

# CSCI1540 Fundamental Computing with C++

## Tutorial 3: command line interface

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SHB 1005

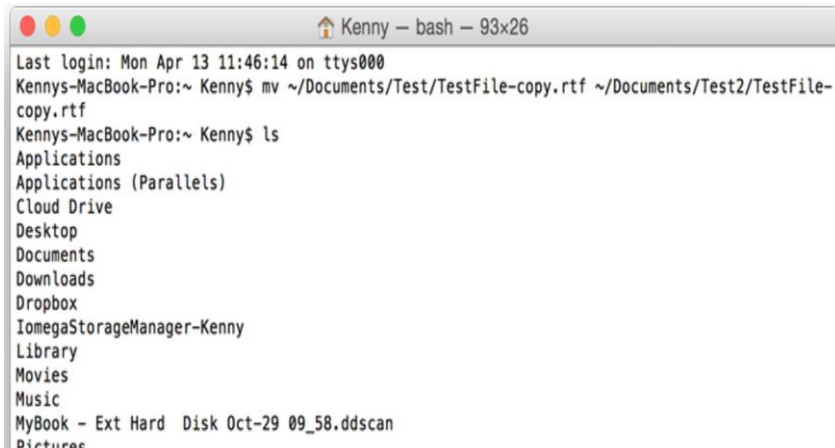
[xyhu@cse.cuhk.edu.hk](mailto:xyhu@cse.cuhk.edu.hk)

# Outline

- Command Line Interface
  - What is Command Line Interface (CLI) and Why
  - Set CLI via Visual Studio Community 2019
  - Some useful commands
  - Wildcard character “\*”

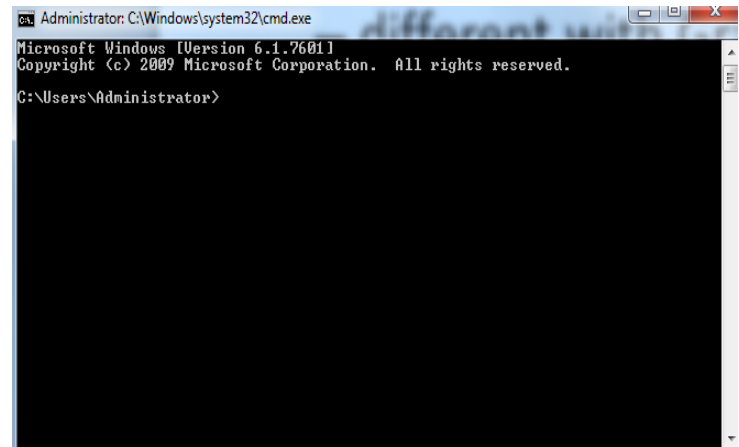
# Command Line Interface (CLI)

- Command Line Interface
  - a mechanism for interacting with a computer operating system or software by typing commands to perform specific tasks
  - different with Graphical User Interface (GUI)



```
Kenny — bash — 93x26
Last login: Mon Apr 13 11:46:14 on ttys000
Kennys-MacBook-Pro:~ Kenny$ mv ~/Documents/Test/TestFile-copy.rtf ~/Documents/Test2/TestFile-copy.rtf
Kennys-MacBook-Pro:~ Kenny$ ls
Applications
Applications (Parallels)
Cloud Drive
Desktop
Documents
Downloads
Dropbox
IomegaStorageManager-Kenny
Library
Movies
Music
MyBook - Ext Hard Disk Oct-29 09_58.ddscan
Pictures
```

CLI in Mac



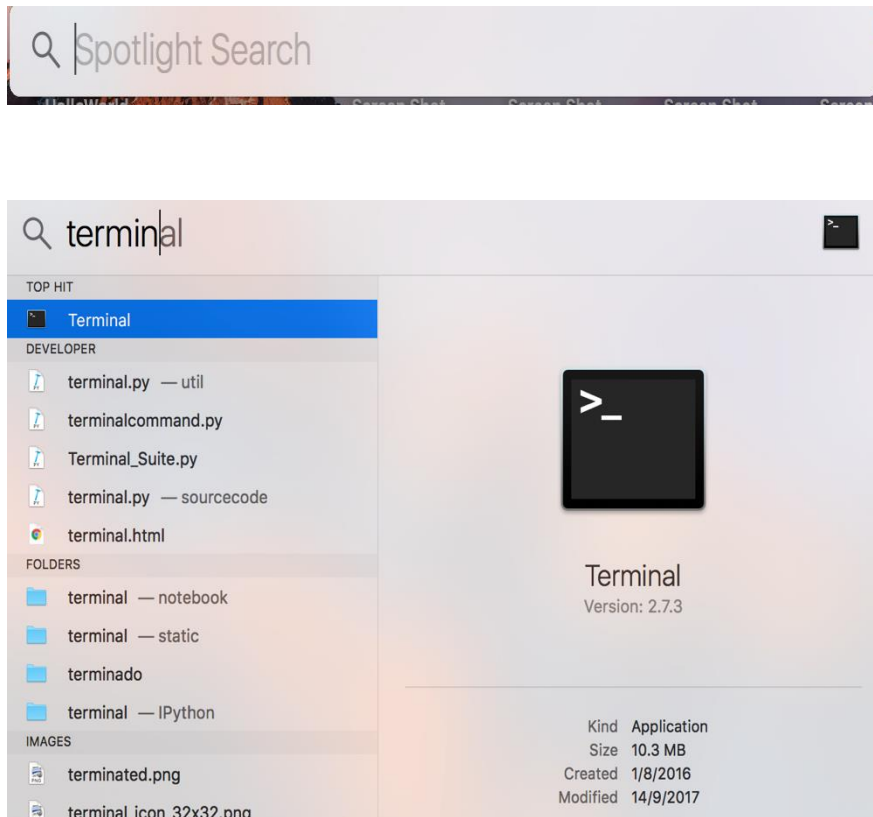
```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>
```

