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Class: IT007.N11.KHCL.1

## OPERATING SYSTEM LAB 3'S REPORT

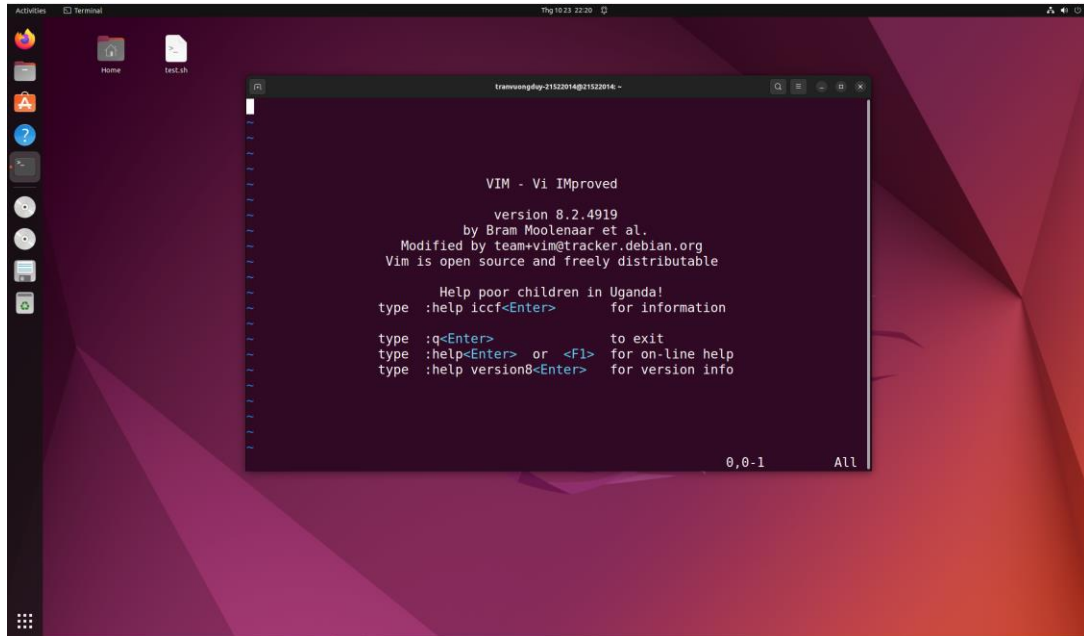
### SUMMARY

Task		Status	Page
Sinh viên chuẩn bị	Trình soạn thảo văn bản vim	Hoàn thành	2
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Self-scores:

