Getting Started with Windows Command Prompt

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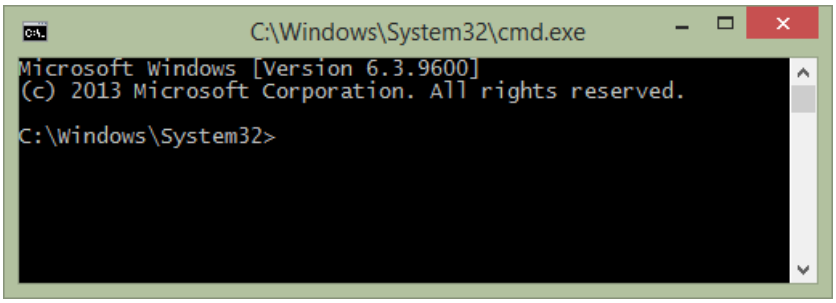
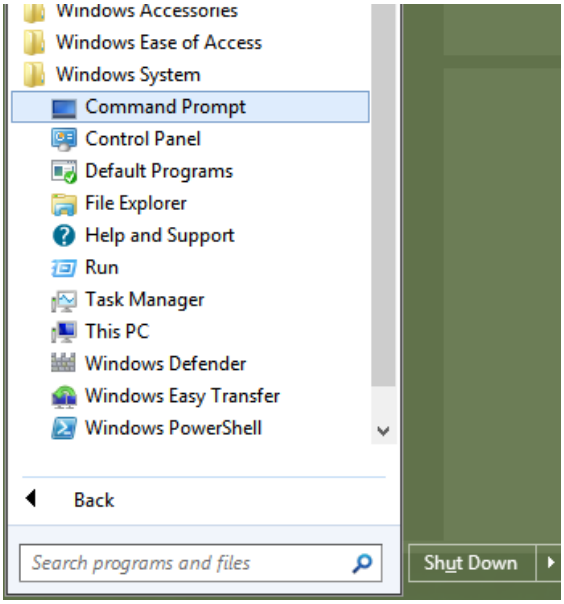


What is a Command Prompt?

In the good old days before Microsoft Windows and Apple Mac OS came about, users interacted with computers through a command prompt. This is a text-based window for typing commands and receiving text-based output (see screen shot above). Mouse and menu do not work here but the command line is a powerful interface and is very convenient for running certain programs.



How do I start a Command Prompt?

Different versions of Windows differ, so here are a few possibilities.

Method 1. From the Start Menu, select "Programs" or "Programs and Features". Scroll down to "Accessories" or "Windows systems". Choose "Command Prompt".

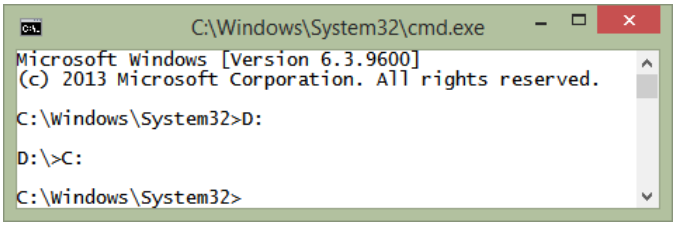
Method 2. Press the Start button, type `cmd` in the search box, and click on Run or Press Enter.

Method 3. On Windows 8, Press Win-S, type `cmd` in the search box and select "Command Prompt".

A text-based window like the above will pop up. By default this will have white text on black background. Below I will use black on white to save the planet. You can try "`color 17`", "`color 4f`" etc. to get your favourite colours. Also you can right-click on the title bar and choose Properties, to change the height and width of the window, colour, font, etc.

Hard drive and directory (cd, md)

Your computer hard drive contains a number of directories and sub-directories arranged hierarchically. When I start the command prompt, I am in the "C:\Windows\System32" directory. Some of the methods mentioned above will start in the "C:\Users\ziheng" directory. The C: drive is the default drive letter of the hard drive. If you have several drives,



they will be labelled D:, E:, etc. I use the C: drive for the OS (operating system) and program files and keep my data files on the D: drive. To change to the D: drive, type

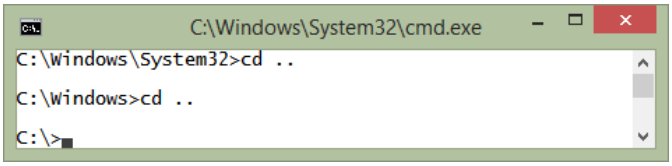
```
D:
```

We then change back to the C: drive.

```
C:
```

We use `cd` to change directory. To move one level up, type

```
cd ..
cd ..
```

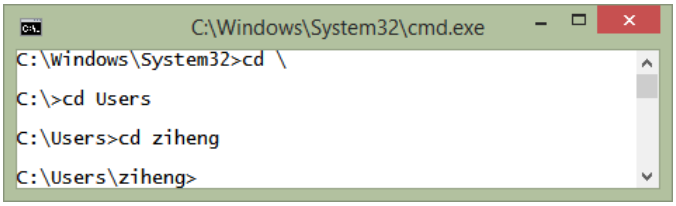


Now the prompt "C:\>" indicates we are in the root directory on the C: drive.

