

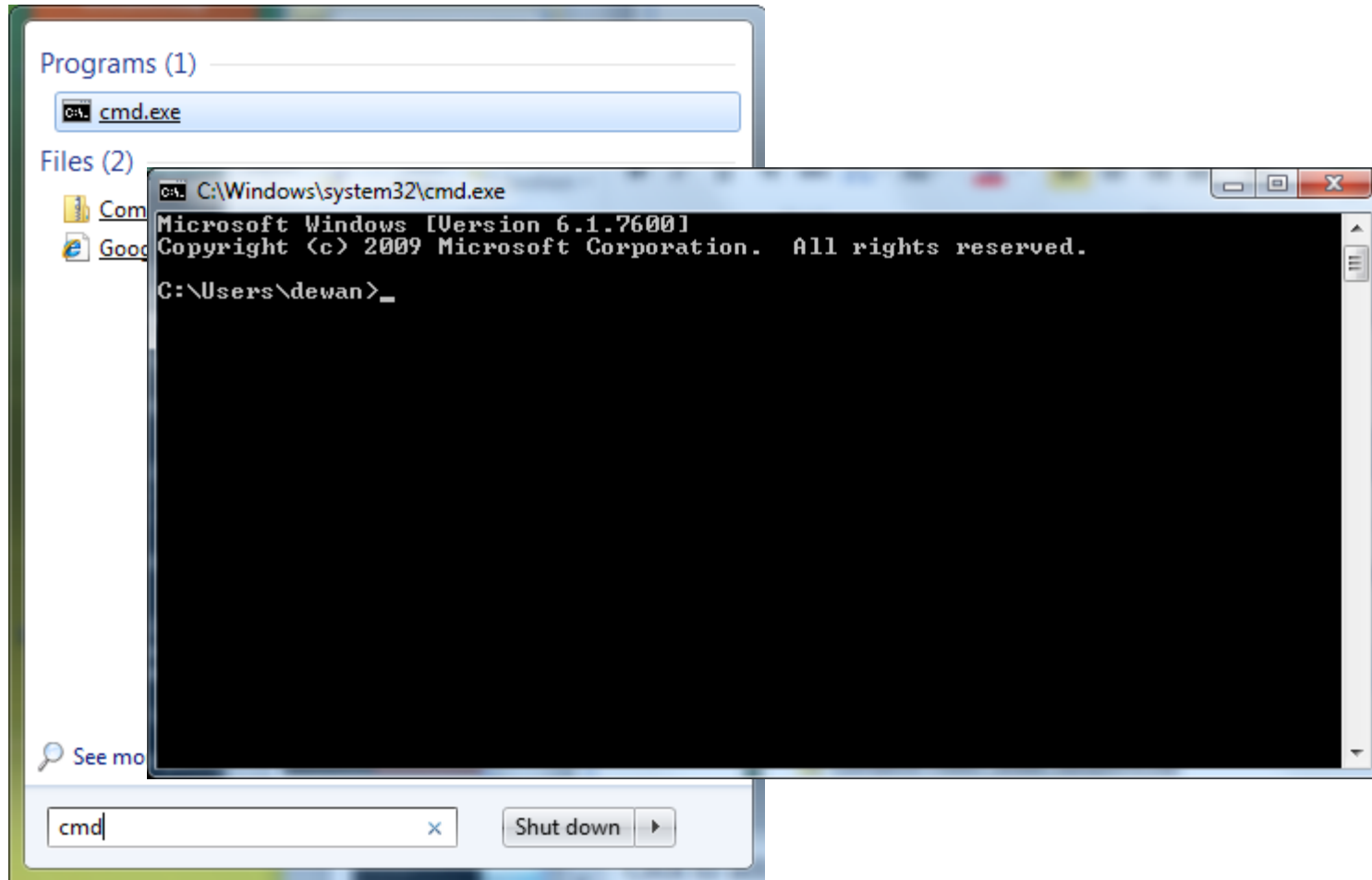


COMP 110/401 WINDOWS COMMAND INTERPRETER

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WINDOWS COMMAND INTERPRETER



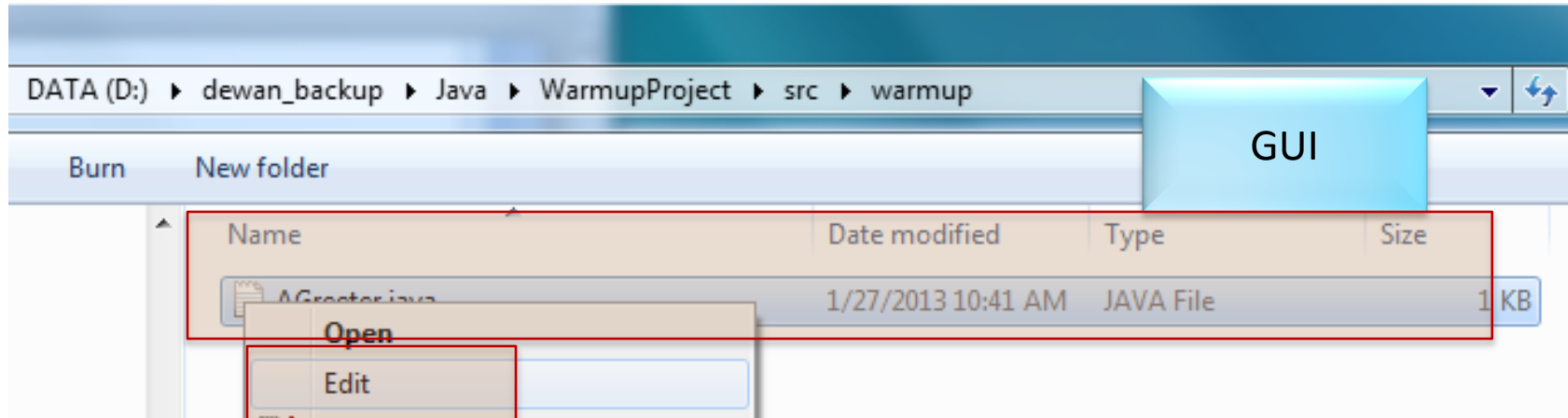
COMMAND INTERPRETER?

Interprets Command Lines

Provides alternative to (OS and Application) GUIs

```
D:\dewan_backup\Java\WarmupProject>javac -d bin src\warmup\AGreeter.java
D:\dewan_backup\Java\WarmupProject>
```

GUI ALTERNATIVE



```
D:\dewan_backup\Java\WarmupProject>dir src\warmup
Volume in drive D is DATA
Volume Serial Number is 48D8-996C
```

Command Interpreter

```
Directory of D:\dewan_backup\Java\WarmupProject\src\warmup
```

```
01/27/2013  09:52 AM    <DIR>          .
01/27/2013  09:52 AM    <DIR>          ..
01/27/2013  10:41 AM                547 AGreeter.java
                1 File(s)                547 bytes
                2 Dir(s)  109,464,555,520 bytes free
```

```
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java
```

```
D:\dewan_backup\Java\WarmupProject>
```

WHY COMMAND INTERPRETER?