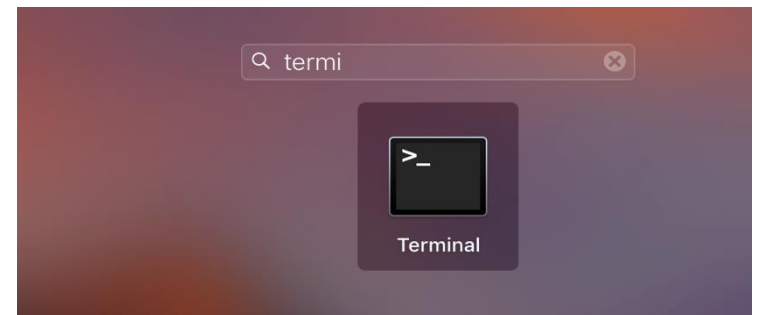
CLI in windows

# Open CLI in Mac

## Method 1:

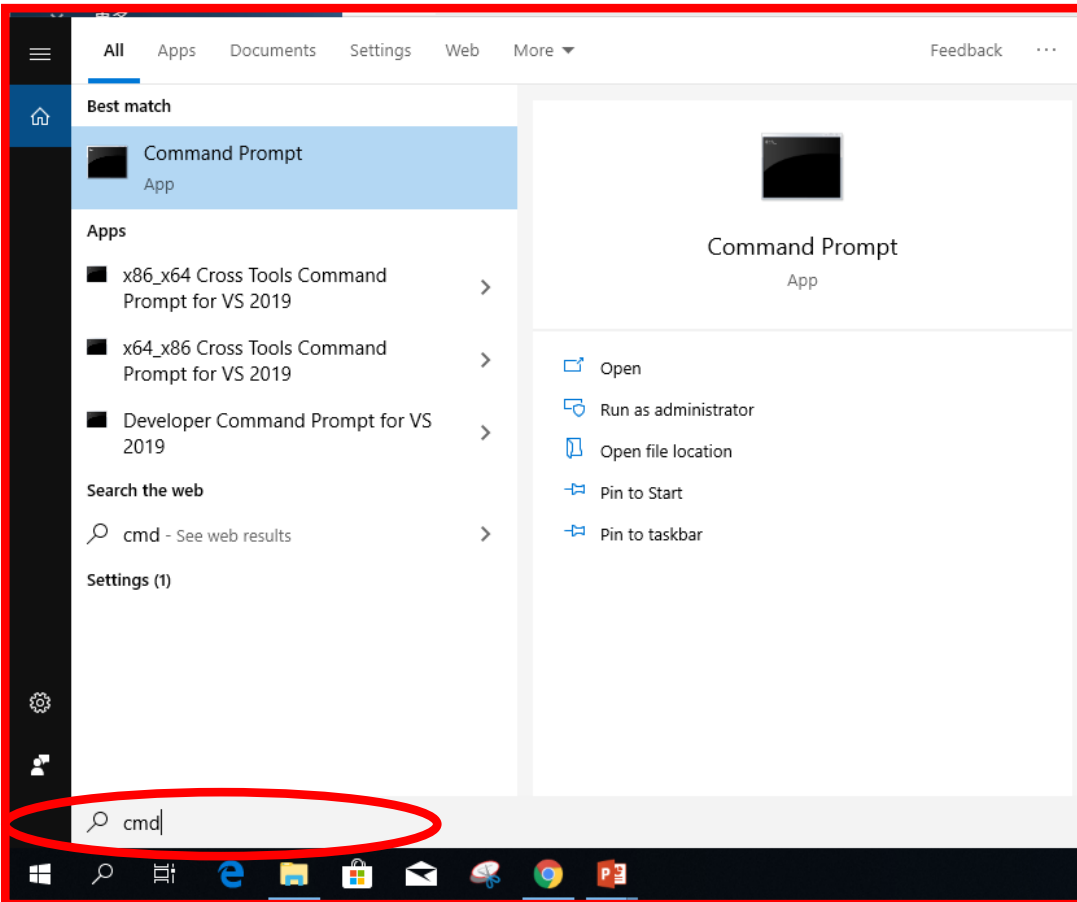


## Method 2:

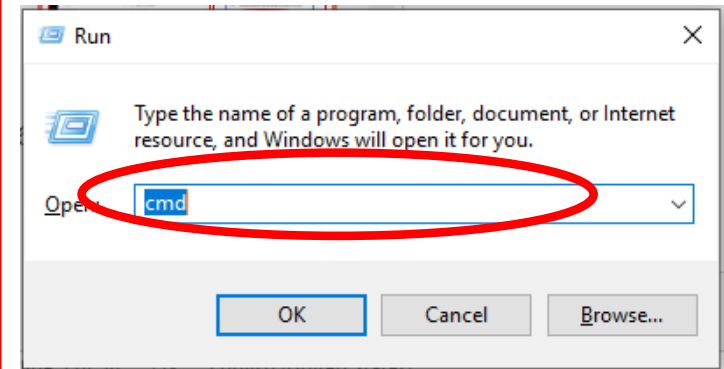


# Open CLI in Windows

Or

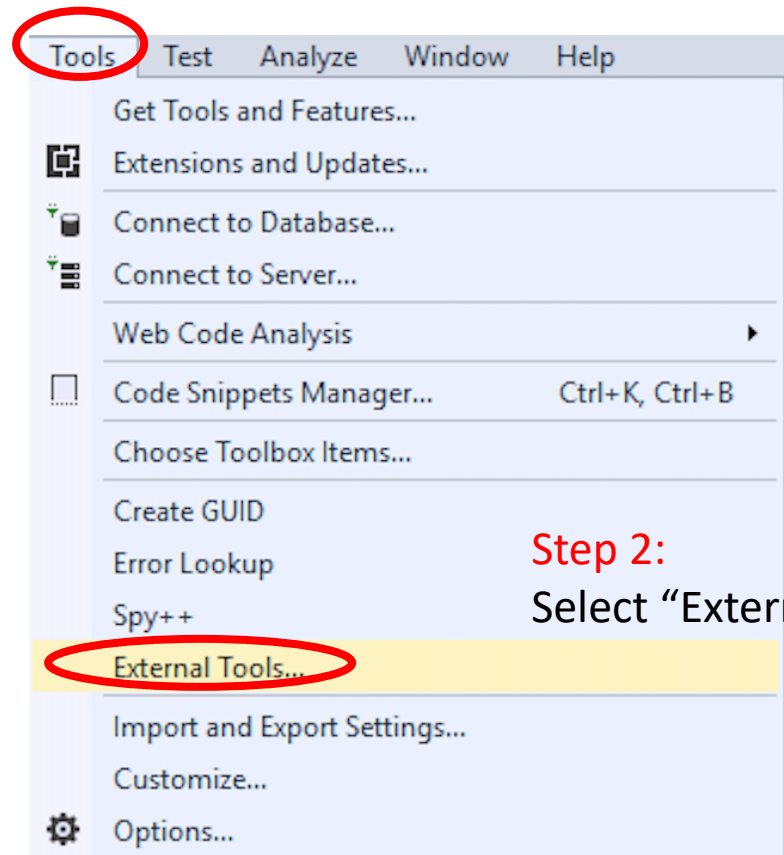


Press hot key “win + R”



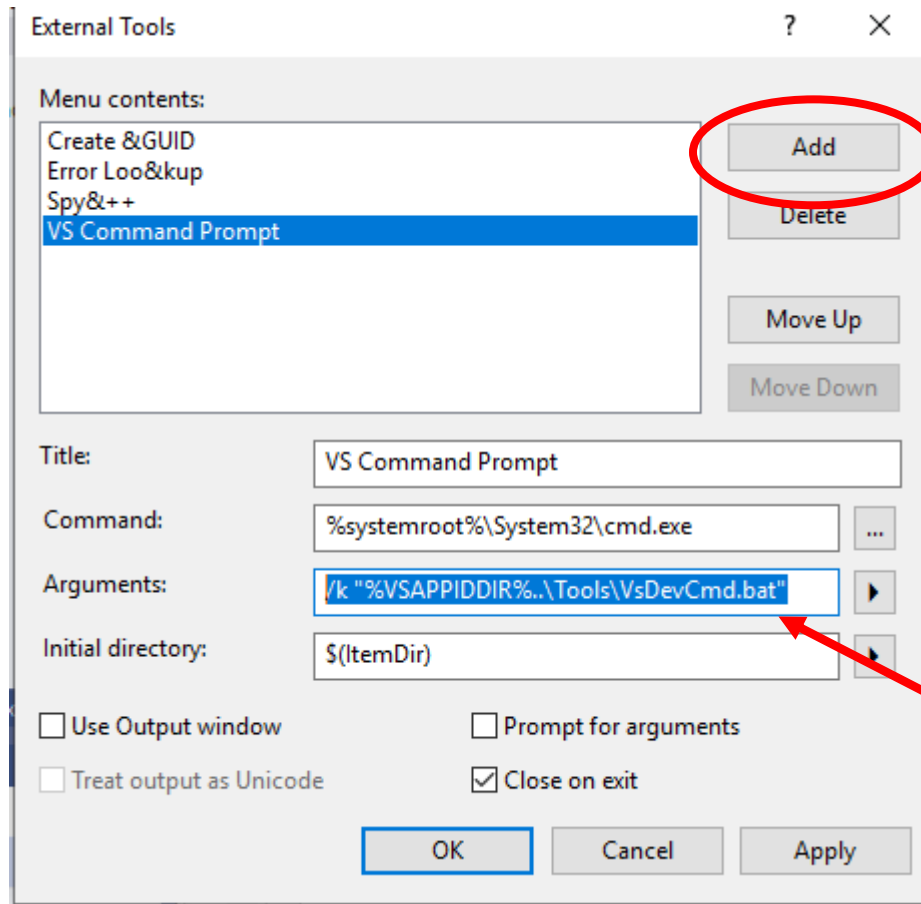
# Set CLI via Visual Studio Community 2019