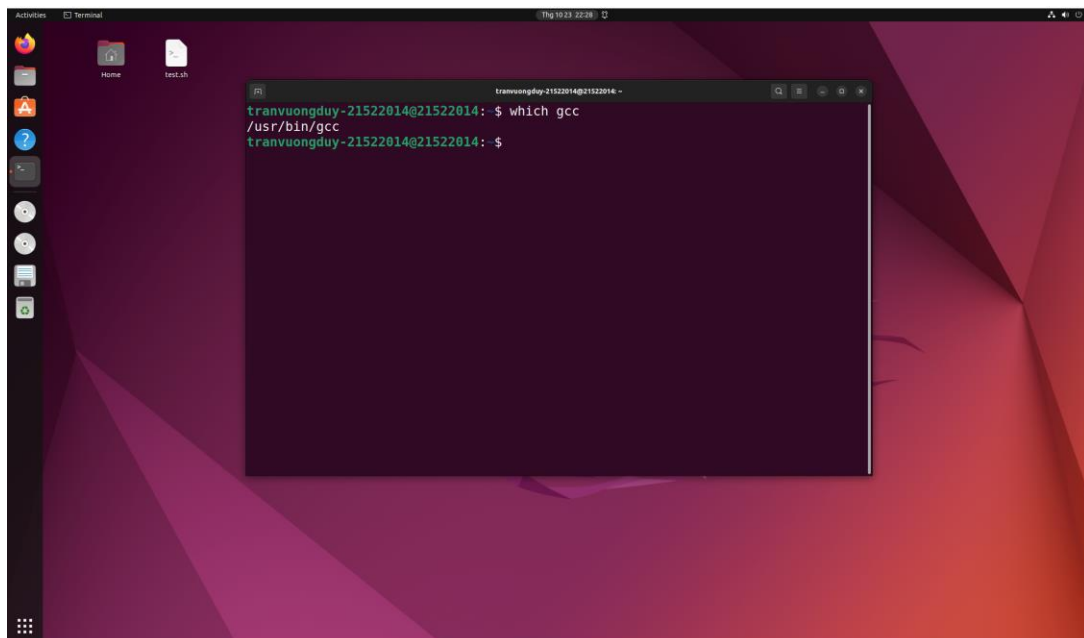
# Sinh viên chuẩn bị

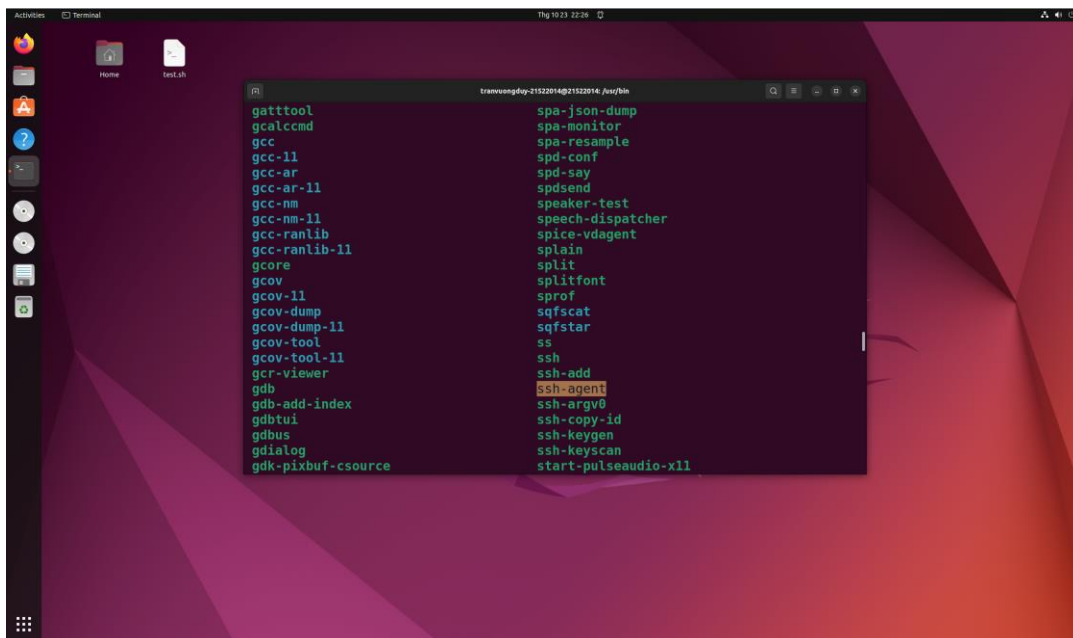
## 1. Trình soạn thảo văn bản vim



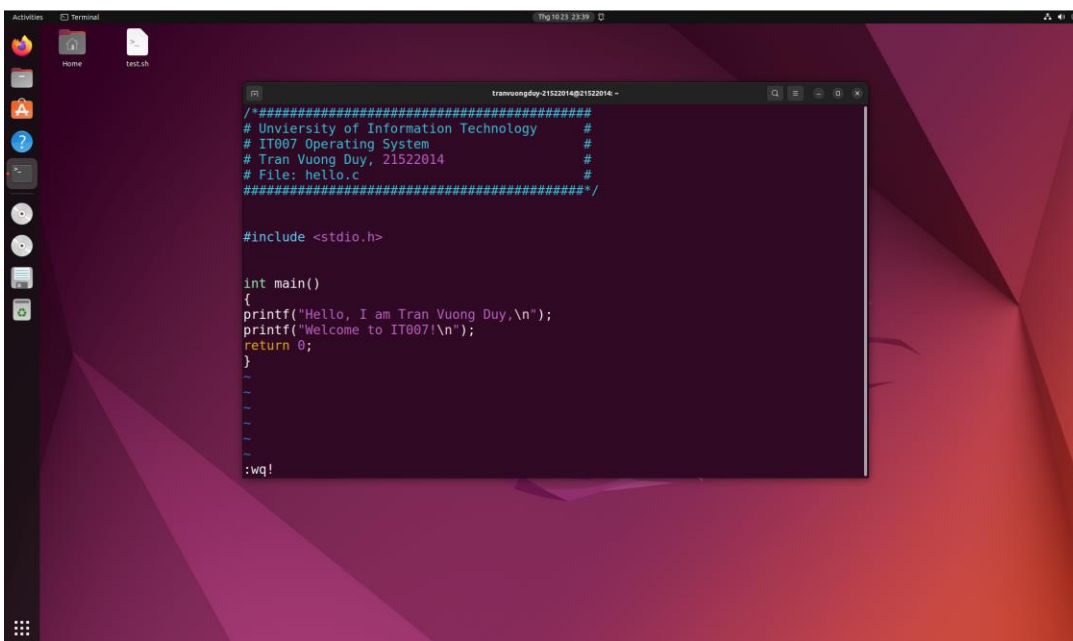
Cài đặt thành công vim

## 2. Trình soạn thảo văn bản vim

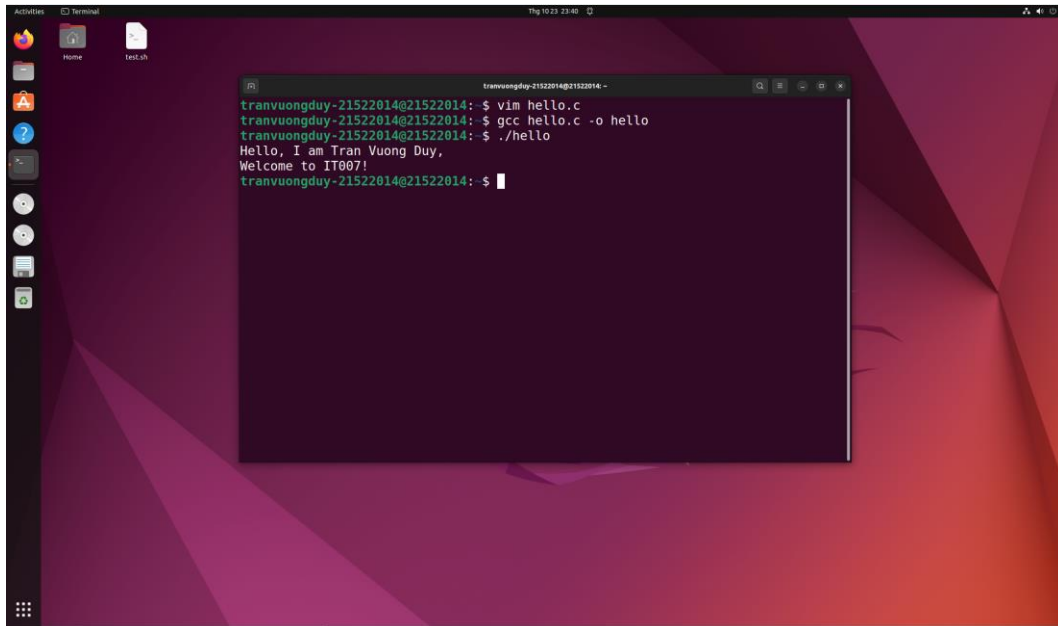




Cài đặt thành công gcc



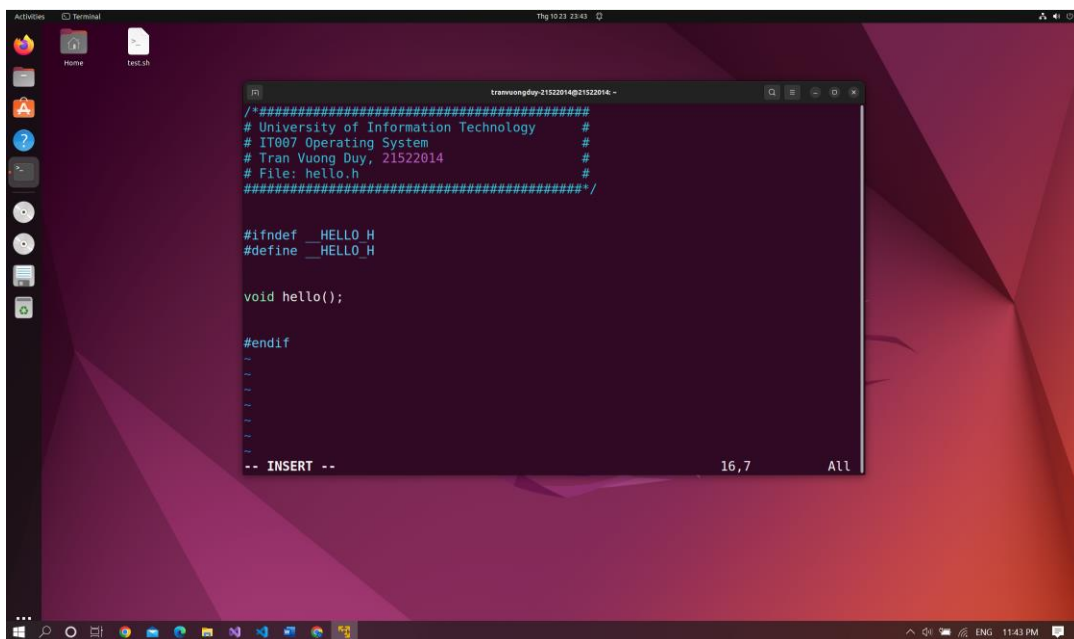
Soạn chương trình hello.c



