# Setting up C Programming Environment

# Before you start ...

- Please note that this is "NOT" a required part of the course and is not a homework.
- This manual is written for someone who has never programmed / never used Linux before.
   If you have background knowledge, you can ignore this.
- If you have any questions, please email
   Yoonji Shin <u>ys2476@columbia.edu</u>
- Oon't be scared, programming is fun! Enjoy :)

# Install VirtualBox

I.Visit <u>http://www.virtualbox.org/wiki/downloads</u>

Download VirtualBox platform packages for your OS
 Open the Installation Package by double clicking

### MAC



PC



# Install VirtualBox

### 4. Click continue and finish installing VirtualBox



### 5. When finished installation, close the window.

# **Download Linux**

- I.Visit the page <a href="http://www.ubuntu.com/download/ubuntu/download">http://www.ubuntu.com/download/ubuntu/download</a>
- 2. Choose the Latest version of Ubuntu and 32-bit and click "Start Download"

vnload	Windows Installer Alternative downl	oads CDs Upgrade 下载 Ubuntu	
1	Download Ubuntu	1	CL
	Click the big orange button to download the latest version of	Download options	
	Ubuntu. You will need to create a CD or USB stick to install Ubuntu.	Ubuntu 11.04 - Latest version     \$       32-bit (recommended)     \$	Download started
	Our long-term support (LTS) releases are supported for three years on the desktop. Perfect for organisations that need more stability for larger deployments.		32-bit Direct url for this download
	Additional options	If you're running Windows	Other ways to get Ubuntu
	Take a look at a full list of our	You can use Ubuntu Windows installer to run Ubuntu alongside your current system.	Order CDs >
	previous versions and alternative downloads >	Ubuntu Windows Installer >	Ubuntu Server>

I. Run VirtualBox by double-clicking the icon

2. Click "New" button on the top left corner

MAC	PC
Vertical Box Manager         Vertical State         Vertical State         Discard	Cracle VM VirtualBox Manager       Image: Comparison of the second

3. Click "Continue" on the pop-up window

4. Type VM name, select "Linux" for the OS and choose "Ubuntu" for the version.

MAC		PC
000	Create New Virtual Machine	Create New Virtual Machine
	VM Name and OS Type         Image: System you plan to install onto the virtual machine.         The name of the virtual machine usually indicates its software and hardware configuration. It will be used by all VirtualBox components to identify your virtual machine.         Image: Imag	VM Name and OS Type         Enter a name for the new virtual machine and select the type of the guest operating system you plan to install onto the virtual machine.         The name of the virtual machine usually indicates its software and hardware configuration. It will be used by all virtualBox components to identify your virtual machine.         Name         Ubuntu         OS Type         Operating System:         Linux         Version:         Ubuntu         Version:         Ubuntu         Cancel

5. Choose the amount of memory to allocate (I suggest choosing between 512 MB to 1024 MB)

6. Click Continue or Next

MAC		PC
000	Create New Virtual Machine	Create New Virtual Machine
	Sector the amount of base memory (RAM) in megabytes to be allocated to the circual machine.   The recommended base memory size is 512 MB.   Base Memory Size   4 MB   3584 MB	Memory         Select the amount of base memory (RAM) in megabytes to be allocated to the virtual machine.         The recommended base memory size is 512 MB.         Base Memory Size         Image: Comparison of the second state o
	Go Back Continu	Next Cancel

### 7. Choose create a new virtual hard disk

### 8. Click Continue or Next

PC
Create New Virtual Machine
Virtual Hard Disk         If you wish you can now add a start-up disk to the new machine. You can either create a new virtual disk or select one from the list or from another location using the folder icon.         If you need a more complex virtual disk setup you can skip this step and make the changes to the machine settings one the machine is created.         If ercommended size of the start-up disk is 8.00 GB.         If greate new hard disk         Impty         Impty

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### 9. Choose VDI (VirtualBox Disk Image)