Step 1:  
Select "TOOLS"



Step 2:  
Select "External Tools"

# Set CLI via Visual Studio Community 2019



Step 3: Select "Add"

Step 4: Enter "Title"

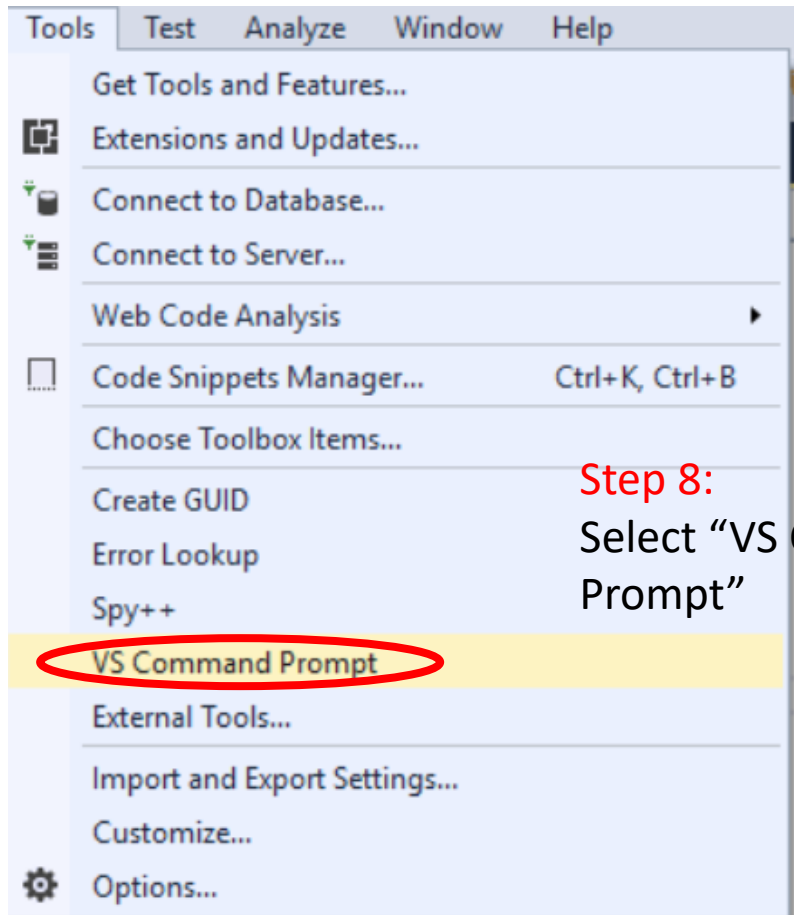
Step 5: Enter "Command"

Step 6: Enter "Arguments":

/k "%VSAPPIDIR%..\Tools\VsDevCmd.bat"

Step 7: Enter "Initial directory" as  
"\$(ItemDir)"

# Open CLI via Visual Studio 2019 Command Prompt

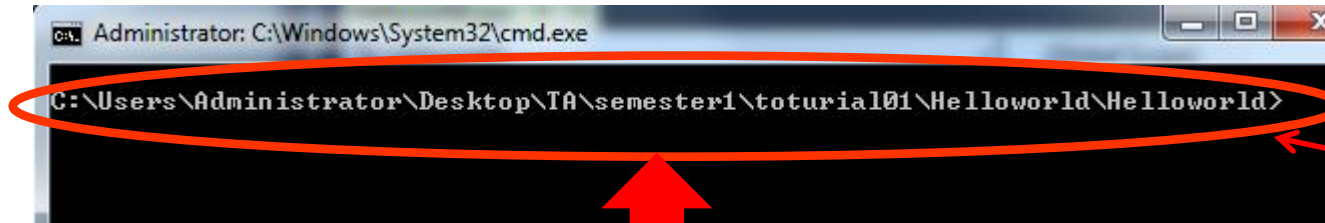


Step 8:  
Select "VS Command  
Prompt"