A terminal window on a Linux desktop with a purple and red geometric background. The terminal shows the following commands and output:

```
tranvuongduy-21522014@21522014: ~$ vim hello.c
tranvuongduy-21522014@21522014: ~$ gcc hello.c -o hello
tranvuongduy-21522014@21522014: ~$ ./hello
Hello, I am Tran Vuong Duy,
Welcome to IT007!
tranvuongduy-21522014@21522014: ~$
```

Chạy chương trình hello.c



A terminal window on the same Linux desktop, showing the editing of a C header file. The terminal displays the following content:

```
/*#####*/
# University of Information Technology #
# IT007 Operating System #
# Tran Vuong Duy, 21522014 #
# File: hello.h #
#####*/

#ifndef __HELLO_H
#define __HELLO_H

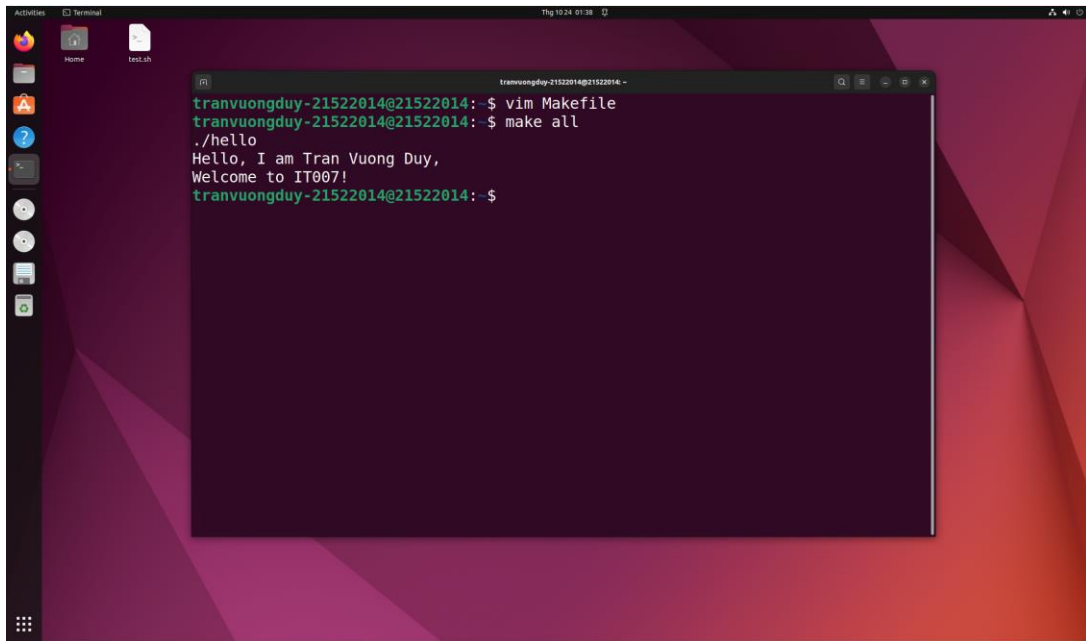
void hello();

#endif
~
~
~
~
-- INSERT -- 16,7 All
```