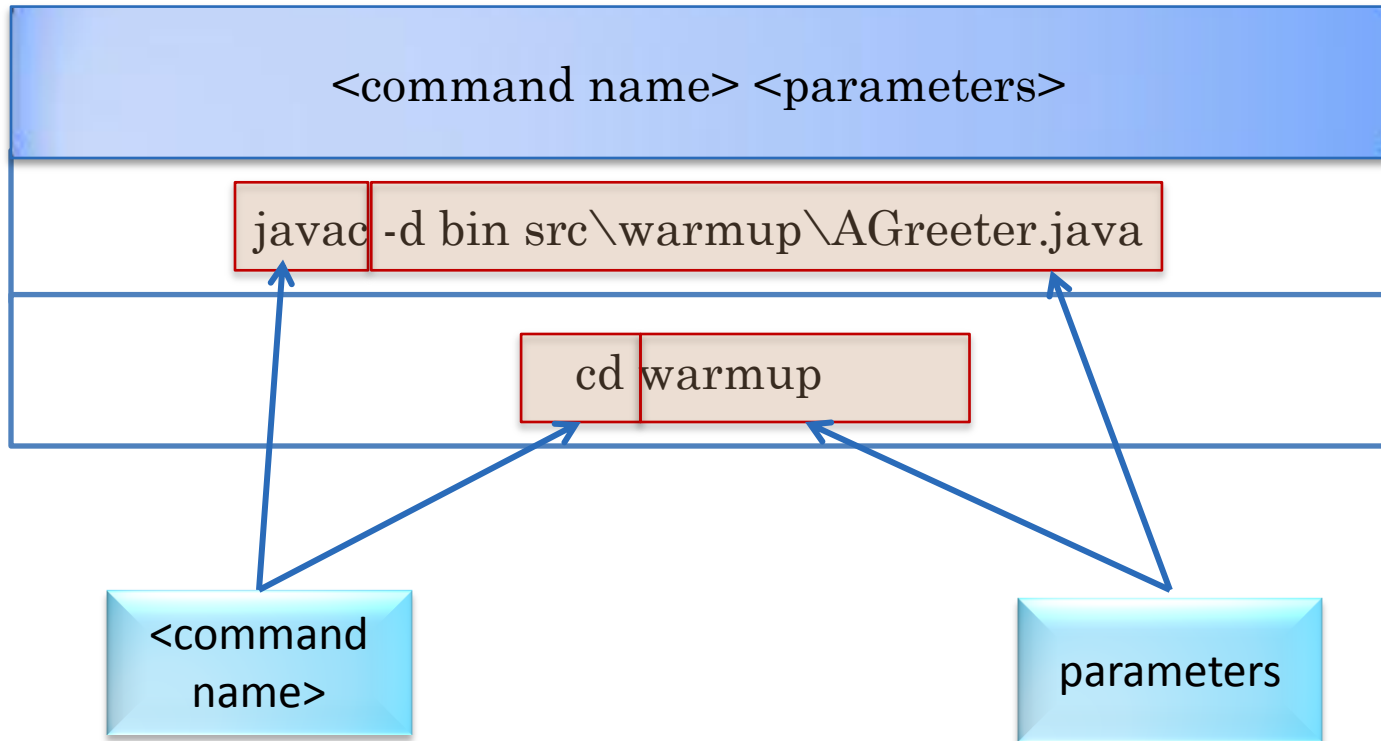
Command lines may be preferred to GUIs in some situations and by some people

Some applications and OS's do not come with GUIs and must be used through command interpreter

java, javac, kindlegen

Some think you do not know computers if you do not understand a command interpreter

COMMAND LINE SYNTAX



Command = Command Line
Command = Command Name

CLASSIFYING COMMAND (NAMES)

Internal

cd

Execute code built-into OS

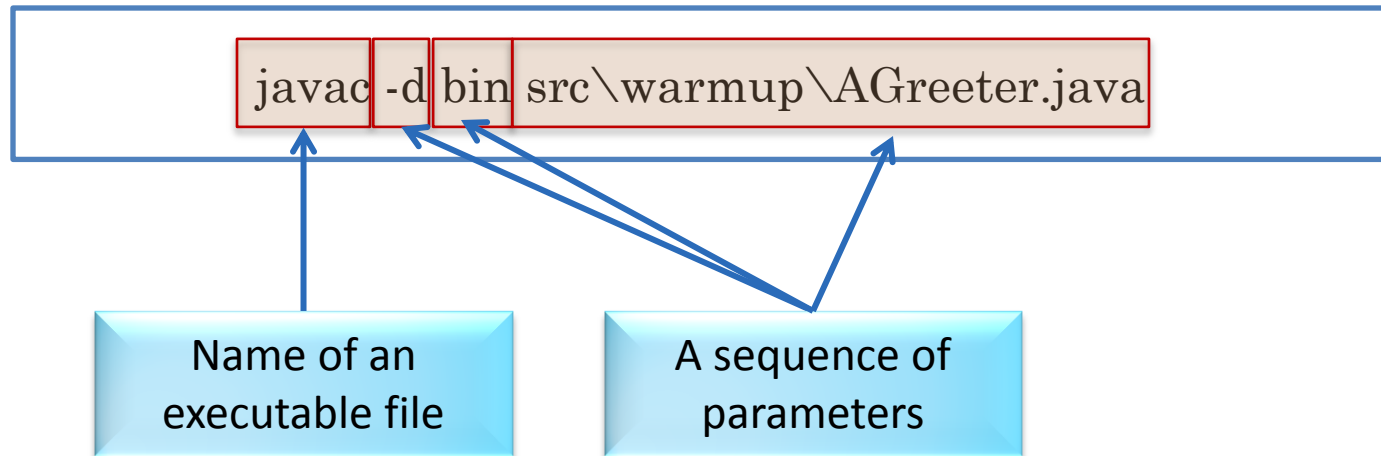
External

javac

Execute some application
program installed on top of OS

Command interpreter does not know about external
command names; so how does it run and interpret them?