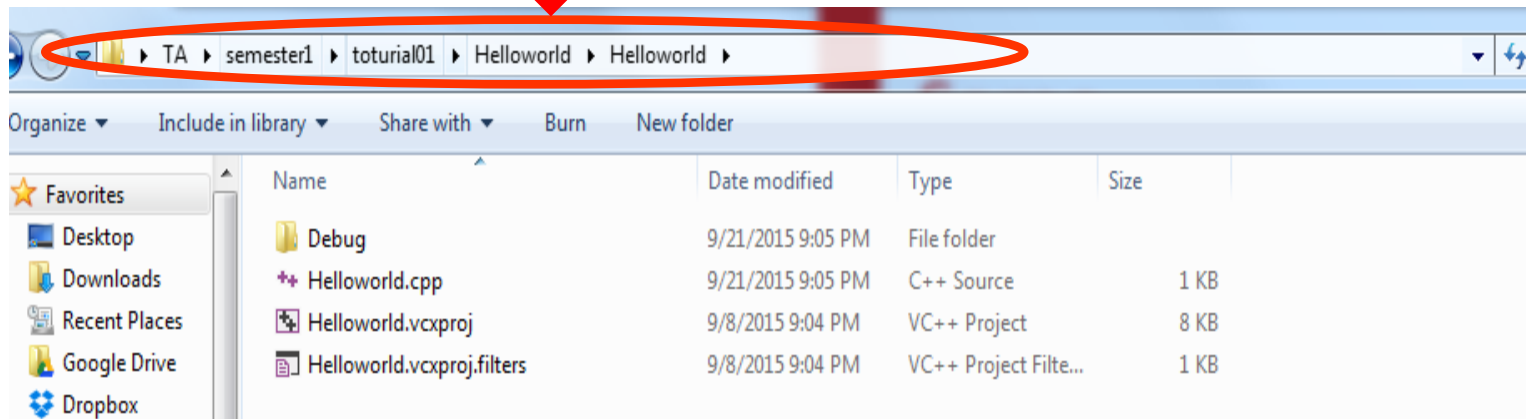
# Open CLI in Windows

- The window for the interface



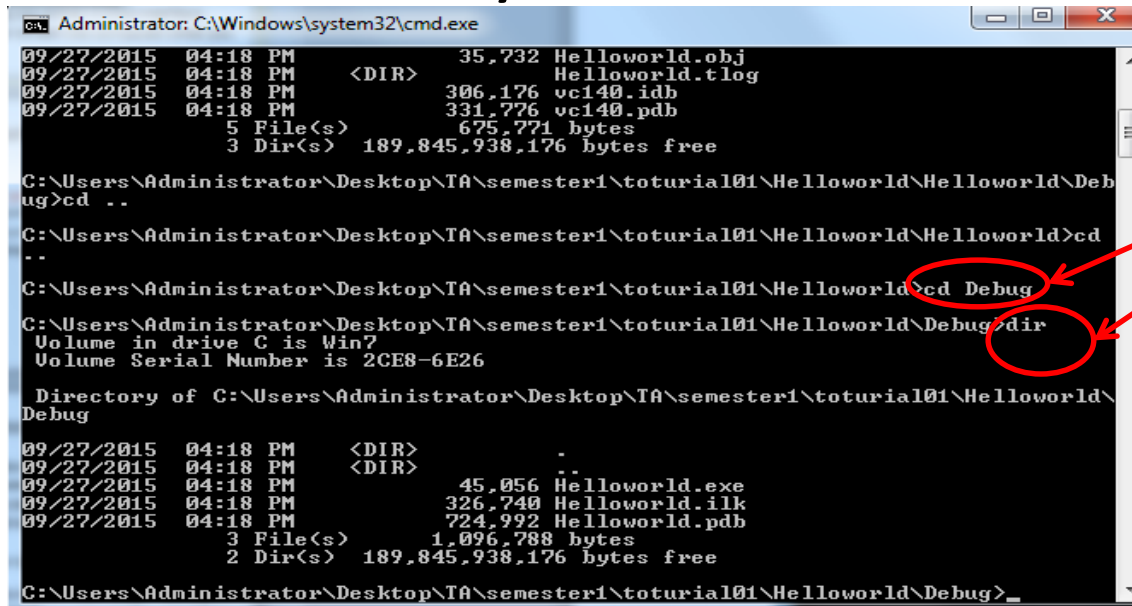
Your current  
working  
folder

Same



# Command examples

- Recall what you have learned in tutorial 1



```
Administrator: C:\Windows\system32\cmd.exe
09/27/2015 04:18 PM      35,732 Helloworld.obj
09/27/2015 04:18 PM      <DIR>      Helloworld.tlog
09/27/2015 04:18 PM      306,176 vc140.idb
09/27/2015 04:18 PM      331,776 vc140.pdb
          5 File(s)      675,771 bytes
          3 Dir(s)      189,845,938,176 bytes free

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld\Helloworld\Debug>cd ..

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld\Helloworld>cd ..

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld>cd Debug

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld\Debug>dir
Volume in drive C is Win7
Volume Serial Number is 2CE8-6E26

Directory of C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld\Debug

09/27/2015 04:18 PM      <DIR>      .
09/27/2015 04:18 PM      <DIR>      ..
09/27/2015 04:18 PM           45,056 Helloworld.exe
09/27/2015 04:18 PM        326,740 Helloworld.ilc
09/27/2015 04:18 PM        724,992 Helloworld.pdb
          3 File(s)      1,096,788 bytes
          2 Dir(s)      189,845,938,176 bytes free

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Helloworld\Debug>
```

Commands

Command: a **string** you enter in the interface

- An instruction to tell the computer what you want to do

# Command examples

For both Windows and Mac

- Command: cd
  - “cd” stands for “change directory”, where “directory” is a synonym of “folder”
  - It changes your current working **directory** only, while can *not* change drives (C:, D:, E: ...)

# Format of commands

- Command can be a string like “cd Debug”
  - Words are separated by spaces
- The **first** word is the application name (also called command name), e.g.,
  - “cd”
  - The name of your program “assg1” in assignment 1
- The **other** words in your input (e.g., “Debug”) are called arguments

# Some useful commands

Command	Usage
cd abc	Change the current working directory to “abc”
cd ..	Change the current working directory to the parent folder (Will be explained later)
dir (ls)	List the content of the current working directory
E:	Change the current working directory to disc E: (similar for C:, D: and etc)
exit	Quit the command line interface
cl /EHsc g++ -std=c++11	Compile a .cpp file in windows command line
FC (diff)	Compare files line by line

- The .exe file generated by C++ can also be a command, and you can execute the file by entering it
  - E.g., “Helloworld” in sample program

For both Windows and Mac

Only for Windows

Only for Mac

# Some useful commands (cont.)

Command	Usage
<code>copy(cp)</code>	Copy one or more files to another location
<code>del (rm)</code>	Delete one or more files
<code>cls(clear)</code>	Clear the screen
<code>type(cat)</code>	Display the contents of a text file
<code>ren(mv)</code>	Rename a file or files
<code>move(mv)</code>	Move files from one folder to another
<code>explorer . (open .)</code>	Open the current folder

A useful link to find the usage of the commands

<http://ss64.com/nt/>

Use "Ctrl+F" to find the keyword

For both Windows and  
Mac

Only for Windows

Only for Mac

# Open a Developer Command Prompt

- Command: **dir, cl /EHsc**

Mac: `ls, g++ -std=c++11`

Show all contents  
under the current  
directory.  
Locate the .cpp file

Compile

lmy.exe  
is created

```
C:\Windows\System32\cmd.exe

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>dir
Volume in drive D has no label.
Volume Serial Number is BCCD-3A19

Directory of D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1

23/09/2019  02:46 PM    <DIR>          .
23/09/2019  02:46 PM    <DIR>          ..
23/09/2019  12:14 PM             7,637 ConsoleApplication1.vcxproj
10/09/2019  02:08 PM             959 ConsoleApplication1.vcxproj.filters
10/09/2019  11:41 AM             168 ConsoleApplication1.vcxproj.user
12/09/2019  04:40 PM    <DIR>          Debug
23/09/2019  02:46 PM    1,684 lmy.cpp
               4 File(s)      10,448 bytes
               3 Dir(s)  762,123,341,824 bytes free

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>cl /EHsc lmy.cpp
Microsoft (R) C/C++ Optimizing Compiler Version 19.20.27508.1 for x86
Copyright (C) Microsoft Corporation.  All rights reserved.

lmy.cpp
Microsoft (R) Incremental Linker Version 14.20.27508.1
Copyright (C) Microsoft Corporation.  All rights reserved.

/out:lmy.exe
lmy.obj

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>
```

## Difference: CLI in windows & via VS 2019

You can compile .cpp only when you use Developer Command Prompt" (aka VS Command Prompt).

```
D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>dir
Volume in drive D has no label.
Volume Serial Number is BCCD-3A19

Directory of D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1

23/09/2019  02:46 PM    <DIR>          .
23/09/2019  02:46 PM    <DIR>          ..
23/09/2019  12:14 PM             7,637 ConsoleApplication1.vcxproj
10/09/2019  02:08 PM             959 ConsoleApplication1.vcxproj.filters
10/09/2019  11:41 AM             168 ConsoleApplication1.vcxproj.user
12/09/2019  04:40 PM    <DIR>          Debug
23/09/2019  02:46 PM             1,684 lmy.cpp
               4 File(s)              10,448 bytes
               3 Dir(s)  762,130,403,328 bytes free

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>cl /EHsc lmy.cpp
'cl' is not recognized as an internal or external command,
operable program or batch file.
```

cl would not be recognized as a command if you compile file via windows.



# Command lists (cont.)

Mac : diff

- Command: **fc**
  - Compare files line by line
  - `fc <file1> <file2>`
- Compare your program outputs and sample program outputs!