Soạn chương trình hello.h

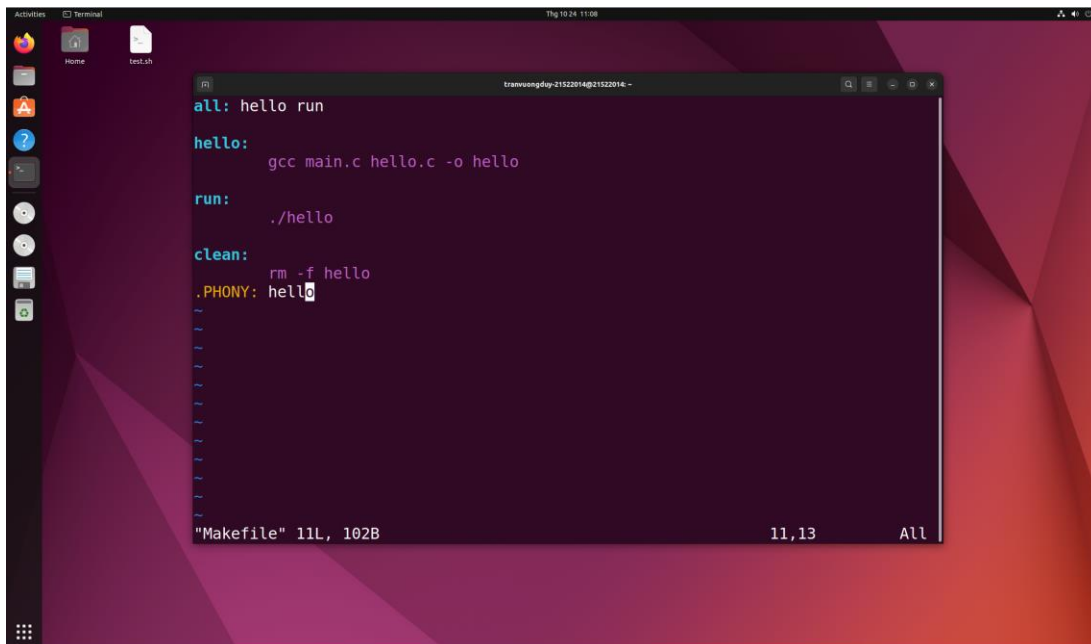






```
tranvuongduy-21522014@21522014:~$ vim Makefile
tranvuongduy-21522014@21522014:~$ make all
./hello
Hello, I am Tran Vuong Duy,
Welcome to IT007!
tranvuongduy-21522014@21522014:~$
```

Biên dịch và chạy chương trình bằng lệnh make all



```
all: hello run

hello:
    gcc main.c hello.c -o hello

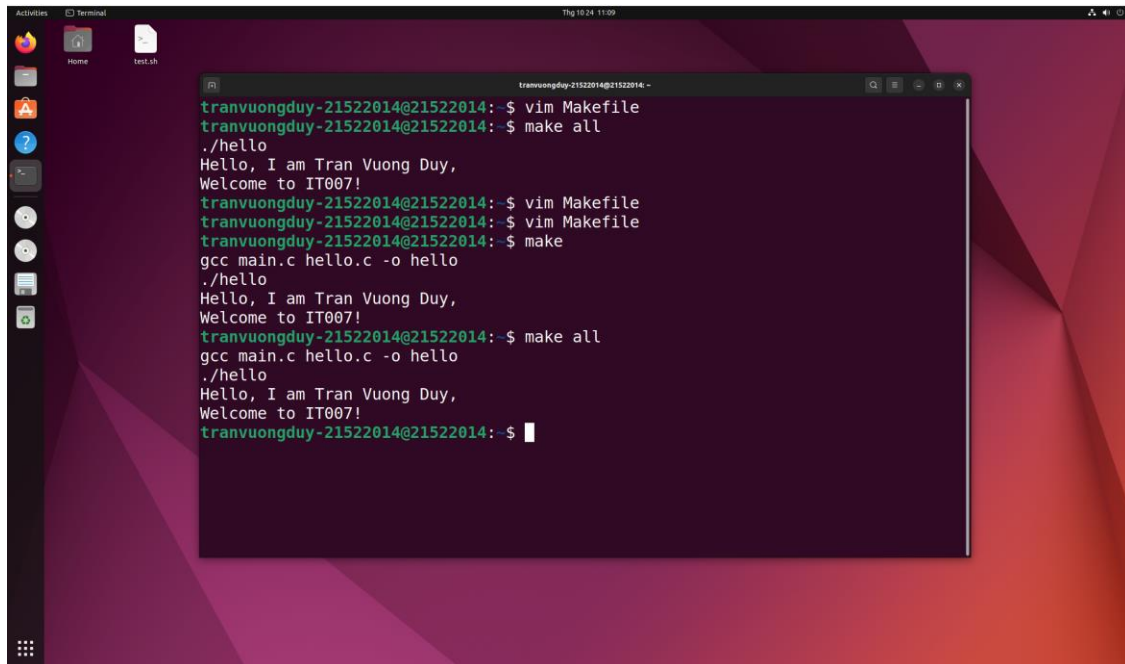
run:
    ./hello

clean:
    rm -f hello

.PHONY: hello

"Makefile" 11L, 102B      11,13      All
```