RUNNING EXTERNAL COMMAND: TOKENIZATION AND TWO-STAGE COMMAND INTERPRETATION



Command interpreter separates the command line into a sequence of units or tokens divided by “separators” (spaces and tabs)

It treats the first token as the name of an executable file, finds it and executes it

It passes the remaining tokens to the newly executed program, which then interprets them

One or more of the parameters may be file (and folder) names

COMMAND INTERPRETER SEARCHING FOR EXECUTABLE COMMAND: FIRST INTERPRETATION STAGE

It treats the first token as the name of an executable file, finds it and executes it

```
D:\dewan_backup\Java\WarmupProject>nonExistentCommand -nonExistentParameter  
'nonExistentCommand' is not recognized as an internal or external command,  
operable program or batch file.
```

EXTERNAL PROGRAM INTERPRETING PARAMETERS: SECOND INTERPRETATION STAGE

It passes the remaining tokens to the newly executed program, which then interprets it

```
D:\dewan_backup\Java\WarmupProject>javac -nonExistentParameter
javac: invalid flag: -nonExistentParameter
Usage: javac <options> <source files>
use -help for a list of possible options
```

TOKENIZATION

```
D:\dewan_backup\Java\WarmupProject>D:\Program Files\Java\jdk1.7.0_11\bin\javac -  
d bin src\warmup\AGreeter.java  
'D:\Program' is not recognized as an internal or external command,  
operable program or batch file.  
D:\dewan_backup\Java\WarmupProject>
```

D:\Program Files\Java\jdk1.7.0_11\bin\javac -d bin src\warmup\AGreeter.java

First token = command-name

USING QUOTES FOR TOKENS WITH SPACES

```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```

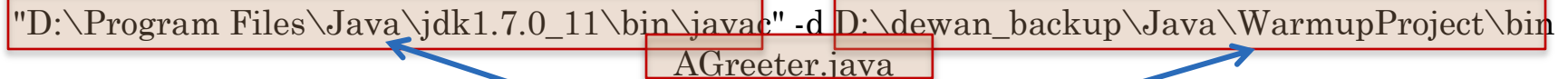
'D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin
AGreeter.java

First token = command-name

HOW TO NAME FILES (AND FOLDERS)

One or more of the parameters may be file (and folder) names