# Compare your program outputs and sample program outputs

```
C:\Windows\System32\cmd.exe

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>cl /EHsc lny.cpp
Microsoft (R) C/C++ Optimizing Compiler Version 19.20.27508.1 for x86
Copyright (C) Microsoft Corporation. All rights reserved.

lmy.cpp
Microsoft (R) Incremental Linker Version 14.20.27508.1
Copyright (C) Microsoft Corporation. All rights reserved.

/out:lmy.exe
lmy.obj

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>dir
Volume in drive D has no label.
Volume Serial Number is BCCD-3A19

Directory of D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1

23/09/2019  07:25 PM    <DIR>          .
23/09/2019  07:25 PM    <DIR>          ..
23/09/2019  12:14 PM             7,637 ConsoleApplication1.vcxproj
10/09/2019  02:08 PM             959 ConsoleApplication1.vcxproj.filters
10/09/2019  11:41 AM             168 ConsoleApplication1.vcxproj.user
12/09/2019  04:40 PM    <DIR>          Debug
23/09/2019  02:46 PM             1,684 lny.cpp
23/09/2019  07:25 PM           258,048 lny.exe
23/09/2019  07:25 PM           201,070 lny.obj
23/09/2019  07:23 PM             1,730 sample-lny.cpp
23/09/2019  07:25 PM           258,560 sample-lny.exe
23/09/2019  07:25 PM           204,509 sample-lny.obj
                9 File(s)          934,365 bytes
                3 Dir(s)  762,095,337,472 bytes free

D:\CSCI 1540\Tutorial 02 Assignment 2 & Computus\lmy\ConsoleApplication1>
```

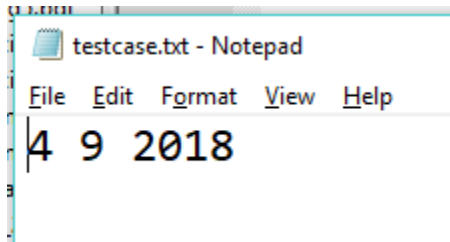
compile

Your program

Put your program and sample program in the same directory

# Compare your program outputs and sample program outputs

- Create the file 'textcase.txt' and write any date you want into it.



- Run your program and sample program, redirect outputs into 'my.txt' and 'sample.txt'

```
D:\YifanDocuments\TA_CSCI1540_C++\tutorial2_as2>stembranch.exe < testcase.txt > my.txt
D:\YifanDocuments\TA_CSCI1540_C++\tutorial2_as2>sample-stembranch.exe < testcase.txt > sample.txt
```

program

input

output

- Compare 'my.txt' with 'sample.txt'

```
D:\YifanDocuments\TA_CSCI1540_C++\tutorial2_as2>FC sample.txt my.txt
Comparing files sample.txt and MY.TXT
***** sample.txt
Press any key to continue . . .
[No need to reproduce this line!]
***** MY.TXT
*****
```

Difference after  
comparing line by  
line!

(Your program is  
correct if seeing  
such output)

# Command lists (cont.)

For both Windows and Mac

- Command: `cd ..`
  - stands for changing the current working directory to the parent folder

```
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\HW\HW\HW>cd ..  
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\HW\HW>_
```

# Command lists (cont.)

Only for Windows

- Command: **D:**
  - Change the current working directory to disc D:  
(similar for C:, D: and etc)

```
Copyright (c) 2001 Microsoft Corporation. All Rights Reserved.  
C:\Users\Administrator>D:  
D:\>
```

# Command lists (cont.)

For both Windows and Mac

- Command: **exit**
  - Quit the command line interface

```
Microsoft Windows [Version 6.1.7601]  
Copyright (c) 2009 Microsoft Corporation  
  
C:\Users\Administrator>D:  
D:\>F:  
F:\>exit_
```

Press 'enter'



The command  
interface line  
disappears

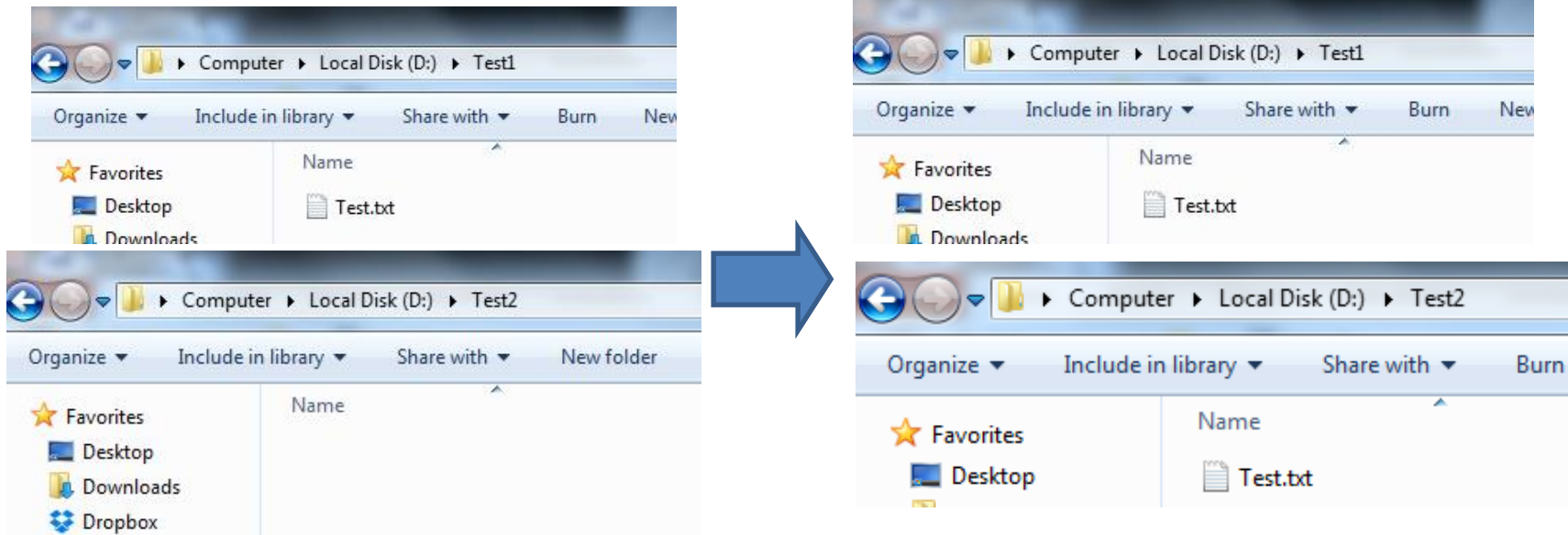
# Command lists (cont.)

Mac : cp

- Command: **copy**
  - Copy one or more files to another location

```
D:\>copy "D:\Test1\Test.txt" "D:\Test2"
```

The file "Test.txt" under "D:\Test1" is copied to the folder "D:\Test2"