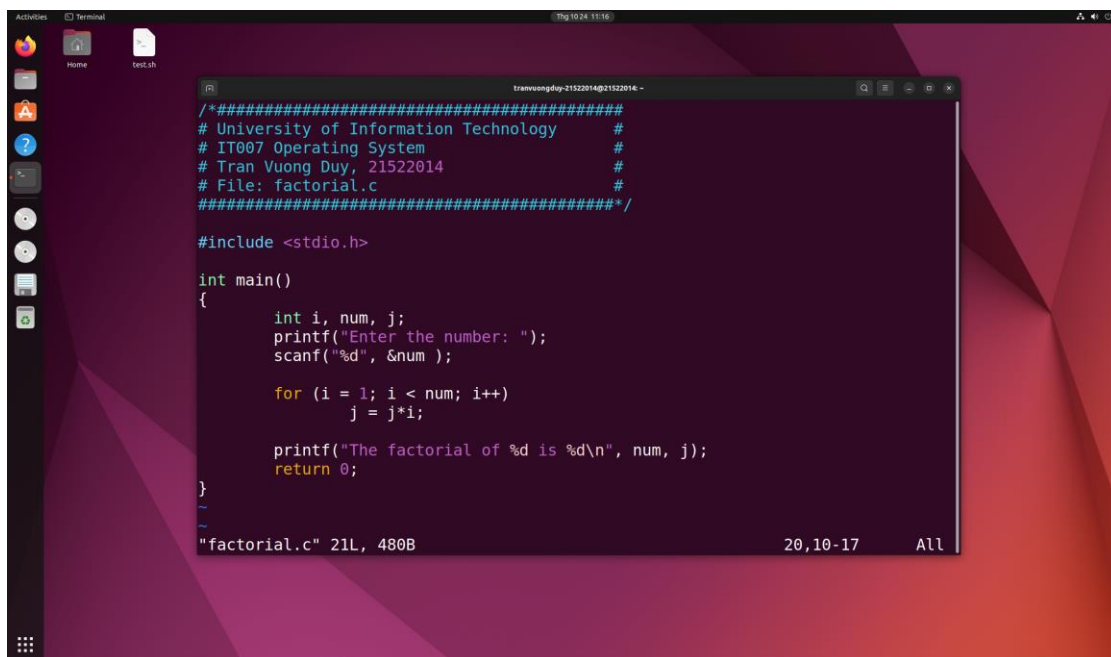
Thêm .PHONY: hello để ép buộc make luôn thực thi hello



```
tranvuongduy-21522014@21522014:~$ vim Makefile
tranvuongduy-21522014@21522014:~$ make all
./hello
Hello, I am Tran Vuong Duy,
Welcome to IT007!
tranvuongduy-21522014@21522014:~$ vim Makefile
tranvuongduy-21522014@21522014:~$ vim Makefile
tranvuongduy-21522014@21522014:~$ make
gcc main.c hello.c -o hello
./hello
Hello, I am Tran Vuong Duy,
Welcome to IT007!
tranvuongduy-21522014@21522014:~$ make all
gcc main.c hello.c -o hello
./hello
Hello, I am Tran Vuong Duy,
Welcome to IT007!
tranvuongduy-21522014@21522014:~$
```