Absolute vs. Relative Paths

When you run `cd` to change directory, you can use an absolute path containing the entire directory structure at once. An *absolute* path starts with a slash, which means we begin from the root of the hard drive. Without the leading slash, the directory is *relative* to your current directory. In the example here, "`cd \`" takes us to the root directory on the C: drive. We then use two relative steps to go into the directory \Users\ziheng directory. All this can be achieved in one step:

```
cd \Users\ziheng
```



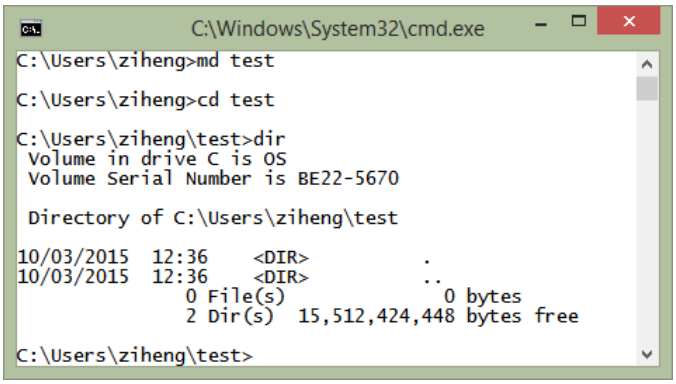
Creating a new directory (md or mkdir)

To make a new directory called test (in the current directory ziheng), type

```
md test
```

or

```
mkdir test
```



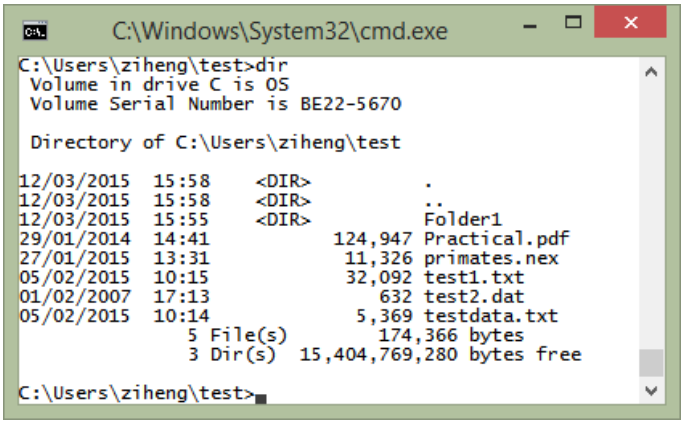
You can always use Windows explorer to create new folders and copy or move files. For this exercise, I have copied a few files into the `test` directory. Please do the same yourself.

Getting directory listings (dir)

To list the contents of a directory, type

```
dir
```

In the output, the label <DIR> indicates Folder1 is a directory while the others are files. The listing also shows the date and time the file was created or last modified. The file sizes (in bytes) are shown as well.



File extensions and wildcards

In the old times, a DOS/Windows file name (such as `test1.txt`) has two parts in the 8.3 format. The first part (`test1`) has up to 8 characters and the second part (`txt`) is 3-characters long. The second part is called the file extension and typically indicates the nature of the file. Thus `test1.txt` is a plain text file while `mb.exe` is an executable file (a program). Modern versions of Window s have relaxed those limits, but the idea of file extension is still used. Other examples include `doc` or `docx` for Word documents, `ppt` or `pptx` for PowerPoint files, `pdf` for PDF files, `jpg` or `jpeg` for jpeg files.

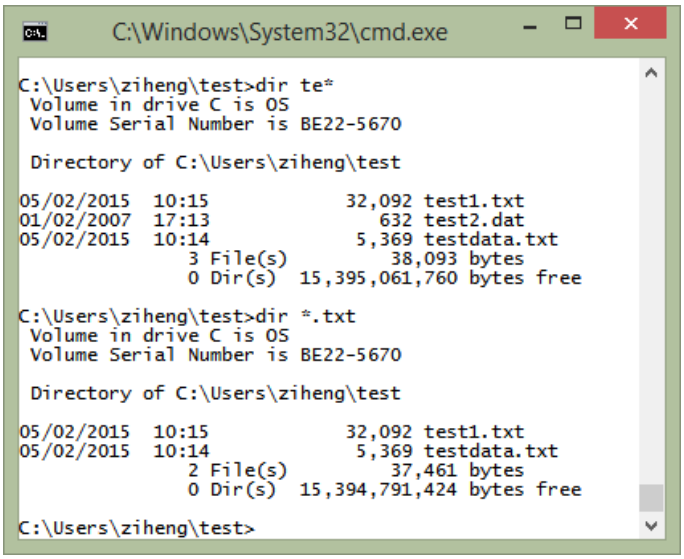
The special characters * and ? can be used as wildcards when you specify file or directory names. The asterisk * means any number of any characters while ? means one character of any kind. Thus

```
dir te*
```

