RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

Recitation 1

Jae Woo Joo

TA Information

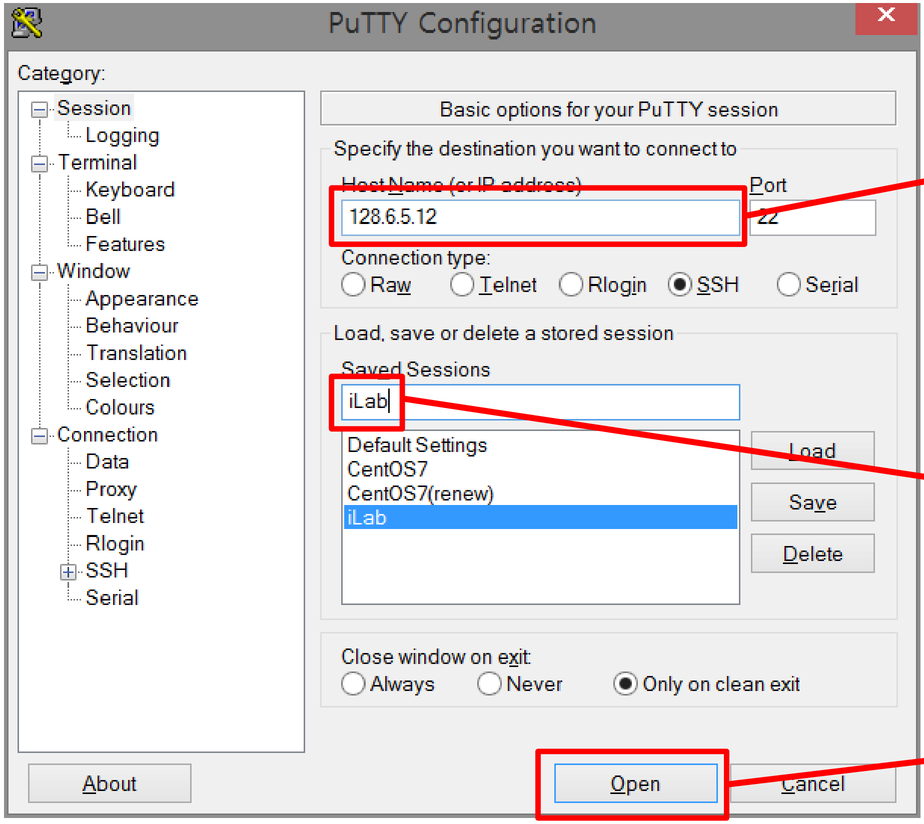
- TA : Jae Woo Joo
- Office : Hill 402
- Office hour : Monday 11:00 a.m. – 12:00 p.m.
- Email : jaewoo.joo@cs.rutgers.edu

How to use iLab Machine

- https://www.cs.rutgers.edu/resources/instructional-lab

- Putty/WinSCP
  - Download “Putty.exe” from http://www.putty.org/ to access from your co mputer
- Or X2Go
  - Download “X2Go” from http://wiki.x2go.org/doku.php/download:start to a ccess from your computer
  - Follow the instructions from https://www.cs.rutgers.edu/resources/accessing-computer-science-linux-desktop-using-x2go
- Or Terminal/Command line
  - ssh netid@address
  - e.g. ssh jj552@command.cs.rutgers.edu

How to use iLab Machine (Using Putty)



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): 128.6.5.12

Port: 22

Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

Saved Sessions: iLab

Default Settings
CentOS7
CentOS7(renew)
iLab

Close window on exit: ○ Always ○ Never ● Only on clean exit

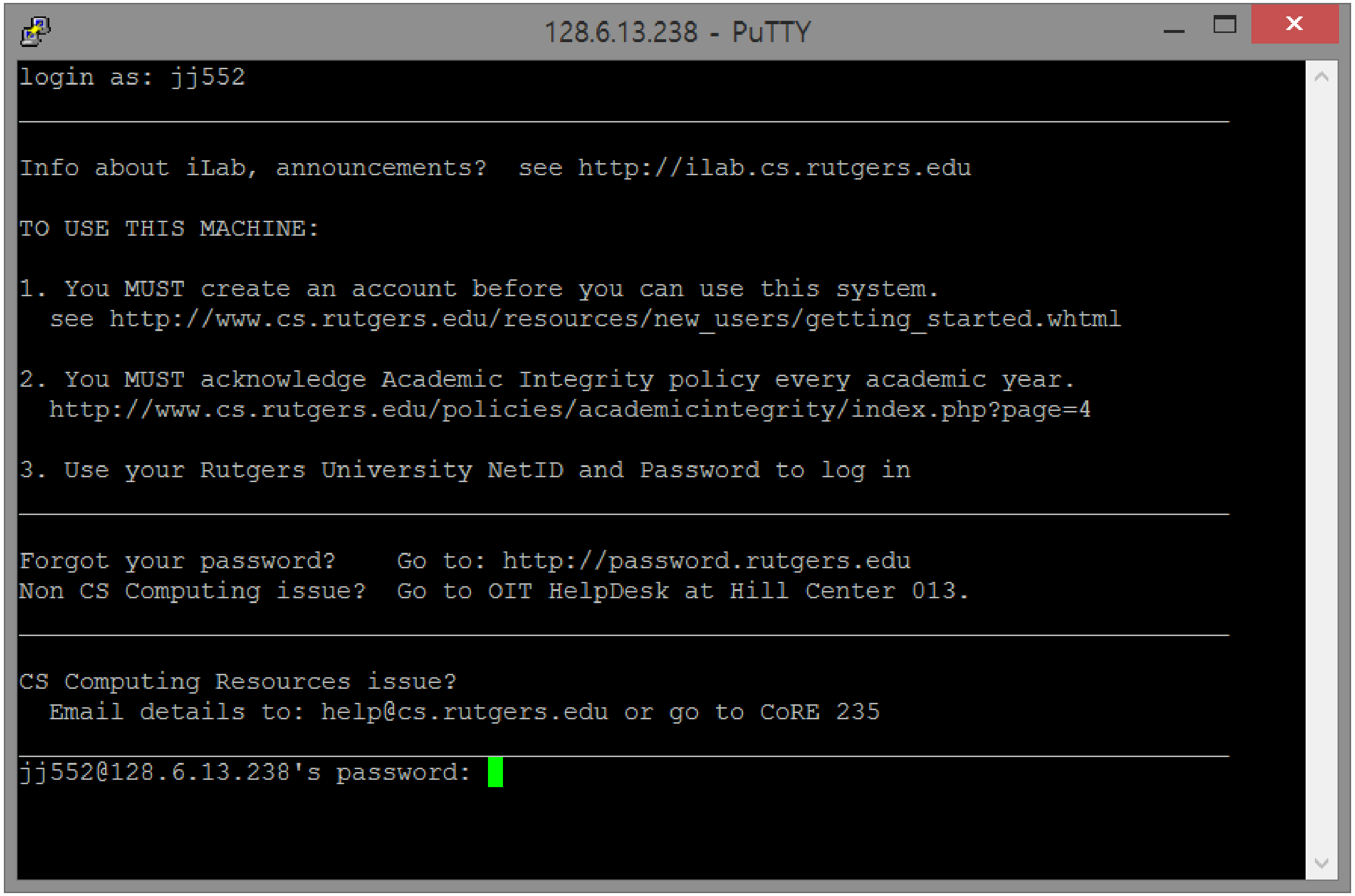
Put the IP address of the machine in iLab (the IP address may be different as it is shown)