Chạy chương trình

#### 4. Trình gỡ lỗi



```
/*#####
# University of Information Technology #
# IT007 Operating System #
# Tran Vuong Duy, 21522014 #
# File: factorial.c #
#####*/

#include <stdio.h>

int main()
{
    int i, num, j;
    printf("Enter the number: ");
    scanf("%d", &num );

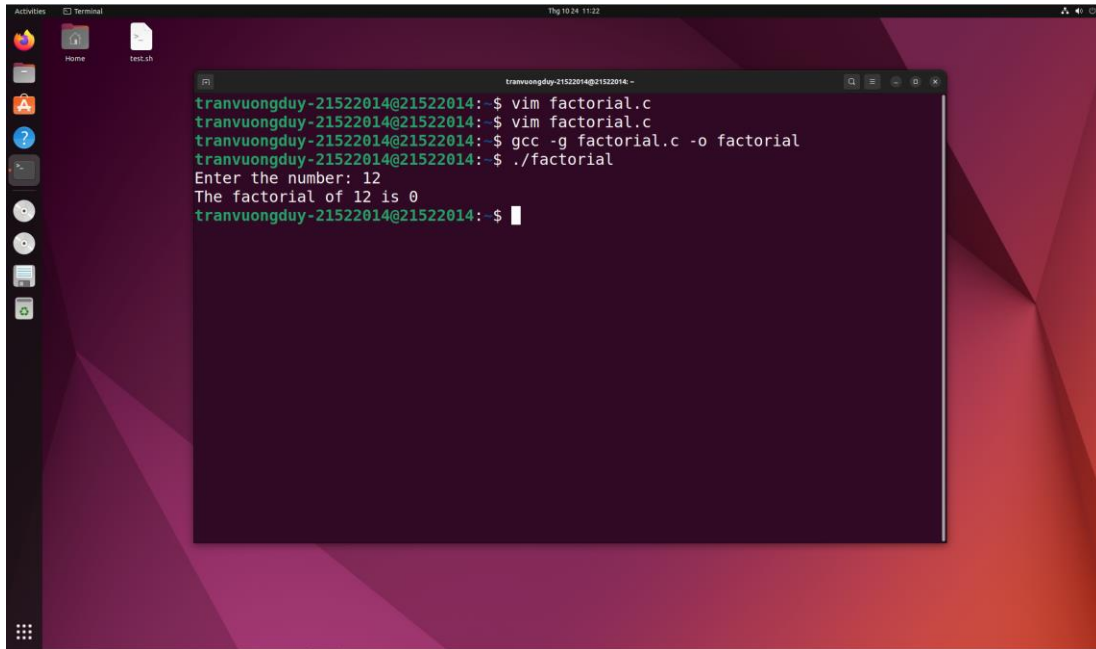
    for (i = 1; i < num; i++)
        j = j*i;

    printf("The factorial of %d is %d\n", num, j);
    return 0;
}

~
~
"factorial.c" 21L, 480B 20,10-17 All
```

