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簡介：

▼ \$make

```
siaoweiwei@huangjinweide-MacBook-Pro:cpp_hw1$(git::master) make
g++ -c -o func.o func.cpp -Wall -Werror -c -g
g++ -c -o main.o main.cpp -Wall -Werror -c -g
g++ func.o main.o -o hw1
siaoweiwei@huangjinweide-MacBook-Pro:cpp_hw1$(git::master) █
```

▼ \$gdb hw1

```
siaoweiwei@huangjinweide-MacBook-Pro:cpp_hw1$(git::master) gdb hw1
GNU gdb (GDB) 8.2.50.20190226-git
Copyright (C) 2019 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-apple-darwin18.2.0".
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 hw1...
(gdb) █
```

▼ (1)印出程式碼

```
(gdb) list
1      // type $make
2      //      ./hw1 "string"
3      // The program will print out all the characters appeared in the string
4      #include "header.h"
5
6      using namespace std;
7
8      int main(int argc, char **argv){
9          char *ptr;
10         int len;
(gdb) █
```

▼ 印出所有 function

```
(gdb) info functions
All defined functions:

File func.cpp:
13:     void Insert(lnode*, char);
6:     lnode *NewNode();
38:     void Traverse_List(lnode*);

File main.cpp:
8:     int main(int, char**);

Non-debugging symbols:
0x000000001000000000 _mh_execute_header
(gdb) █
```

▼ (2)設定 breakpoint

```
(gdb) b Insert
Breakpoint 2 at 0x100000da2: file func.cpp, line 14.
(gdb) █
```

```
(gdb) b main
Breakpoint 1 at 0x100000eb6: file main.cpp, line 11.
(gdb) █
```

▼ (3)向下執行程式碼(直到 breakpoint)

```
(gdb) set args apple is sweet
(gdb) run
```

▼ (4)向下執行一行程式碼

```

(gdb) n
15         for(int i=1; i<argc; i++){
(gdb) n
16             len = strlen(argv[i]);
(gdb) n
17             ptr = strdup(argv[i]);
(gdb) n
19             for(int i=0; i<len; i++, ptr++){
(gdb) n
20                 Insert(head, *ptr);
(gdb) n

Thread 3 hit Breakpoint 2, Insert (head=0x100200000, ptr=97 'a') at func.cpp:14
14     struct lnode *node = NULL;
(gdb) n
17     for(node=head; node->next != NULL; node = node->next){
(gdb) n
27         if(node->next == NULL){
(gdb) n
28             node->next = NewNode();
(gdb) n
29             node->key = ptr;
(gdb) █

```

▼ (5)印出特定變數值(ex: 變數 a 現在的值)

```

30             node->cnt++;
(gdb)
31         }
(gdb) p node->cnt
$2 = 1
(gdb) █

```

▼ (6)設定持續印出某變數值

```

(gdb) display ptr
1: ptr = 97 'a'
(gdb) n
35      }
1: ptr = 97 'a'
(gdb)
main (argc=4, argv=0x7ffefbfe9d0) at main.cpp:19
19      for(int i=0; i<len; i++, ptr++){
(gdb)
20          Insert(head, *ptr);
(gdb)

Thread 3 hit Breakpoint 2, Insert (head=0x100200000, ptr=112 'p') at func.cpp:14
14      struct lnode *node = NULL;
1: ptr = 112 'p'
(gdb)
17      for(node=head; node->next != NULL; node = node->next){
1: ptr = 112 'p'
(gdb)
18          if(node->key == ptr){
1: ptr = 112 'p'
(gdb) █

```

(7)結束 debugger

```

(gdb) quit
A debugging session is active.

        Inferior 1 [process 5129] will be killed.

Quit anyway? (y or n) y
siaoWeiwei@huangjinweide-MacBook-Pro:cpp_hw1$(git::master) █

```