Save the session

Connect iLab Machine

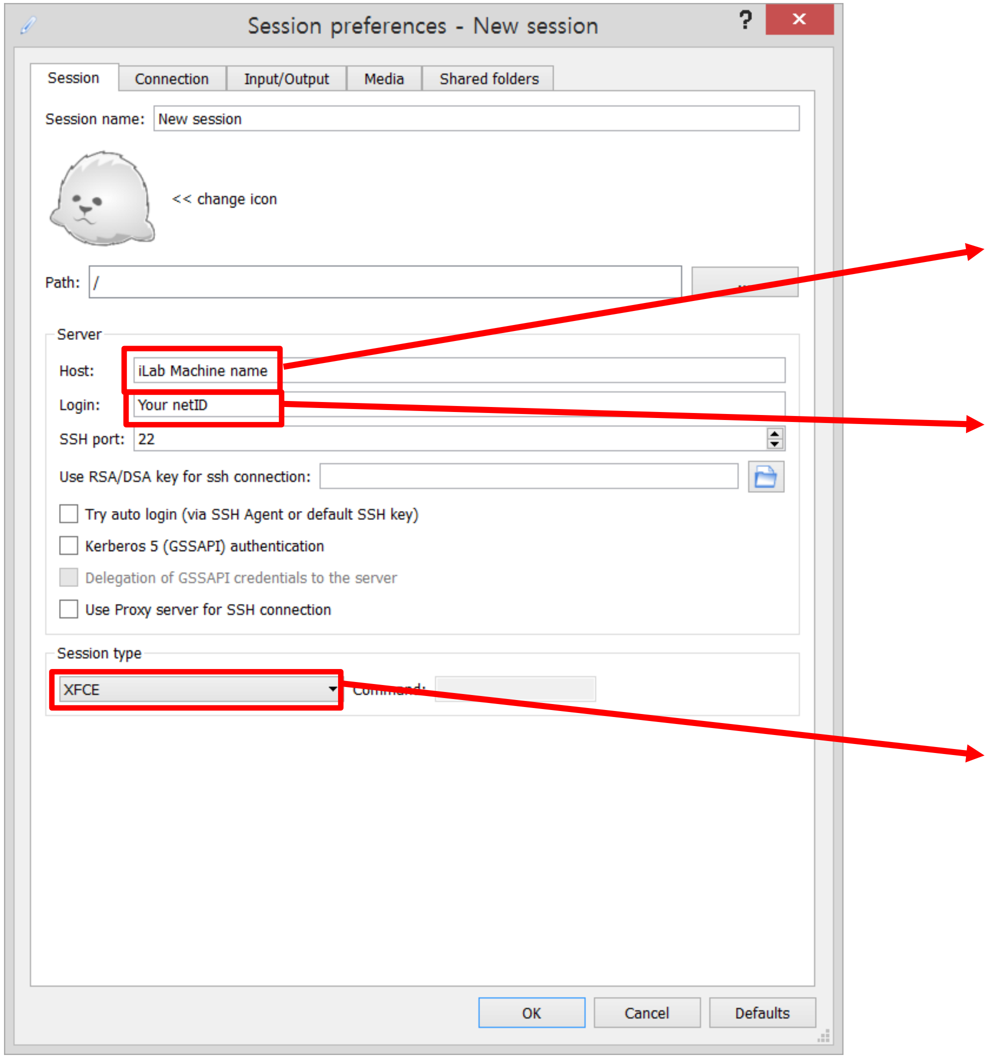
How to use iLab Machine (Using Putty)

- Login with your netID



```
login as: jj552
________________________________________________________________________________

Info about iLab, announcements?  see http://ilab.cs.rutgers.edu

TO USE THIS MACHINE:

1. You MUST create an account before you can use this system.
   see http://www.cs.rutgers.edu/resources/new_users/getting_started.whtml

2. You MUST acknowledge Academic Integrity policy every academic year.
   http://www.cs.rutgers.edu/policies/academicintegrity/index.php?page=4

3. Use your Rutgers University NetID and Password to log in
________________________________________________________________________________

Forgot your password?    Go to: http://password.rutgers.edu
Non CS Computing issue?  Go to OIT HelpDesk at Hill Center 013.
________________________________________________________________________________

CS Computing Resources issue?
   Email details to: help@cs.rutgers.edu or go to CoRE 235
________________________________________________________________________________
jj552@128.6.13.238's password: 
```

How to use iLab Machine (Using X2go)



Session preferences - New session

Session name: New session

Path: /

Server

Host: iLab Machine name

Login: Your netID

SSH port: 22

Use RSA/DSA key for ssh connection:

□ Try auto login (via SSH Agent or default SSH key)

□ Kerberos 5 (GSSAPI) authentication

□ Delegation of GSSAPI credentials to the server

□ Use Proxy server for SSH connection

Session type

XFCE

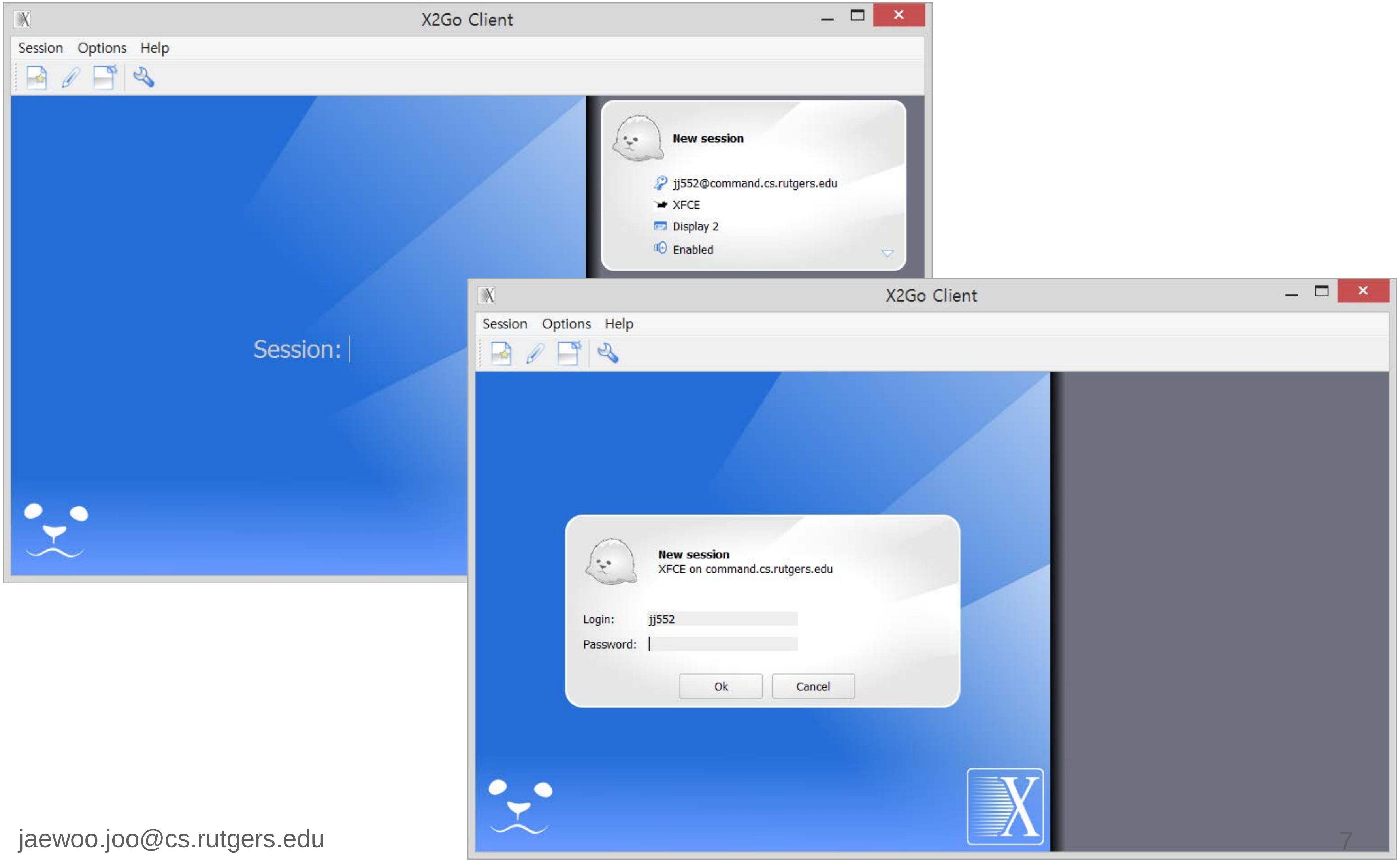
Command:

Put any iLab machine name from http://ilab.cs.rutgers.edu/~watrous/dcs-ilab-profile.html

Your netID

Select one of XFCE, MATE, KDE

How to use iLab Machine (Using X2go)



New session

jj552@command.cs.rutgers.edu

XFCE

Display 2

Enabled

Session:

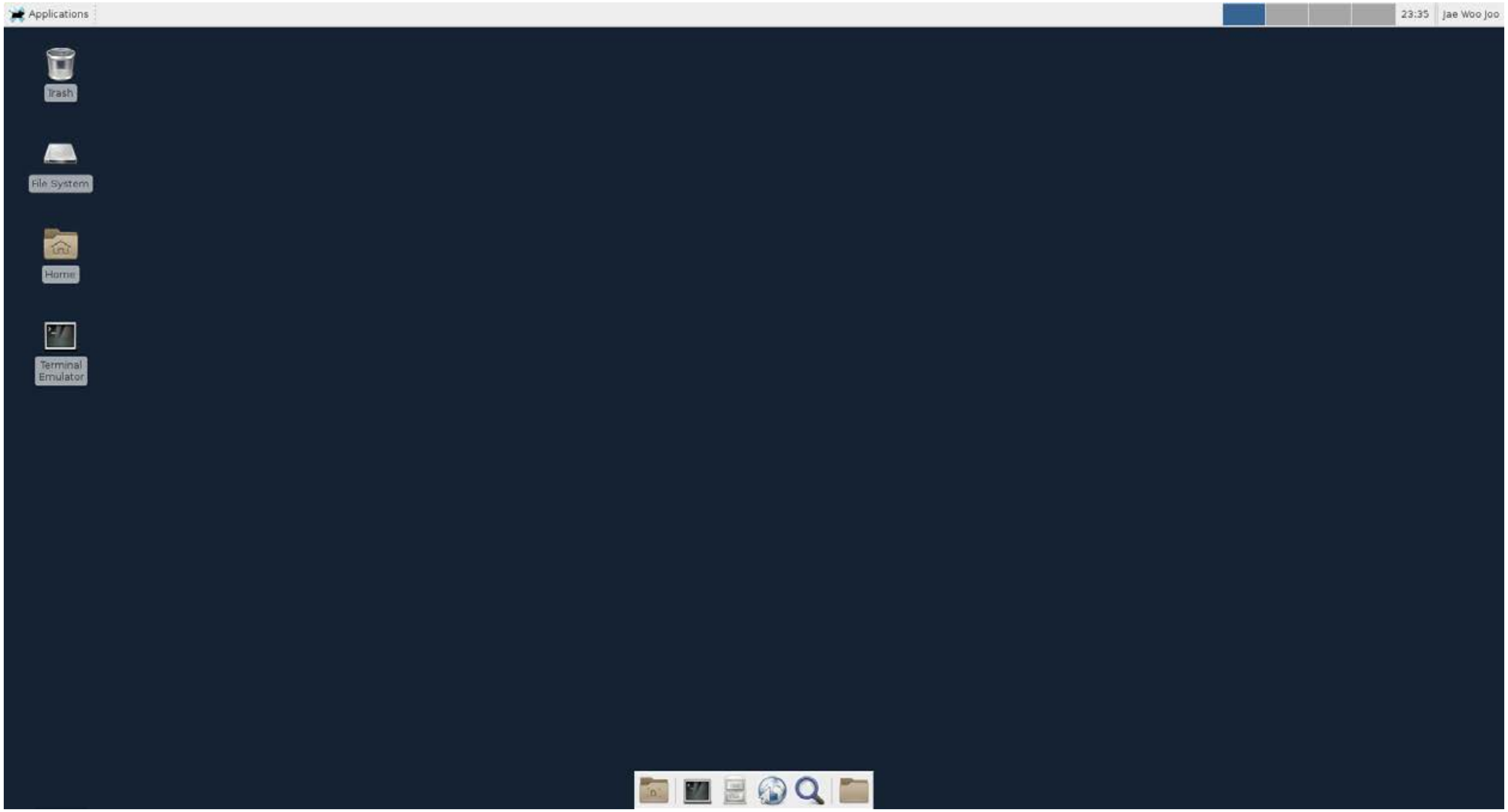
New session
XFCE on command.cs.rutgers.edu

Login: jj552

Password:

How to use iLab Machine (Using X2go)

- You are connected to iLab machine



Basic instruction in Linux

- **cd** : change directory
  - Ex) cd /home -> change the current working directory to /home
- **cd ..** : move to the parent directory
- **cp myfile yourfile** : copy “myfile” to the file “yourfile” in the cu rrent working directory
- **ls** : list files
- **mv** : move or rename files
- **pwd** : show the name of the current working directory
- **grep** : search texts in files
- **mkdir** : make directory
- **rm** : remove file

Linux text editors

- Vi / Vim
- gedit
- Nano editor
- Emacs
- …

How to use Vi / Vim

- vim [FILENAME]
  - Creates the file “FILENAME”

- Then you can use the editor

Basic commands in Vi / Vim

- Moving through the text
  - **h** : to move the cursor to the left
  - **l** : to move the cursor to the right
  - **k** : to move up
  - **j** : to move down
- Commands that switch the editor to insert mode
  - **i** : to insert text
  - **o** : to insert a blank line under the current cursor position and move the cursor to that line
  - **Esc** : switches back to command mode

Basic commands in Vi / Vim

- Basic operations
  - **:n** : moves to line n of the file
  - **:w** : will save (write) the file
  - **:q** : will exit the editor
  - **:q!** : forces the exit when you want to quit a file containing unsaved changes
  - **:wq** : will save and exit
  - **:w newfile** : will save the text to “newfile”
  - **:wq!** : overrides read-only permission
  - **/** : will perform the same search again, moving the cursor to the next match

Basic commands in Vi / Vim

- Basic operations
  - **n dd** : will delete n lines starting from the current cursor position
  - **n dw** : will delete n words at the right side of the cursor
  - **x** : will delete the character on which the cursor is positioned
  - **yy** : will copy a block of text
  - **n p** : will paste it n times

C programming

- The **printf()** function
  - **int printf(char *format, args)** : Write output to standard output under control of the format string
  - It is a print function that formats data and sends it to the standard system display device
  - Similar to **Systems.out.print()** in JAVA
  - Ex) printf(“Hello world! \n”);