Soạn chương trình factorial.c

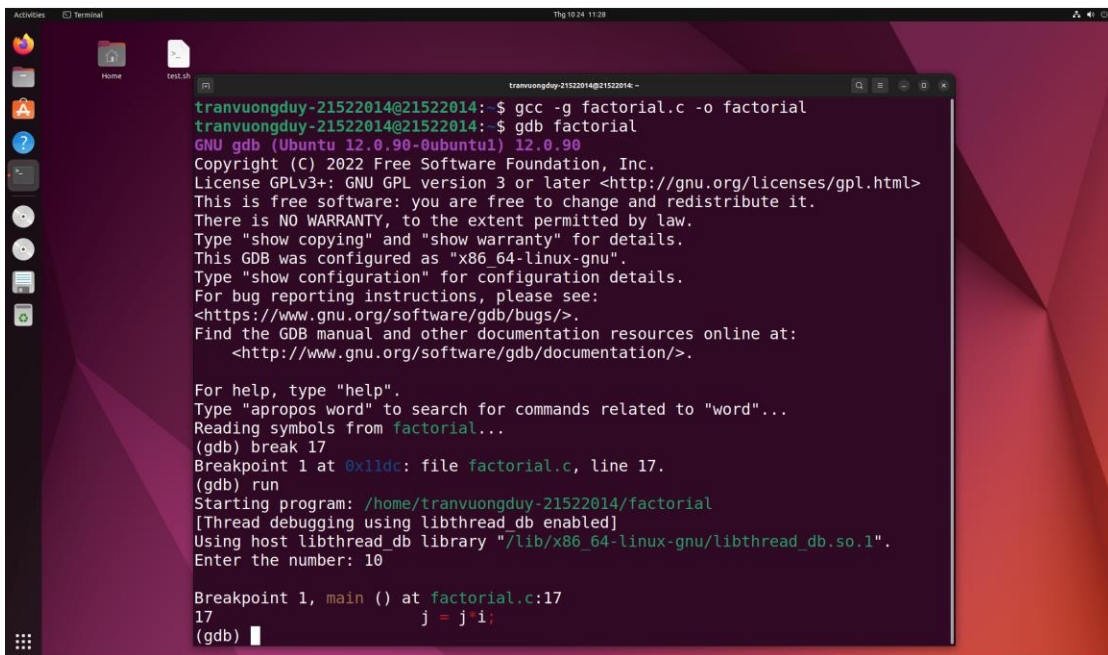




A terminal window on a Linux desktop. The user runs a series of commands to compile and execute a C program named factorial.c. The program prompts for a number, and the user enters 12. The output shows the factorial of 12 is 0.

```
tranvuongduy-21522014@21522014:~$ vim factorial.c
tranvuongduy-21522014@21522014:~$ vim factorial.c
tranvuongduy-21522014@21522014:~$ gcc -g factorial.c -o factorial
tranvuongduy-21522014@21522014:~$ ./factorial
Enter the number: 12
The factorial of 12 is 0
tranvuongduy-21522014@21522014:~$
```

Chạy thử chương trình factorial.c



A terminal window showing the same compilation and execution steps as the first image, but with the addition of GDB. The user runs 'gdb factorial' and then 'run'. The program prompts for a number, and the user enters 10. The output shows the factorial of 10 is 3628800.

```
tranvuongduy-21522014@21522014:~$ gcc -g factorial.c -o factorial
tranvuongduy-21522014@21522014:~$ gdb factorial
GNU gdb (Ubuntu 12.0.90-0ubuntu1) 12.0.90
Copyright (C) 2022 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:
<https://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 factorial...
(gdb) break 17
Breakpoint 1 at 0x11dc: file factorial.c, line 17.
(gdb) run
Starting program: /home/tranvuongduy-21522014/factorial
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Enter the number: 10

Breakpoint 1, main () at factorial.c:17
17      j = j*i;
(gdb)
```

```
trantuan@21522014@21522014: ~$ gdb ./factorial
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://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 ./factorial...
(gdb) break 17
Breakpoint 1 at 0x11dc: file factorial.c, line 17.
(gdb) run
Starting program: /home/trantuan@21522014@21522014: ~/factorial
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Enter the number: 10

Breakpoint 1, main () at factorial.c:17
17      j = j*i;
(gdb) print i
$1 = 1
(gdb) print j
$2 = 0
(gdb) print num
$3 = 10
(gdb) print/x i
$4 = 0x1
(gdb) S
```

Chạy gdb để gỡ lỗi

```
trantuan@21522014@21522014: ~$ gdb ./factorial
Continuing.

Breakpoint 1, main () at factorial.c:18
18      j = j*i;
(gdb) c
Continuing.

Breakpoint 1, main () at factorial.c:18
18      j = j*i;
(gdb) c
Continuing.

Breakpoint 1, main () at factorial.c:18
18      j = j*i;
(gdb) c
Continuing.

Breakpoint 1, main () at factorial.c:18
18      j = j*i;
(gdb) c
Continuing.

Breakpoint 1, main () at factorial.c:18
18      j = j*i;
(gdb) c
Continuing.
The factorial of 10 is 362880
[Inferior 1 (process 6642) exited normally]
(gdb)
```

Tiếp tục sửa chương trình và gỡ lỗi, chương trình chạy đúng