will list all the files and directories that start with "te".

```
dir *.txt
```

lists all files that end with `.txt` (the text files).



Copying and deleting files

The commands `copy` and `del` are for copying and deleting files.

```
copy test1.txt test2.txt
dir
del test2.txt
dir
```

Viewing files on the screen

```
type test1.txt
more test1.txt
```

The command `type` shows the content of the file on the screen. This works for plain text files only, and rubbish and noise will pop up if the file is binary. Binary files (such as executables, Word docs, etc.) are for the machine and not for human consumption. The command `more` does the same as `type` except that it pauses for every screen of output. Hit space to continue and q to quit.

Running programs from the command line

Programs are typically executable files (.exe files). You run the program by typing the name of the program at the command line. See the discussion above about absolute and relative paths. If you have trouble remembering the full absolute path, you can find the executable file in Windows Explorer and drag it to the command line. This will copy the file name onto the command line. For example, on my computer, the following command will start Microsoft Office Excel (try something similar on your computer).

```
C:\Users\ziheng\test>"C:\Program Files (x86)\Microsoft Office\OFFICE11\EXCEL.EXE"
```

The following will run a program called BPP (file name `bpp.exe`), which is in the directory `D:\Programs\bpp3.1` on the D: drive.

```
C:\Users\ziheng\test>D:\Programs\bpp3.1\bpp.exe
```

A few tips

a) Use slash \ on Windows to specify folders. Use backslash / on Mac OSX or UNIX.
b) Commands and file and directory names are case-insensitive on Windows (MS-DOS), while they are case-sensitive on Mac OSX or UNIX.
c) You can type the first few letters of a file or directory name and then hit the Tab key so that the OS will complete the name automatically. At the command line, you can use ↑, ↓ to cycle

through old commands, and then use ← and → (and Ctrl-← and Ctrl-→ , which move one word a time) to edit the old command.

d) You can use F7 to see a list of past commands and then ↑, ↓ and Enter to select one.
e) Surround in quotes a file or directory name with spaces. For example, `dir "My Documents"`. However, this may not always work. You will make your life easier if you use English letters, numbers, and underscores only in your file names, and avoid space, non-English symbols etc.
f) When a file or directory is deleted in the command line, it is deleted permanently and is not moved into the Recycle Bin.
g) Windows Explorer by default hides file extensions for known file types. To show the file extension, choose "Windows Explorer - Tools - Folder options – View" and un-tick "Hide extensions for known file types".

Getting help

Type help to see a list of commands. There are about 100 of them. Use the following to see more information about a specific command (`copy`, say).

```
help copy
copy /?
```

Common useful Windows/Unix commands

Windows	UNIX/OSX	Function
`cd`	`cd`	Change directory (folder)
`md or mkdir`	`md or mkdir`	make a new directory
`dir`	`ls`	List files and directories
`copy file1 file2`	`cp file1 file2`	Make a copy of file1 and name it file2
`ren file1 file2`	`mv file1 file2`	Rename file1 as file2
`move file1 file2`		
`del`	`rm`	delete (remove) files
`rd`	`rmdir`	remove an empty directory
`time`	`time`	date and time mean different things in windows and unix
`date`	`date`	
`exit`	`exit`	exit
`help`	`man`	help or manual
`more`	`more`	show text file content one screen a time
`type`	`cat`	show text file content
↑, ↓	↑, ↓	Use the Up & Down arrow keys (↑ and ↓) to cycle through past commands. Then use ← and → or Ctrl-← and Ctrl-→ to move around and edit.
←, →	←, →	
`Tab`	`Tab`	Complete file or folder names
`F7`		list past commands (use ↑ and ↓ to select)
`>`	`>`	redirection: screen output will go into file
`<`	<	redirection: keyboard input will come from file
`|`	`|`	pipe: output from one program as input to next
`Esc`	`Esc`	Cancel command
`Ctrl-C`	`Ctrl-C`	terminate a command
	`nice +20 mb`	run a program or command at low priority
	`nice +20 mb &`	& places the job at the background
	`Ctrl-Z`	pause a foreground job
	`bg`	place the paused jot at the background