C programming

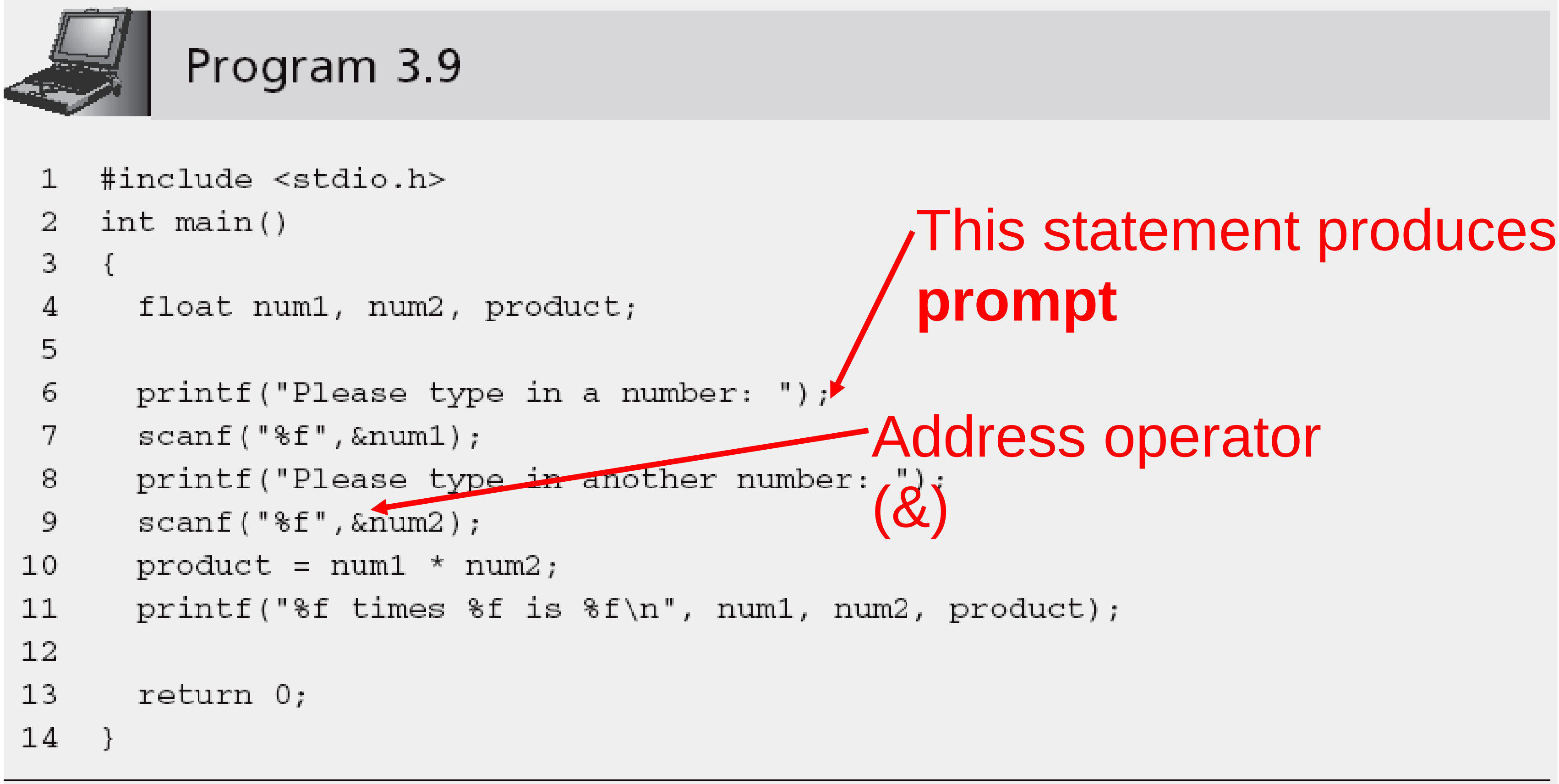
- The **scanf()** function
  - **int scanf(char *format, &args)** : Read from standard input under contr ol of the format string
  - It is used to enter data into a program while it is executing
  - Similar to **Scanner** in JAVA
  - Ex) int num; …

    scanf(“%d”, &num);

C programming

- printf() and scanf() format specifiers
  - Int : %d
  - Char : %c
  - Float : %f
  - Double : %lf
  - String : %s
  - Hexadecimal : %x

C programming



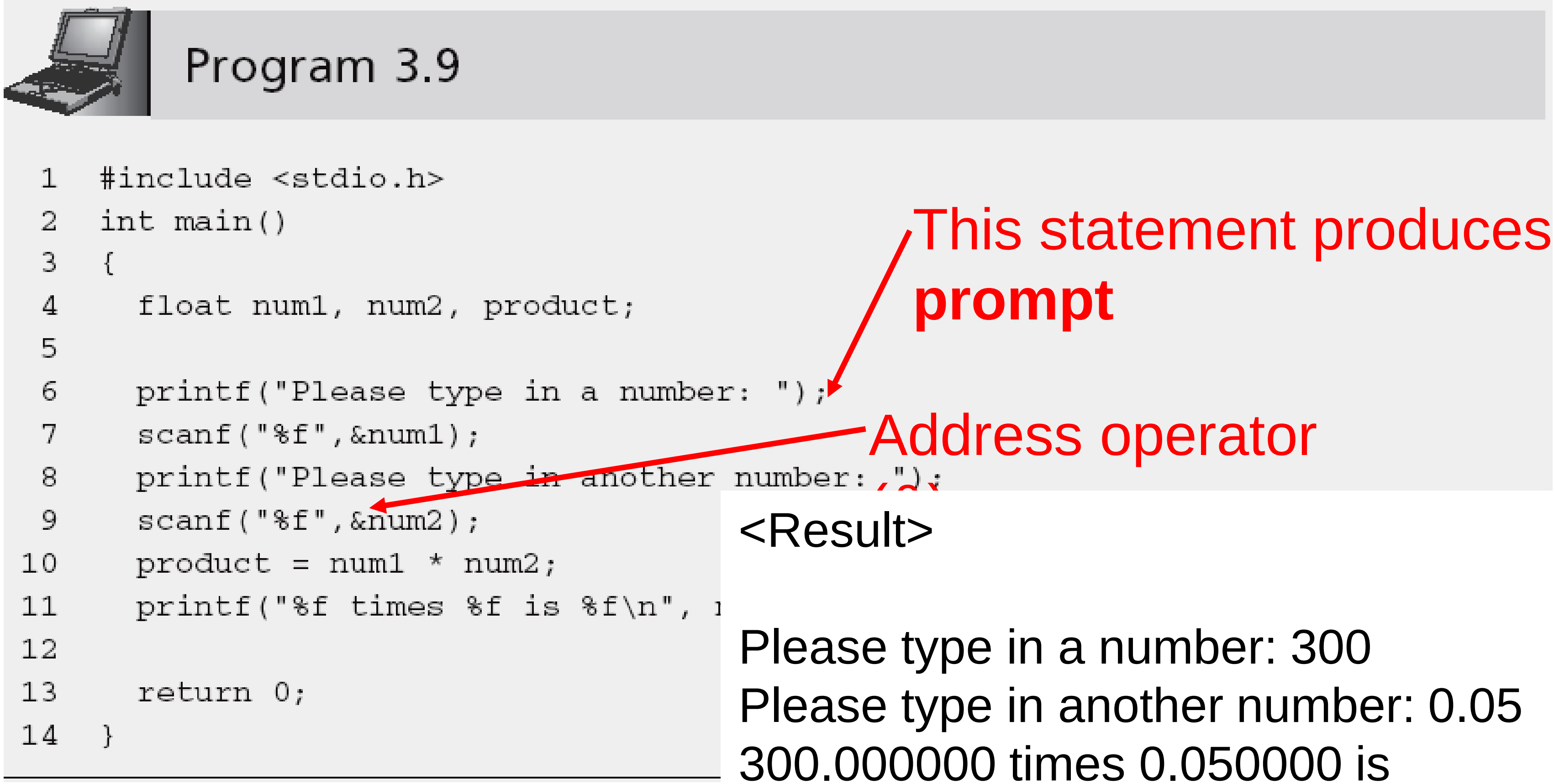
Program 3.9

```
#include <stdio.h>
int main()
{
  float num1, num2, product;

  printf("Please type in a number: ");
  scanf("%f",&num1);
  printf("Please type in another number: ");
  scanf("%f",&num2);
  product = num1 * num2;
  printf("%f times %f is %f\n", num1, num2, product);

  return 0;
}
```

This statement produces a **prompt**

Address operator (&)

C programming



Program 3.9

```
#include <stdio.h>
int main()
{
  float num1, num2, product;

  printf("Please type in a number: ");
  scanf("%f",&num1);
  printf("Please type in another number: ");
  scanf("%f",&num2);
  product = num1 * num2;
  printf("%f times %f is %f\n", n

  return 0;
}
```