# Command lists (cont.)

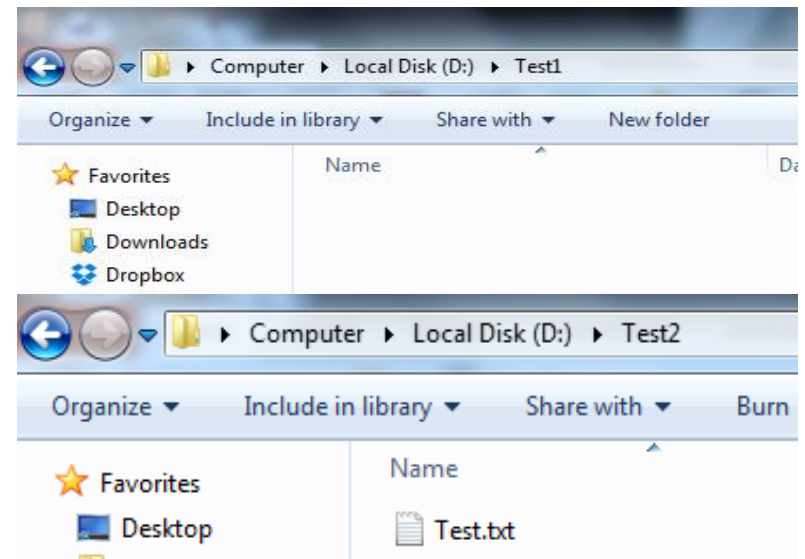
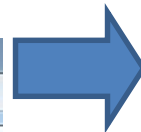
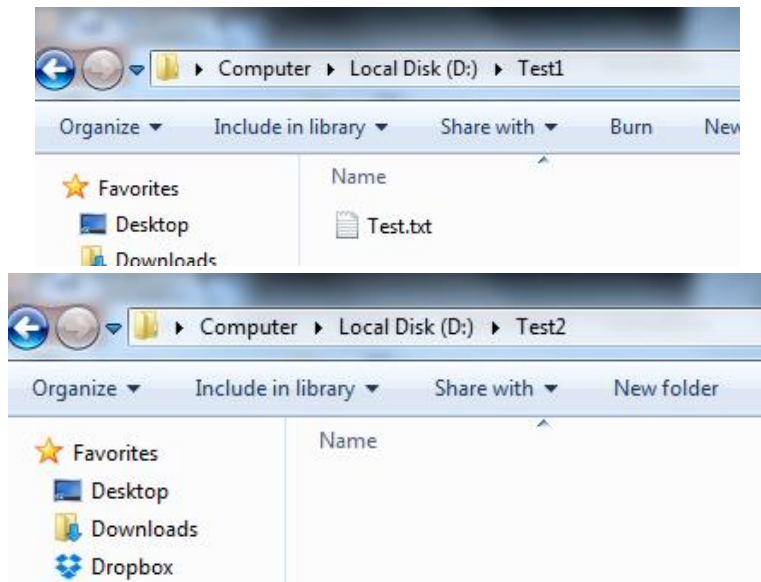
- Command: **move** Mac : mv
  - Move files from one folder to another

Mac : mv

Difference between  
“copy” and “move”?

```
D:\>move "D:\Test1\Test.txt" "D:\Test2"
```

The file “Test.txt” under “D:\Test1” is moved to the folder D:\Test2





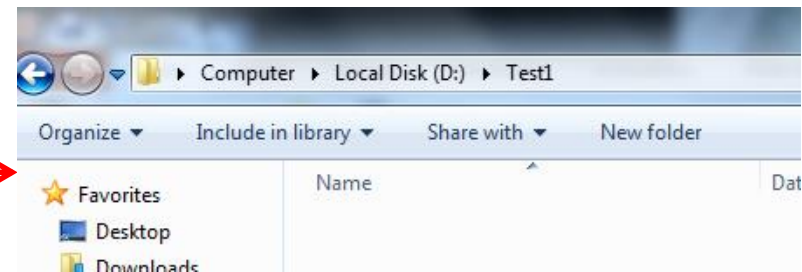
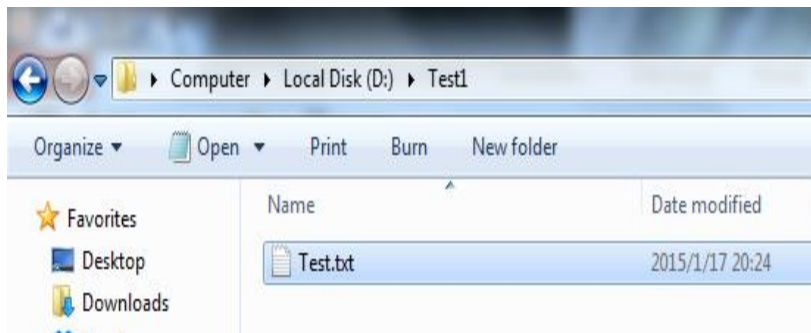
# Command lists (cont.)

- Command: **del**
  - Delete one or more files

Mac : rm

the deleted file **won't** appear in "Recycle Bin". So think twice before delete!!

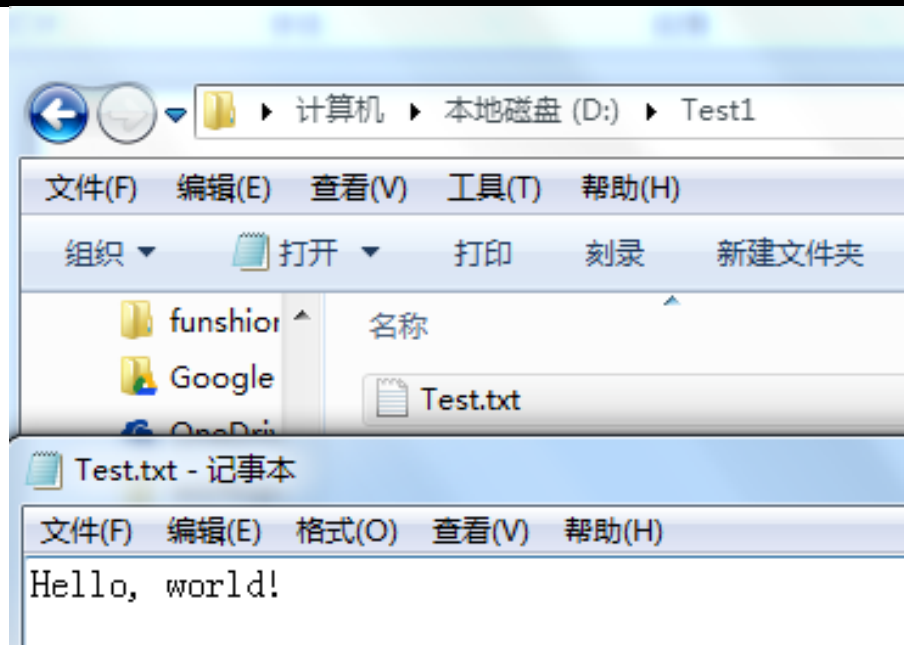
```
D:\Test1>del "Test.txt"
```



# Command lists (cont.)

- Command: **type** Mac : cat
  - Display the contents of a text file

```
D:\Test1>type "Test.txt"
Hello, world!
D:\Test1>_
```



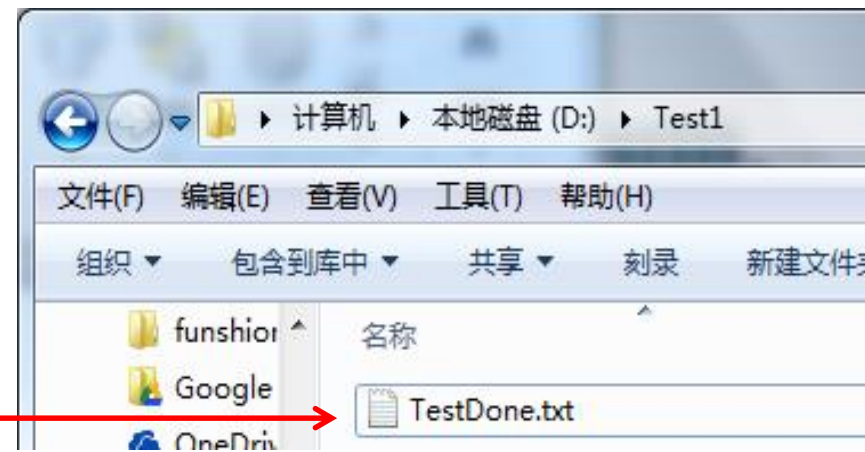
# Command lists (cont.)