```
"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin  
AGreeter.java
```



File Names

Files and folders are both often called files

RELATIVE/PARTIAL VS. ABSOLUTE/FULL NAMES

Longer names but simpler
naming scheme

Absolute name

"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin
AGreeter.java

Relative name

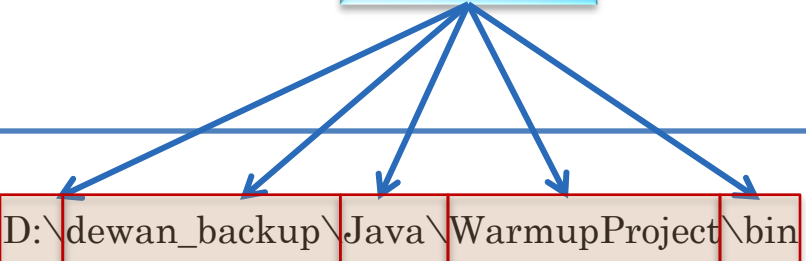
Shorter names but more
complicated naming
scheme

LOCAL NAME OF FILE/FOLDER

A file or folder is always created within some parent folder to create a hierarchical file system

Local Name

`"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin
AGreeter.java`



The name given within the parent folder is called the local name of the file/folder

ABSOLUTE/FULL NAME