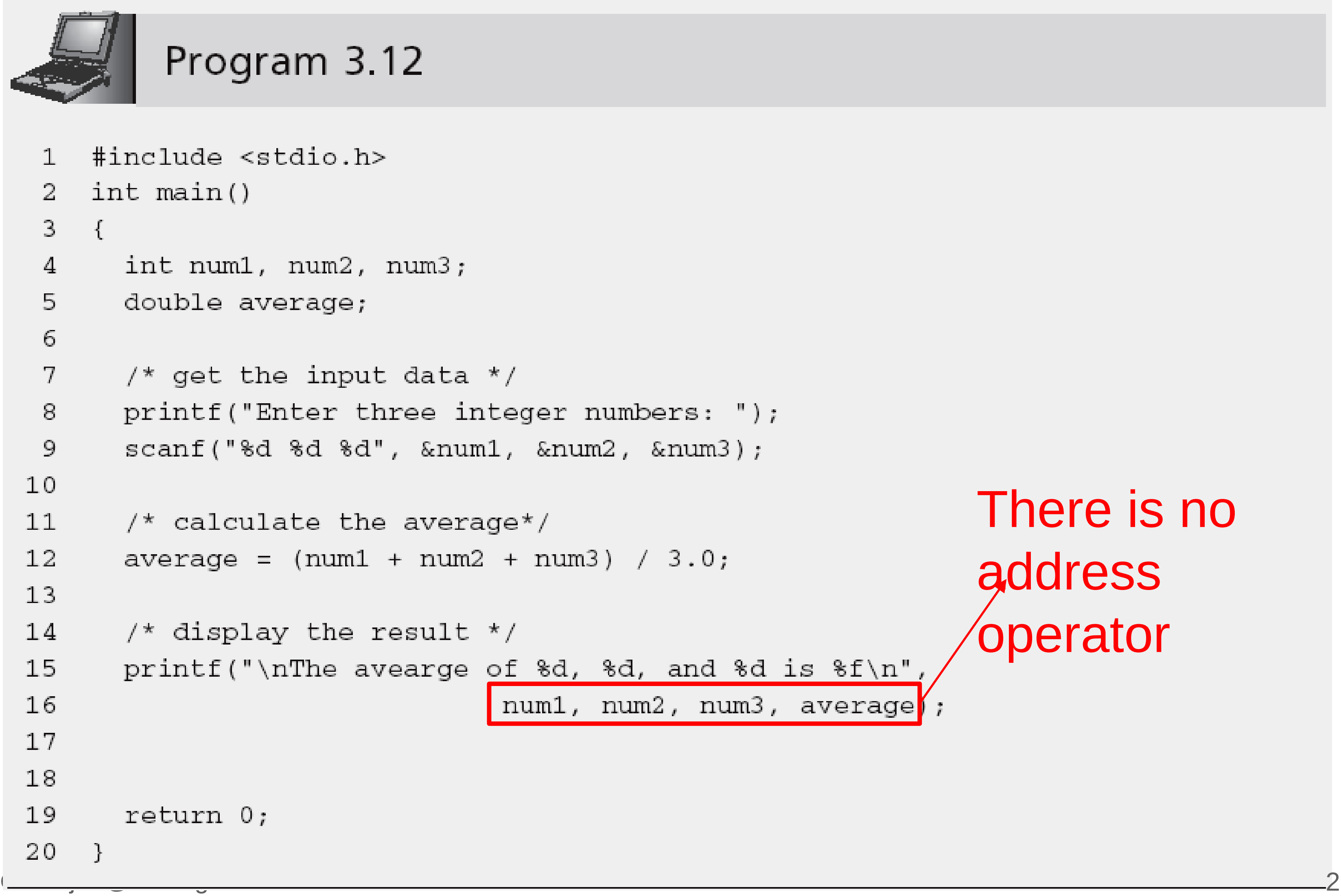
This statement produces a **prompt**

Address operator

<Result>

```
Please type in a number: 300
Please type in another number: 0.05
300.000000 times 0.050000 is
15.000000
```

C programming

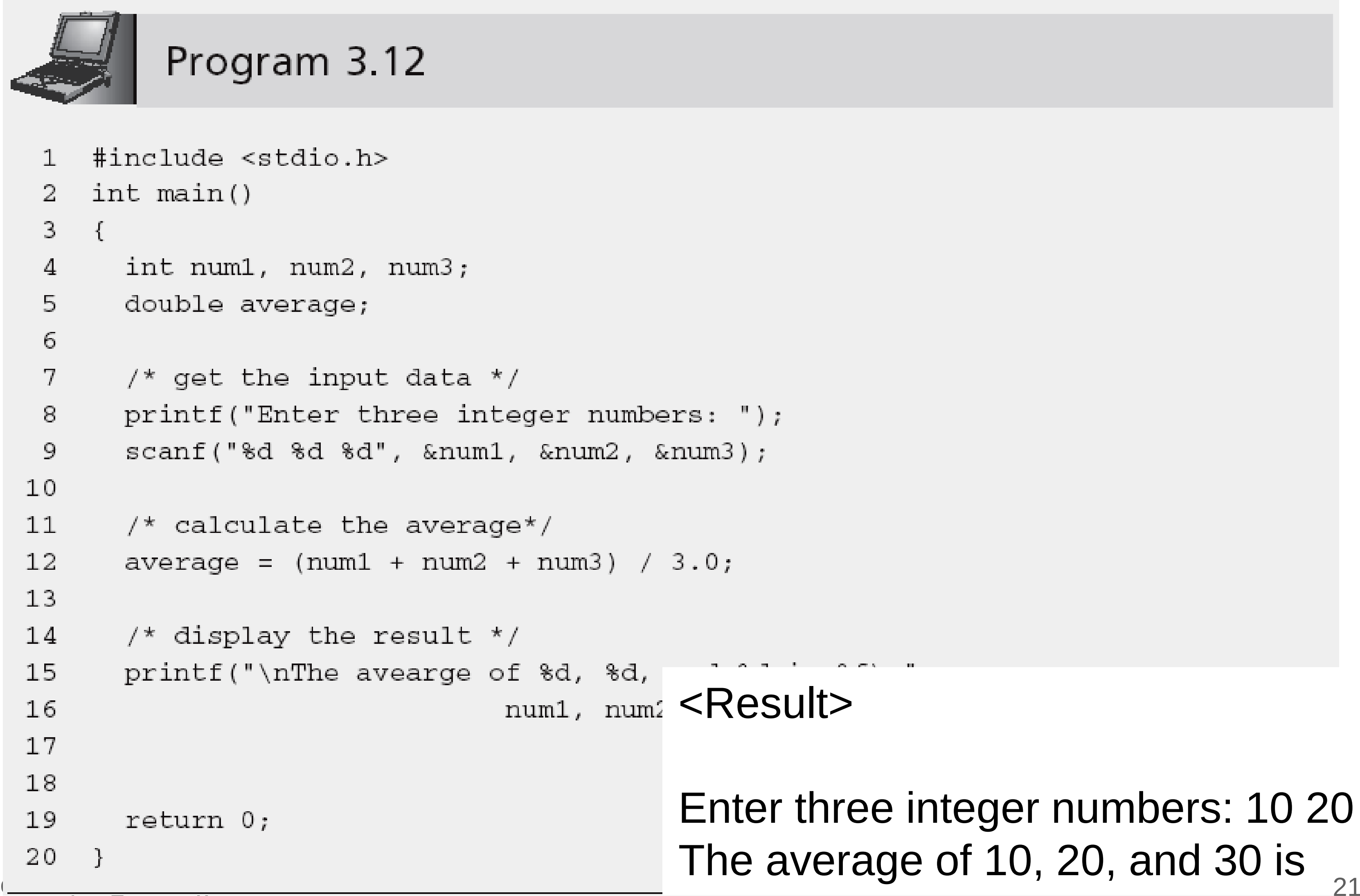


Program 3.12

```
#include <stdio.h>
int main()
{
  int num1, num2, num3;
  double average;

  /* get the input data */
  printf("Enter three integer numbers: ");
  scanf("%d %d %d", &num1, &num2, &num3);

  /* calculate the average*/
  average = (num1 + num2 + num3) / 3.0;

  /* display the result */
  printf("\nThe avearge of %d, %d, and %d is %f\n",
                         num1, num2, num3, average);


  return 0;
}
```