- Command: **ren**

Mac : mv

– Rename a file or files

```
D:\Test1>ren "Test.txt" "TestDone.txt"
```



# Command lists (cont.)

- Command: **cls**
  - Clear the screen

Mac : clear

```
C:\> Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation

C:\Users\Administrator>D:
D:\>F:
F:\>cls
```

Press 'enter'



```
C:\> Administrator: C:\Windows\system32\cmd.exe
F:\>
```

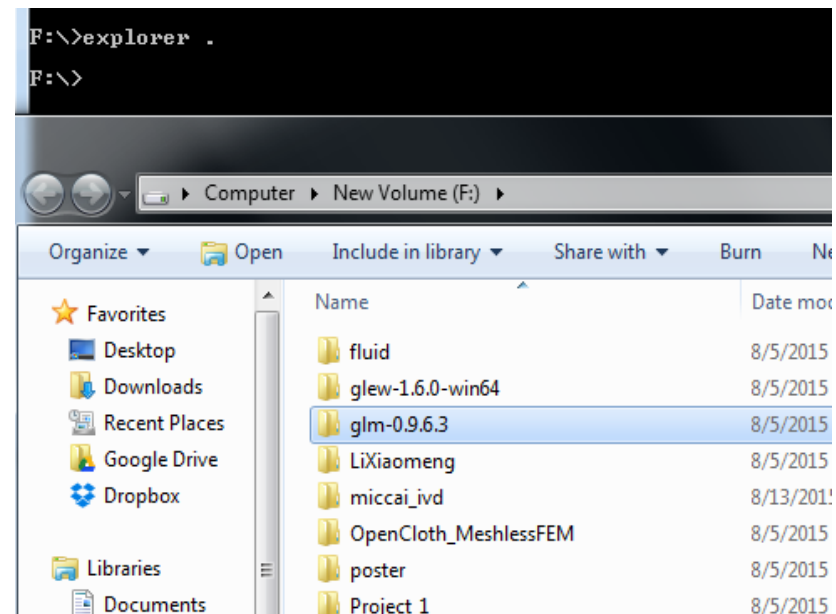
# Command lists (cont.)

Mac : open

- Command: **explorer .**, **explorer [folder path]**
  - “explorer .” opens the current folder; “explorer [folder path]” opens the folder specified by the path

```
F:\>explorer .  
F:\>
```

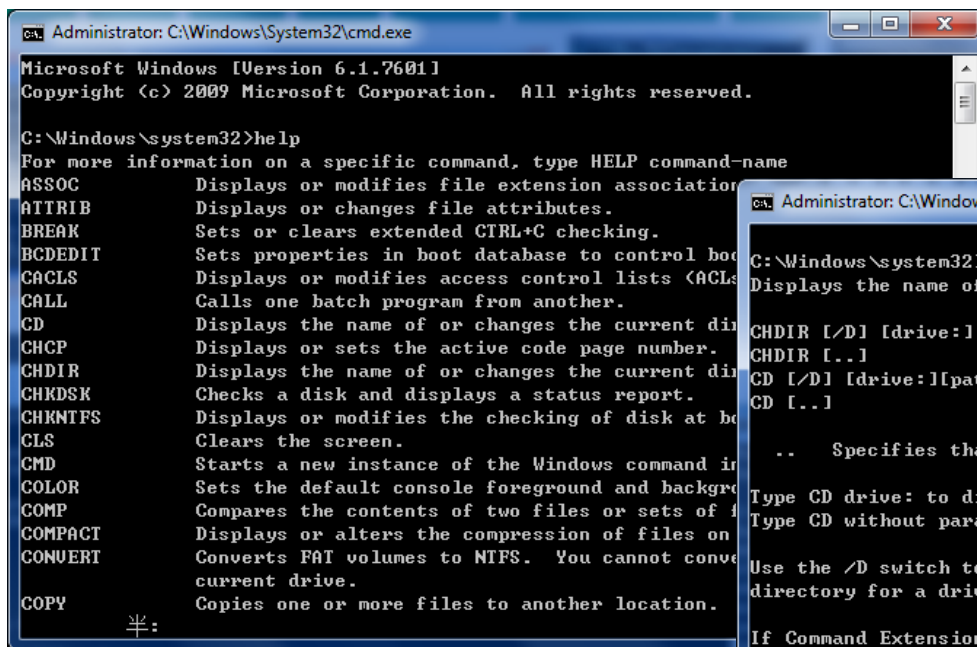
Press 'enter'



# Command lists (cont.)

Mac : man

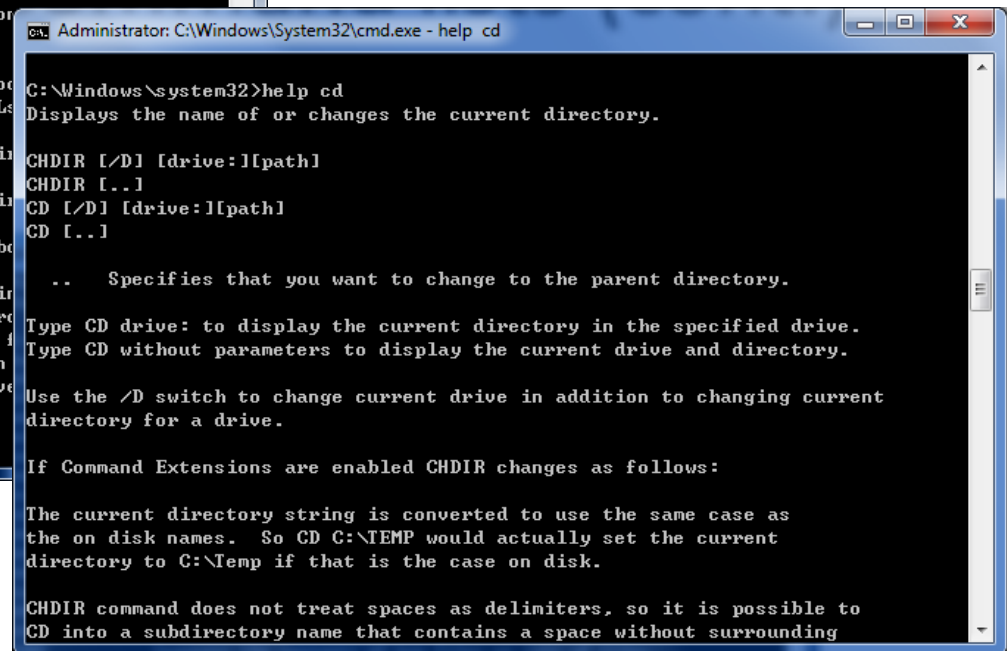
- Command: **help**
  - Provides online information about system commands (that is, non-network commands).



```
Administrator: C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\system32>help
For more information on a specific command, type HELP command-name

ASSOC      Displays or modifies file extension associations
ATTRIB     Displays or changes file attributes.
BREAK      Sets or clears extended CTRL+C checking.
BCDEDIT    Sets properties in boot database to control boot
CACLS      Displays or modifies access control lists (ACLs)
CALL       Calls one batch program from another.
CD         Displays the name of or changes the current directory
CHCP       Displays or sets the active code page number.
CHDIR      Displays the name of or changes the current directory
CHKDSK     Checks a disk and displays a status report.
CHKNTFS    Displays or modifies the checking of disk at boot
CLS        Clears the screen.
CMD        Starts a new instance of the Windows command interpreter
COLOR      Sets the default console foreground and background color
COMP       Compares the contents of two files or sets of files
COMPACT    Displays or alters the compression of files on a volume
CONVERT    Converts FAT volumes to NTFS. You cannot convert a volume
           that is already formatted as NTFS.
COPY       Copies one or more files to another location.
```



```
Administrator: C:\Windows\System32\cmd.exe - help cd
C:\Windows\system32>help cd
Displays the name of or changes the current directory.

CHDIR [/D] [drive:][path]
CHDIR [..]
CD [/D] [drive:][path]
CD [..]

.. Specifies that you want to change to the parent directory.

Type CD drive: to display the current directory in the specified drive.
Type CD without parameters to display the current drive and directory.

Use the /D switch to change current drive in addition to changing current
directory for a drive.

If Command Extensions are enabled CHDIR changes as follows:

The current directory string is converted to use the same case as
the on disk names. So CD C:\TEMP would actually set the current
directory to C:\Temp if that is the case on disk.

CHDIR command does not treat spaces as delimiters, so it is possible to
CD into a subdirectory name that contains a space without surrounding
```

