such file or directory
sys163006@embedded:~$ vi gdb_test.c
sys163006@embedded:~$ gcc -o gdb_test.out gdb_test.c
sys163006@embedded:~$ ./gdb_test.out
5
7
5
7
-14646387
-2063401279
sys163006@embedded:~$ vi gdb_test.c
sys163006@embedded:~$ rm gdb_test.out
sys163006@embedded:~$ gcc -o gdb_test.out gdb_test.c
sys163006@embedded:~$ ./gdb_test.out
5
7
5
7
Segmentation fault (core dumped)
sys163006@embedded:~$ gcc -g -o gdb_test.out gdb_test.c

```

```
gcc: gdb: No such file or directory
sys163006@embedded:~$ gcc -g -o gdb_test.out gdb_test.c
sys163006@embedded:~$ gdb gdb_test.out
GNU gdb (Ubuntu 7.11.1-0ubuntu1~16.5) 7.11.1
Copyright (C) 2016 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 "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.
For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from gdb_test.out...done.
(gdb) run
Starting program: /home/2-class/sys163006/gdb_test.out
5
7
5
7

Program received signal SIGSEGV, Segmentation fault.
0x080483f7 in main () at gdb_test.c:10
10         printf("%d\n", *pa);
(gdb) list
5      int main(){
6          printf("%d\n", a[0]);
7          printf("%d\n", a[2]);
8          printf("%d\n", *a);
9          printf("%d\n", *(a+2));
10         printf("%d\n", *pa);
11         printf("%d\n", *(pa+2));
12     }
13
(gdb) break 9
Breakpoint 1 at 0x80483dd: file gdb_test.c, line 9.
(gdb) run
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/2-class/sys163006/gdb_test.out
5
7
5

Breakpoint 1, main () at gdb_test.c:9
9         printf("%d\n", *(a+2));
(gdb) n
7
10         printf("%d\n", *pa);
(gdb) y
Undefined command: "y". Try "help".
(gdb) n

Program received signal SIGSEGV, Segmentation fault.
0x080483f7 in main () at gdb_test.c:10
10         printf("%d\n", *pa);
(gdb) n

Program terminated with signal SIGSEGV, Segmentation fault.
```

The program no longer exists.

(gdb)

The program is not being run.

(gdb) stop

(gdb)

(gdb) d

Delete all breakpoints? (y or n) y

(gdb) y

Undefined command: "y". Try "help".

(gdb) help

List of classes of commands:

aliases -- Aliases of other commands

breakpoints -- Making program stop at certain points

data -- Examining data

files -- Specifying and examining files

internals -- Maintenance commands

obscure -- Obscure features

running -- Running the program

stack -- Examining the stack

status -- Status inquiries

support -- Support facilities

tracepoints -- Tracing of program execution without stopping the program

user-defined -- User-defined commands

Type "help" followed by a class name for a list of commands in that class.

Type "help all" for the list of all commands.

Type "help" followed by command name for full documentation.

Type "apropos word" to search for commands related to "word".

Command name abbreviations are allowed if unambiguous.

(gdb) quit

sys163006@embedded:~\$ whoami

sys163006

sys163006@embedded:~\$ date

2019. 09. 24. (㉸) 23:56:59 KST

sys163006@embedded:~\$ whoami

sys163006

sys163006@embedded:~\$ date

2019. 09. 24. (㉸) 23:57:15 KST

sys163006@embedded:~\$