### 10. Click Continue or Next

### MAC

000	Create New Virtual Disk	2 ×
	Welcome to the virtual disk creation wizard	Create New Virtual Disk
	This wizard will help you to create a new virtual disk for your virtual machine. Use the Continue button to go to the next page of the wizard and the Go Back button to return to the previous page. You can also press Esc if you want to cancel the execution of this wizard. Plase choose the type of file that you would like to use for the new virtual disk. If you do not need to use it with other virtualization software you can leave this setting unchanged. File type OID (VirtualBox Disk Image) VHDK (Virtual Machine Disk) OHD (Virtual Hard Disk) Parallels	Welcome to the virtual disk creation wizard         This wizard will help you to create a new virtual disk for your virtual machine.         Use the Next button to go to the next page of the wizard and the Back button to return to the previous page. You can also press Cancel if you want to cancel the execution of this wizard.         Please choose the type of file that you would like to use for the new virtual disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.         File type <ul> <li>VDI (VirtualBox Disk Image)</li> <li>VMDK (Virtual Machine Disk)</li> <li>VHD (Virtual Hard Disk)</li> <li>Parallels</li> </ul>
	Go Back Continue	Next Cancel

PC

II. Choose "Dynamically Allocated" click continue. This way, the size of your Virtual Hard Disk will grow as you use.

MAC		PC
000	Create New Virtual Disk	2 ×
	Virtual disk storage details Please choose whether the new virtual disk file should be allocated as it is used or if it should be created fully allocated. A dynamically allocated virtual disk file will only use space on your physical hard disk as it fills up, although it will not shrink again automatically when space on it is freed. A fixed size virtual disk file may take longer to create on some systems but is often faster to use. Storage details Opnamically allocated Fixed size	Create New Virtual Disk Virtual disk storage details Please choose whether the new virtual disk file should be allocated as it is used or if it should be created fully allocated. A dynamically allocated virtual disk file will only use space on your physical hard disk as it fills up, although it will not shrink again automatically when space on it is freed. A fixed size virtual disk file may take longer to create on some systems but is often faster to use. Storage details Q pynamically allocated D Exect Size
	Go Back Continue	Next Cancel

- 12. Click the folder icon and choose the ubuntu iso file you downloaded.
- I 3. Select the size of the Virtual Disk (I recommend choosing 8 GB) and click continue

00	Create New Virtual Disk	2 ×
	Virtual disk file location and size	Create New Virtual Disk
	Image: Provide the state of the new virtual disk file into the box below or click on the folder icon to select a different folder to treate the file in.Image: Image: Image	Virtual disk file location and size         Please type the name of the new virtual disk file into the box below or dick on the folder icon to select a different folder to create the file in.         Location         Ubuntul         Select the size of the virtual disk in megabytes. This size will be reported to the Guest OS as the maximum size of this virtual disk.         Size         4.00 MB
	Go Back Continue	Next Cancel

### 14. Click Create

### MAC

Create New Virtual Disk	? ×
Summary	Create New Virtual Disk
You are going to create a new virtual disk with the following parameters: File type: VDI (VirtualBox Disk Image) Details: Dynamically allocated storage Location: /Users/yoonjishin/VirtualBox VMs/Ubuntu/Ubuntu.vdi Size: 8.00 GB (8589934592 B) If the above settings are correct, press the Create button. Once you press it the new virtual disk file will be created.	Summary You are going to create a new virtual disk with the following parameters: File type: VDI (VirtualBox Disk Image) Details: Dynamically allocated storage Location: C:\Users\Yoonji\VirtualBox VMs\Ubuntu\Ubuntu.vdi Size: 8.00 GB (8589934592 B) If the above settings are correct, press the <b>Create</b> button. Once you press it the new virtual disk file will be created.
Go Back Create	Create Cancel

PC

### I. Choose Ubuntu from left column and click Start

### MAC & PC



### 2. Click continue on pop-up window

PC

### MAC



# First Run Wizard Welcome to the First Run Wizard! You have started a newly created virtual machine for the first time. This wizard will help you to perform the steps necessary for installing an operating system of your choice onto this virtual machine. Use the Next button to go to the next page of the wizard and the Back button to return to the previous page. You can also press Cancel if you want to cancel the execution of this wizard. Next Cancel