# Command lists (cont.)

- Command: **help**

Mac : man

```
xyzhang@Xiaoyings-MacBook-Pro:~$ man ls
```

LS(1) BSD General Commands Manual LS(1)

**NAME**

ls -- list directory contents

**SYNOPSIS**

ls [-ABCFGHLOPRSTUW@abcdefghiklmnopqrstuwx1] [file ...]

**DESCRIPTION**

For each operand that names a file of a type other than directory, **ls** displays its name as well as any requested, associated information. For each operand that names a file of type directory, **ls** displays the names of files contained within that directory, as well as any requested, associated information.

If no operands are given, the contents of the current directory are displayed. If more than one operand is given, non-directory operands are displayed first; directory and non-directory operands are sorted separately and in lexicographical order.

The following options are available:

-@ Display extended attribute keys and sizes in long (-l) output.

# Autocompletion

For Windows

- Button “tab” for autocompletion

Press “tab” in your keyboard

```
09/10/2015 06:46 PM <DIR> .
09/10/2015 06:46 PM <DIR> ..
09/10/2015 06:46 PM      608 ascii.cpp
09/10/2015 06:46 PM    7,376 assg1.vcxproj
09/10/2015 06:46 PM    957 assg1.vcxproj.filters
09/10/2015 06:46 PM <DIR> Debug
                3 File(s)      8,941 bytes
                3 Dir(s)  189,797,896,192 bytes free

C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Assignment1\assg1>c1 /EHs
c as
```

```
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Assignment1\assg1>c1 /EHs
c ascii.cpp_
```

```
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Assignment1\assg1>c1 /EHs
c assg1.vcxproj_
```

```
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Assignment1\assg1>c1 /EHs
c assg1.vcxproj.filters_
```

```
C:\Users\Administrator\Desktop\TA\semester1\tutorial01\Assignment1\assg1>c1 /EHs
c ascii.cpp_
```

“ascii.cpp” is auto completed

Circulate among other candidate



# Autocompletion

For Mac

- Button “tab” for autocompletion

Press “tab” in your keyboard

- If there is only one candidate, directly autocomplete the “acsii.cpp”

```
xyzhang@Xiaoyings-MacBook-Pro:~/Dropbox/TA/2018term1/tutorial 1|
⇒ ls
acsii.cpp      email          tutorial01.pptx  xcode.pptx
xyzhang@Xiaoyings-MacBook-Pro:~/Dropbox/TA/2018term1/tutorial 1|
⇒ gedit acsii
xyzhang@Xiaoyings-MacBook-Pro:~/Dropbox/TA/2018term1/tutorial 1|
⇒ gedit acsii.cpp
```

- If there are many candidates, show the candidate, you can type the full name.

```
xyzhang@Xiaoyings-MacBook-Pro:~/Dropbox/TA/2018term1/tutorial 1|
⇒ ls
acsii          acsii2.cpp     tutorial01.pptx
acsii.cpp      email          xcode.pptx
xyzhang@Xiaoyings-MacBook-Pro:~/Dropbox/TA/2018term1/tutorial 1|
⇒ gedit acsii
acsii*         acsii.cpp      acsii2.cpp
```

# Wildcard character “\*”

- In CLI, wildcard character “\*” stands for any string of characters

For both Windows and Mac

Examples:

c\*.txt: means all .txt files, whose name start with “c”, e.g., c11.txt, cer.txt

ab.\*: means all formats of files with the name “ab”, e.g. ab.txt, ab.cpp, ab.pptx

\*.\*: all files

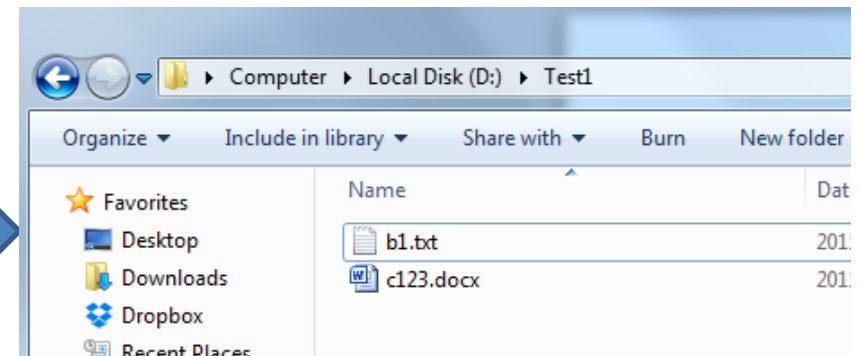
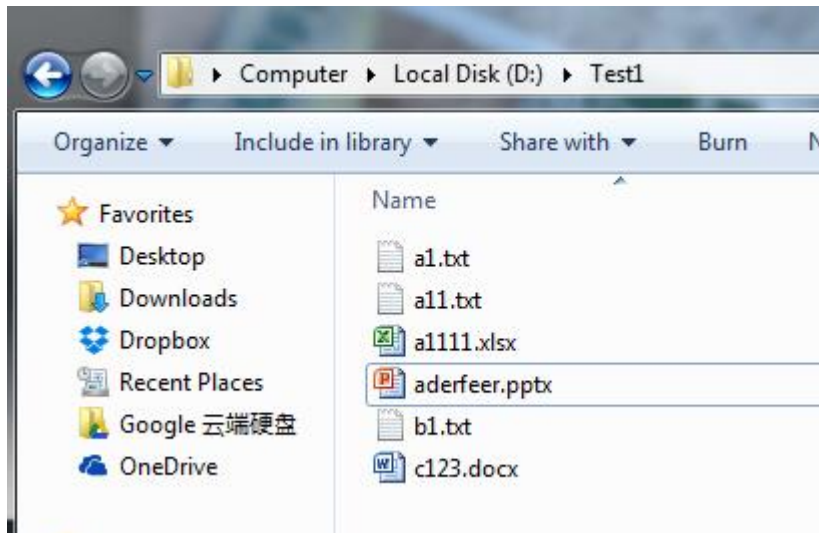
# Wildcard character “\*” (cont.)

- In CLI, wildcard character “\*” stands for any string of characters

Examples:

```
D:\>del "D:\Test1\a*.*"
```

Delete all files under  
“D:\Test1” whose  
names start with “a”



# Q&A