There is no address operator

C programming



Program 3.12

```
#include <stdio.h>
int main()
{
  int num1, num2, num3;
  double average;

  /* get the input data */
  printf("Enter three integer numbers: ");
  scanf("%d %d %d", &num1, &num2, &num3);

  /* calculate the average*/
  average = (num1 + num2 + num3) / 3.0;

  /* display the result */
  printf("\nThe avearge of %d, %d,
                          num1, num2


  return 0;
}
```

<Result>

```
Enter three integer numbers: 10 20 30
The average of 10, 20, and 30 is
20.000000
```

C programming

```
#include <stdio.h>
int main() {
        int integer;
        float num;
        char str[100];

        printf(“Enter an integer: “);
        scanf(“%d”, &integer);
        printf(“Enter a floating number: “);
        scanf(“%f”, &num);
        printf(“Enter a string: “);
        scanf(“%s”, &str);

        return 0;
}
```

C programming

```
#include <stdio.h>
int main() {
        int integer;
        float num;
        char str[100];

        printf(“Enter an integer: “);
        scanf(“%d”, &integer);
        printf(“Enter a floating number: “);
        scanf(“%f”, &num);
        printf(“Enter a string: “);
        scanf(“%s”, &str);

        return 0;
}
```

<Result>

```
Enter an integer: 211
Enter a floating number: 4.5
Enter a string: Hello world!
```

How to compile C in linux

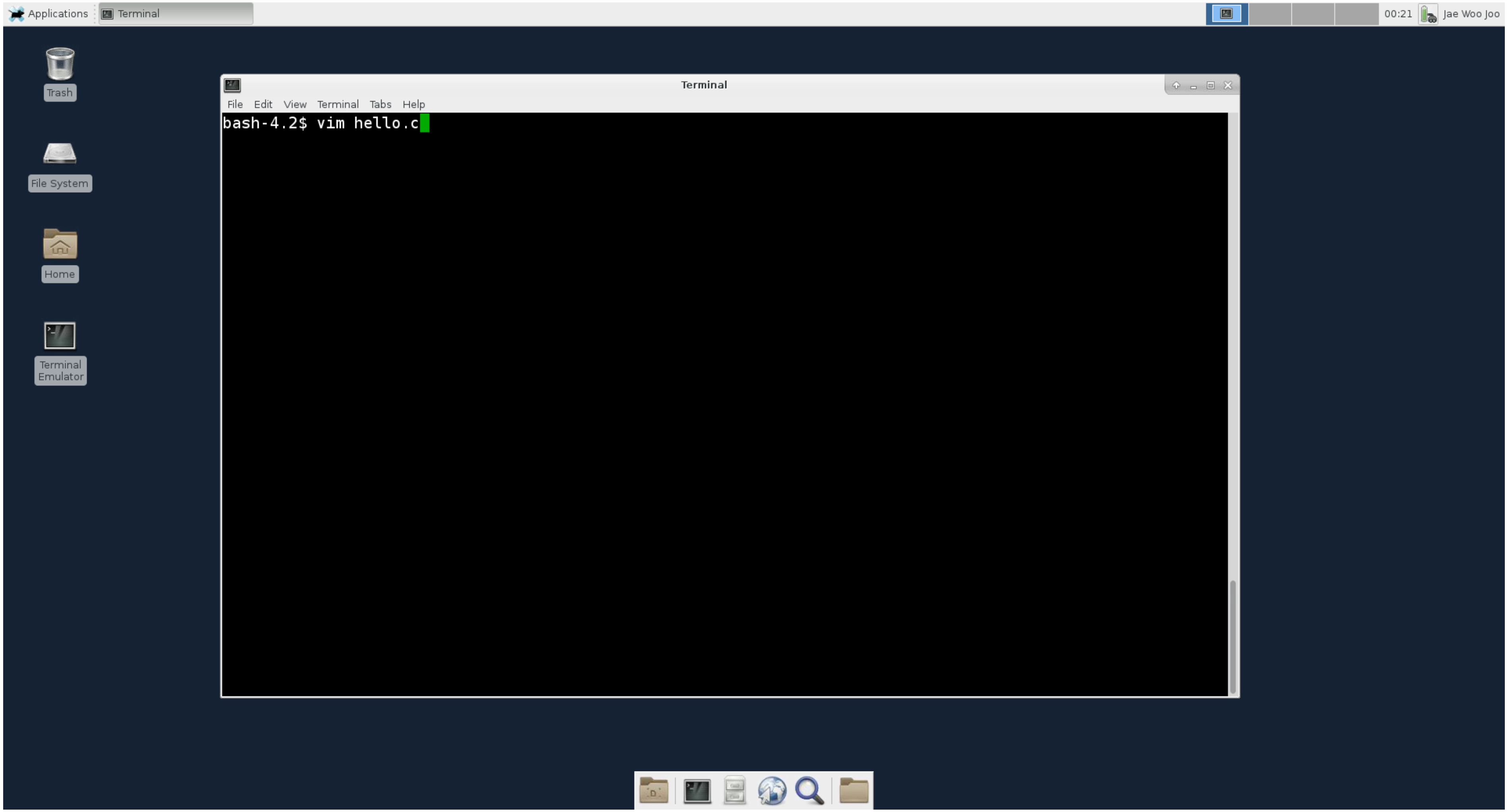
- GCC
  - GNU Compiler Collection
  - gcc is a compiler that can compile C, C++, JAVA, Fortran, …
  - Most widely used for compiling program
  - We use gcc to compile C in Linux

How to compile C in linux

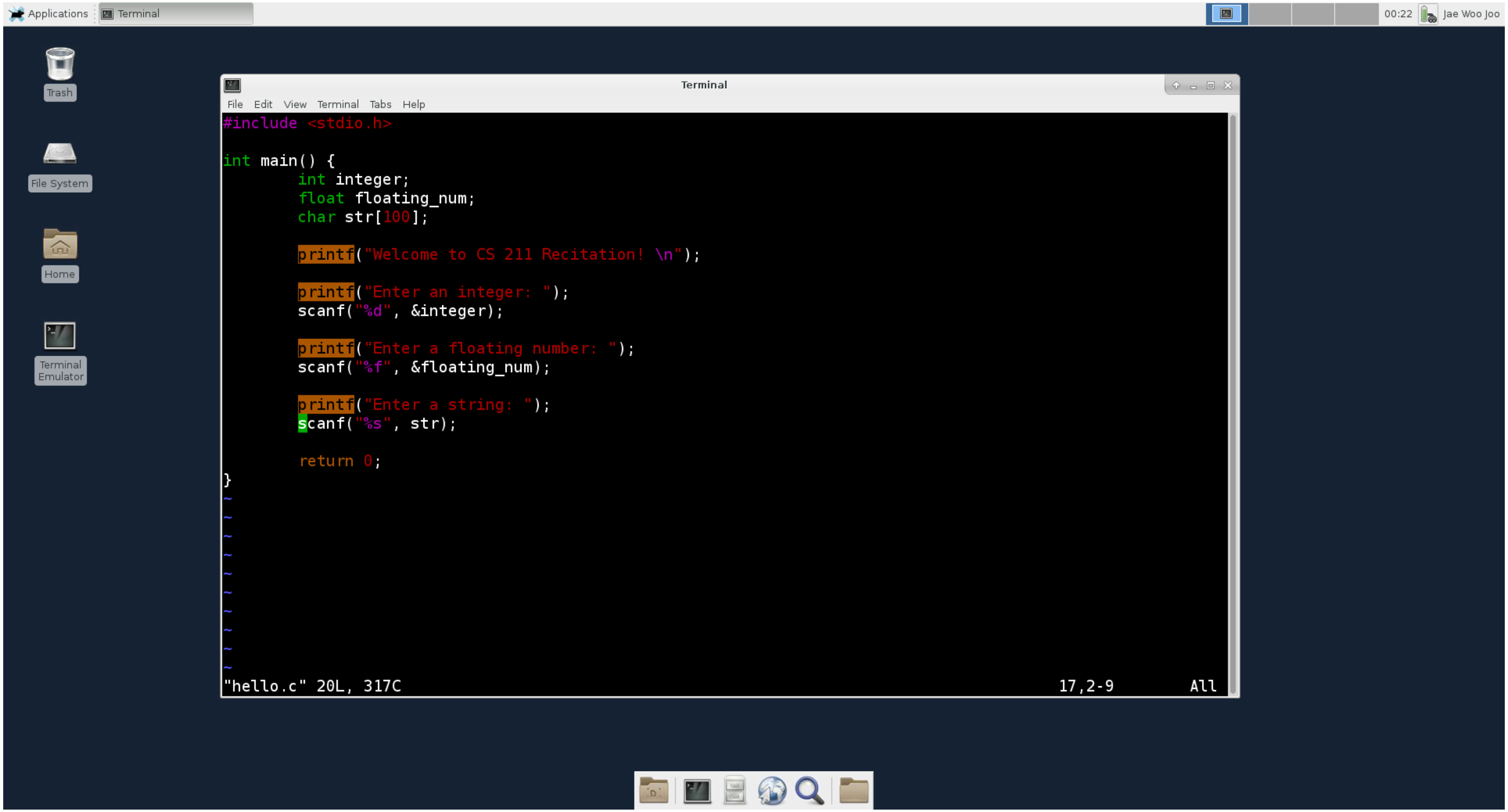
- This is the format that we will use for assignments