3. Click the folder icon and choose the ubuntu iso file you downloaded and click continue and start

MAC		PC
000	First Run Wizard	
	Select Installation Media	🕒 💓 First Run Wizard
OR NO.	Select the media which contains the setup program of the operating system you want to install. This media must be bootable, otherwise the setup program will not be able to start. Media Source          ubuntu-11.04-desktop-i386.iso (685.29 MB)       Image: Comparison of the setup program will not be able to start.	Select Installation Media         Select the media which contains the setup program of the operating system you want to install. This media must be bootable, otherwise the setup program will not be able to start.         Media Source         Host Drive 'D:'         Host Drive 'D:'         Host Drive 'D:'         Host Drive 'D:'         Ubuntu -11.04-desktop-amd64.iso (698.20 MB)         VBoxGuestAdditions.iso (42.90 MB)         C:#Users#Yoonji#Downloads#ubuntu-11.04-desktop
	Go Back Continue	Next Cancel

### 4. Click Install Ubuntu



4. Check "Download updates" and click Forward



5. Choose "Erase disk and install Ubuntu" and click Forward (Don't worry, it won't wipe your computer)

000	Ubuntu [Running]	
		tµ •0) (Ů
	8 Install	
	Allocate drive space This computer currently has no detected operating systems.	
	What would you like to do?	
	Erase disk and install Ubuntu     Warning: This will delete any files on the disk	
	Something else You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.	
	Quit Back Forward	

# 6. Click "Install Now" and wait. Maybe grab a snack.7. When finished, click Restart and press Enter.

000	Ubuntu [Running]		
		ti e	D)) (D)
	S Install		
	Erase disk and install Ubuntu		
	Select drive: SCSI3 (0,0,0) (sda) - 8.6 GB ATA VBOX HARDDISK ‡		
	The entire disk will be used:		
	Ubuntu /dev/sda (ext4) 8.6 GB		
	Quit Back Install Now		
			oft ¥

### I. Open Terminal (Applications-Accessories-Terminal)



### Open gedit by typing "gedit &" on terminal (You can also use any other Text Editor application)



3. Type the following on gedit (or any other text editor)

```
#include<stdio.h>
main()
{
    printf("Hello World\n");
}
```

4. Save this file as "helloworld.c"



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5. Type "Is" on Terminal to see all files under current folder

- 6. Confirm that "helloworld.c" is in the current directory. If not, type cd DIRECTORY\_PATH to go to the directory that has "helloworld.c"
- 7. Type "gcc helloworld.c" to compile, and type "ls" to confirm that a new executable file "a.out" is created

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File Edit View Search Terminal Help	
yoonji@yoonji-VirtualBox:~\$ ls	
Desktop Downloads hellowor Documents examples.desktop Music	ld.c Pictures Templates Public Videos
<pre>yoonji@yoonji-VirtualBox:~\$ gcc hello yoonji@yoonji-VirtualBox:~\$ ls</pre>	world.c
a.out Documents examples.desktop Desktop Downloads helloworld.c yoonji@yoonji-VirtualBox:~\$	Music Public Videos Pictures Templates

8. Type "./a.out" on Terminal to run the program

- 9. If you see "Hello World" on the next line, you just successfully ran your first C program!
- 10.Try other codes from "A Shotgun Introduction to C" on professor Edwards's webpage.You can also find many C programing guides online. (just google it!) Enjoy :)

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File Edit View Search Terminal Help	)			
<pre>yoonji@yoonji-VirtualBox:~\$ ls Desktop Downloads hellowor Documents examples.desktop Music yoonji@yoonji-VirtualBox:~\$ gcc hello yoonji@yoonji-VirtualBox:~\$ ls</pre>	Publ	No. 10 You want to be a set of the	lates os	
a.out Documents examples.desktop Desktop Downloads helloworld.c voonji@voonji-VirtualBox:~\$ ./a.out Hello World yoonji@voonji-VirtualBox:~\$	Music Pictures	Public Templates	Videos	