- gcc –Wall –Werror –fsanitize=address [compile file] –o [output file]
  - Ex) gcc –Wall –Werror –fsanitize=address hello.c –o hello

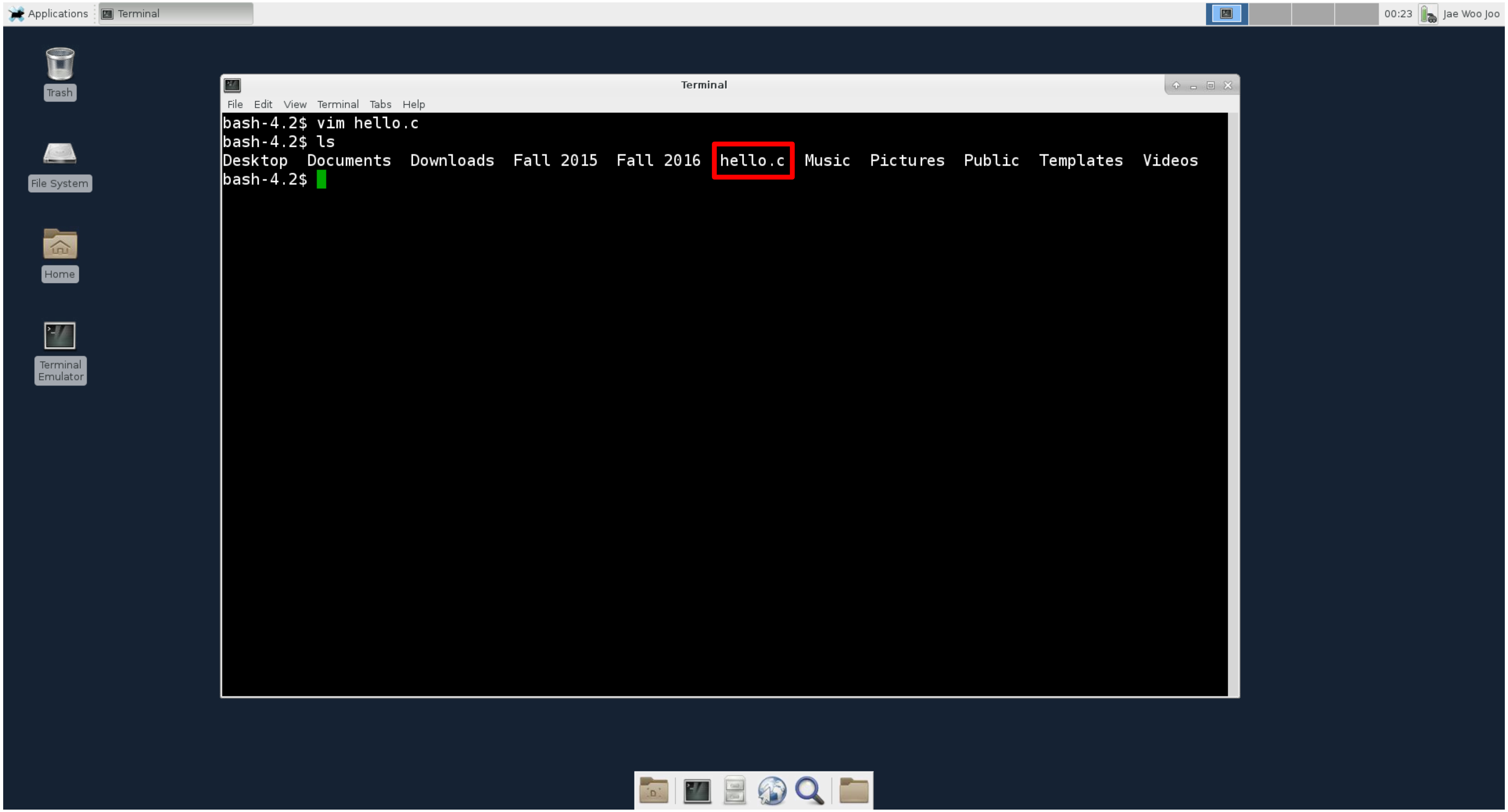
- ./[output file]
  - Ex) ./hello



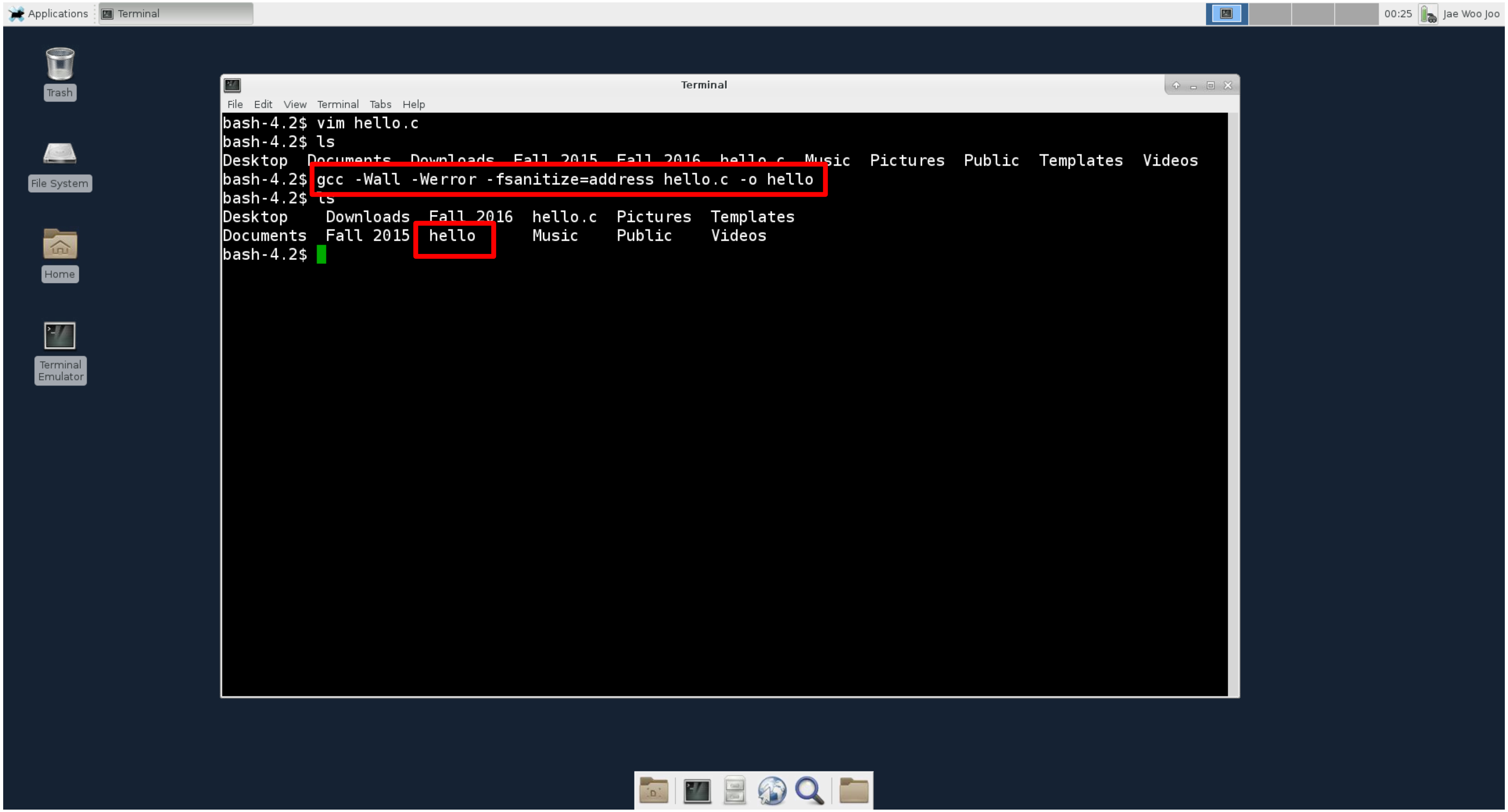
```
bash-4.2$ vim hello.c
```



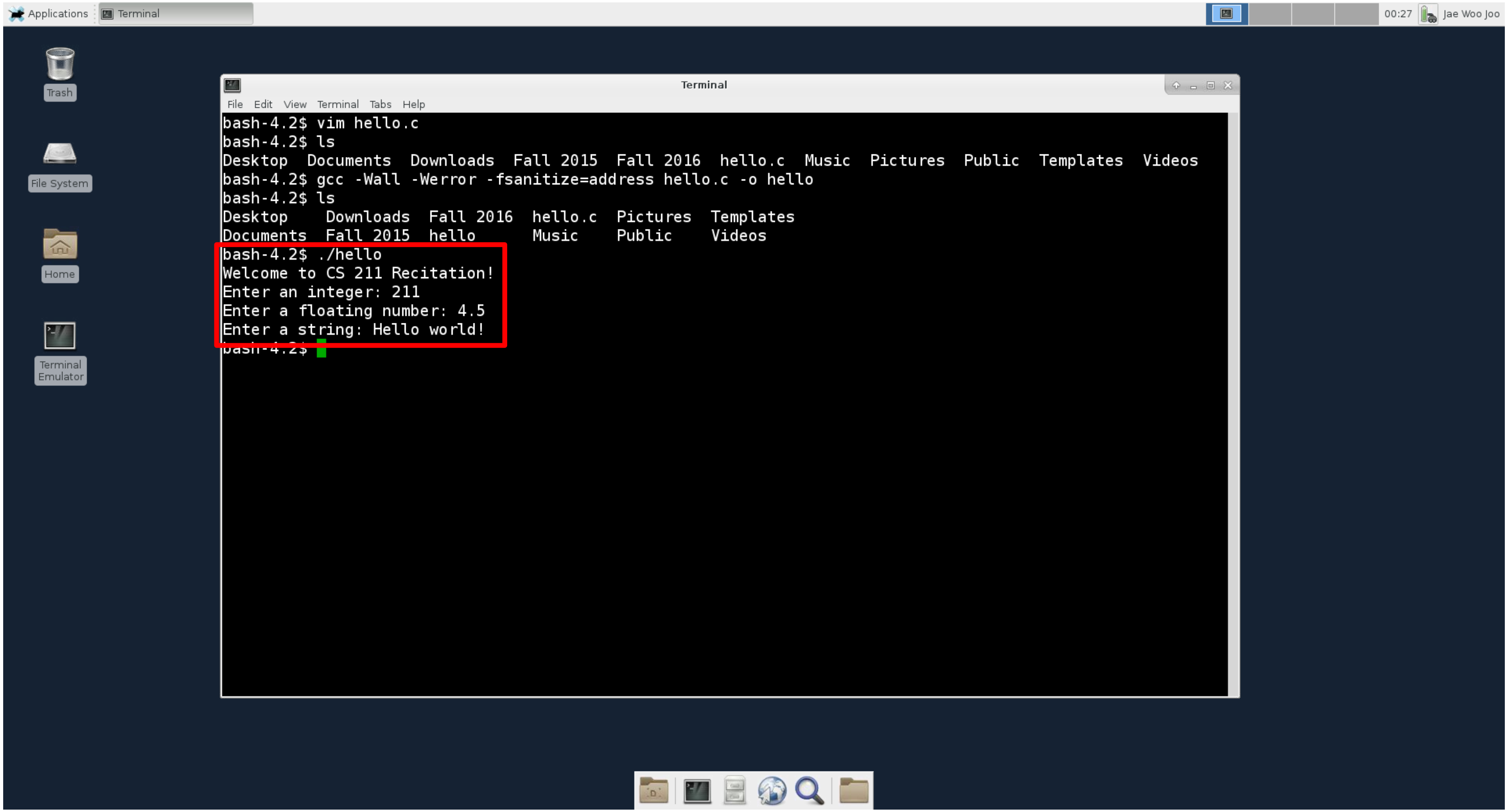
```
#include <stdio.h>

int main() {
        int integer;
        float floating_num;
        char str[100];

        printf("Welcome to CS 211 Recitation! \n");

        printf("Enter an integer: ");
        scanf("%d", &integer);

        printf("Enter a floating number: ");
        scanf("%f", &floating_num);

        printf("Enter a string: ");
        scanf("%s", str);

        return 0;
}
~
~
~
~
~
~
~
~
~
~
"hello.c" 20L, 317C                                           17,2-9        All
```



```
bash-4.2$ vim hello.c
bash-4.2$ ls
Desktop  Documents  Downloads  Fall 2015  Fall 2016  hello.c  Music  Pictures  Public  Templates  Videos
bash-4.2$ 
```



```
bash-4.2$ vim hello.c
bash-4.2$ ls
Desktop  Documents  Downloads  Fall 2015  Fall 2016  hello.c  Music  Pictures  Public  Templates  Videos
bash-4.2$ gcc -Wall -Werror -fsanitize=address hello.c -o hello
bash-4.2$ ls
Desktop    Downloads  Fall 2016  hello.c  Pictures  Templates
Documents  Fall 2015  hello      Music    Public    Videos
bash-4.2$
```



```
bash-4.2$ vim hello.c
bash-4.2$ ls
Desktop  Documents  Downloads  Fall 2015  Fall 2016  hello.c  Music  Pictures  Public  Templates  Videos
bash-4.2$ gcc -Wall -Werror -fsanitize=address hello.c -o hello
bash-4.2$ ls
Desktop    Downloads  Fall 2016  hello.c  Pictures  Templates
Documents  Fall 2015  hello      Music    Public    Videos
bash-4.2$ ./hello
Welcome to CS 211 Recitation!
Enter an integer: 211
Enter a floating number: 4.5
Enter a string: Hello world!
bash-4.2$ 
```

Q&A

- Any questions?