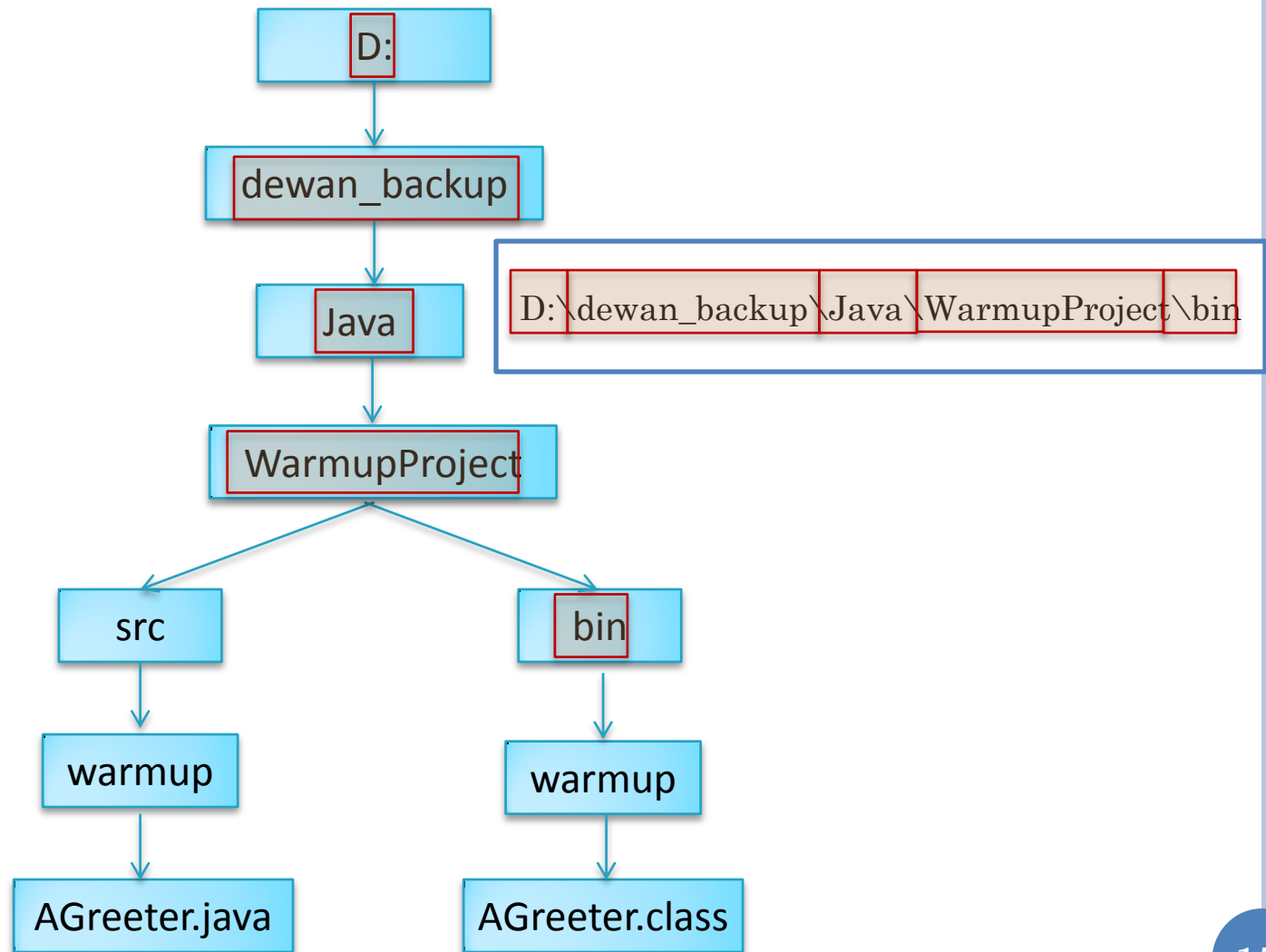


`"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin`
`AGreeter.java`

Gives the full "path" name, with each name taking isone level down in the folder hierarchy

Names are separated by \

TRAVERSING DOWN THE HIERARCHY



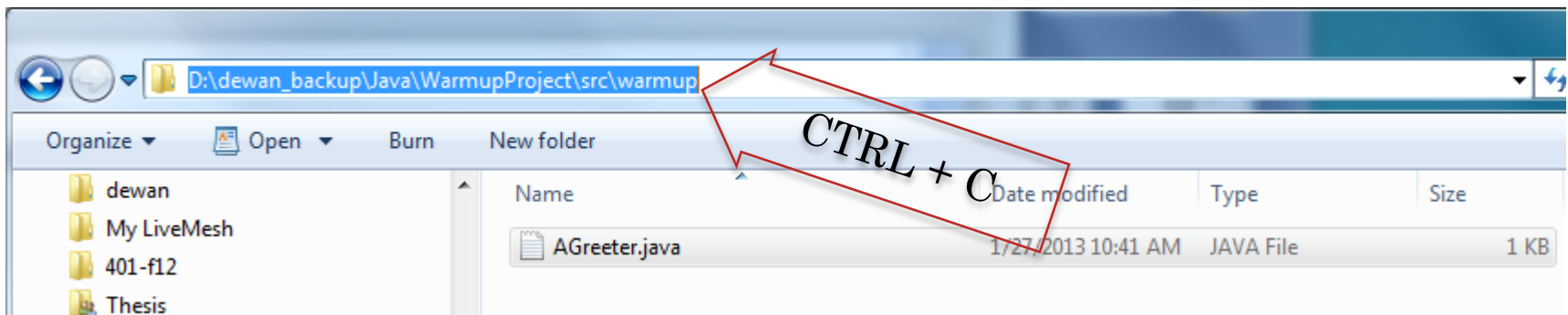
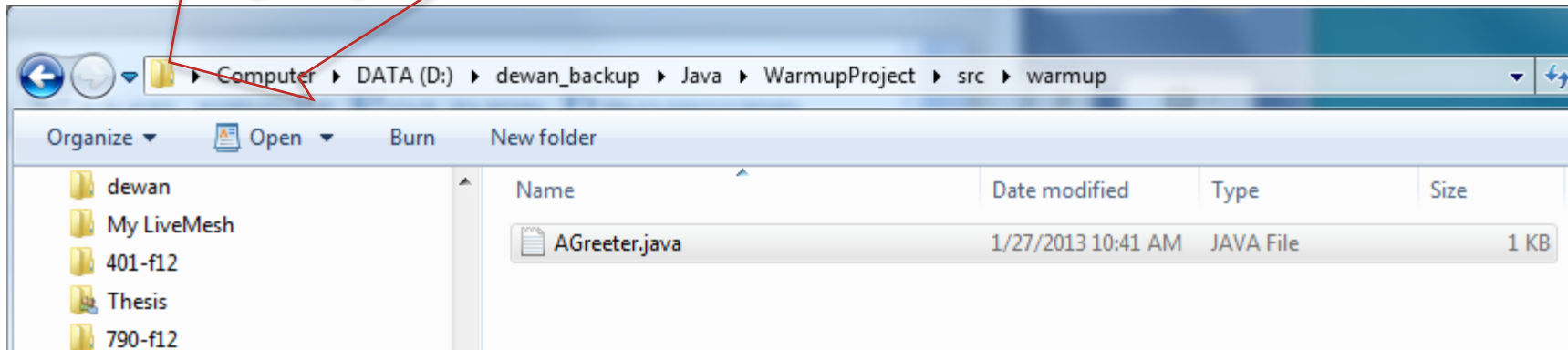
REDUCING EFFORT TO ENTER ABSOLUTE NAMES

Copy Absolute Name from GUI and Paste into Command Line

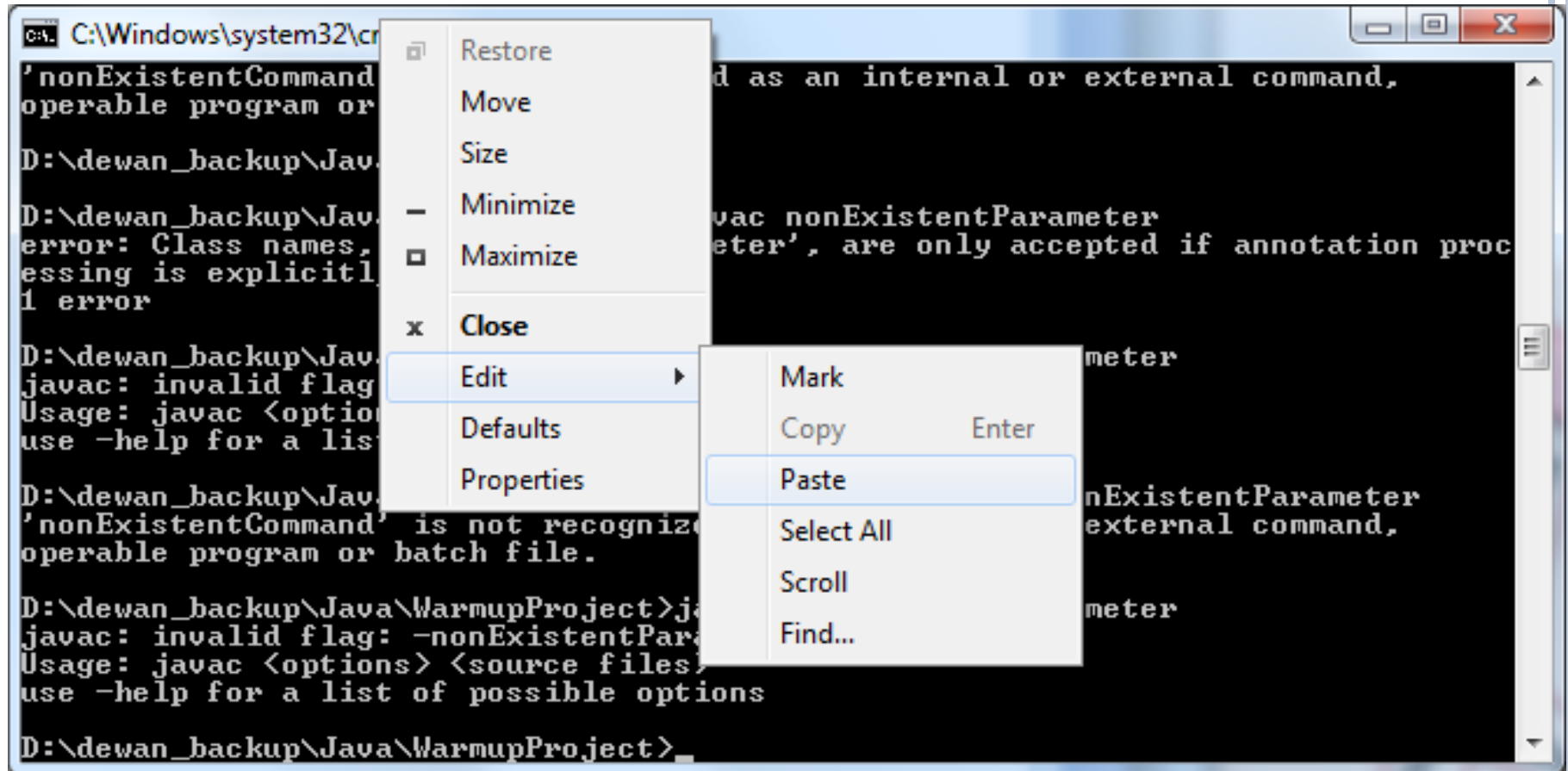
Edit Previously Entered Command Line

COPY ABSOLUTE NAME FROM FOLDER BROWSER GUI

Click mouse to get full name



PASTE INTO COMMAND LINE

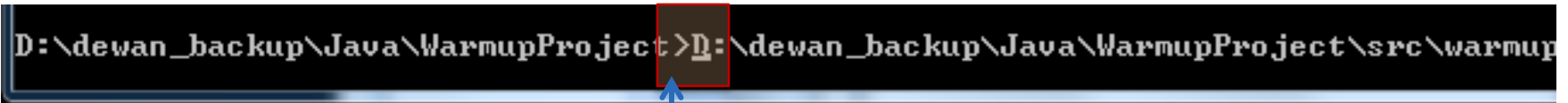


Top border, Right menu → Edit → Paste

TEXT PASTED AT CURRENT CURSOR POSITION

```
D:\dewan_backup\Java\WarmupProject>D:\dewan_backup\Java\WarmupProject\src\warmup
```

USE LEFT AND RIGHT ARROW KEYS TO CHANGE CURSOR POSITION



```
D:\dewan_backup\Java\WarmupProject>D:\dewan_backup\Java\WarmupProject\src\warmup
```

Cursor at start of line

CAN INSERT OR DELETE AT CURSOR POINT



```
D:\dewan_backup\Java\WarmupProject>"D:\dewan_backup\Java\WarmupProject\src\warmu  
p
```

" inserted at start of line

RELATIVE NAME

Relative to current directory (or folder)

Relative to folders in System Path

CURRENT DIRECTORY

Each command interpreter is associated with a current directory or folder name, parts of the Windows prompt

```
D:\dewan_backup\Java\WarmupProject>
```

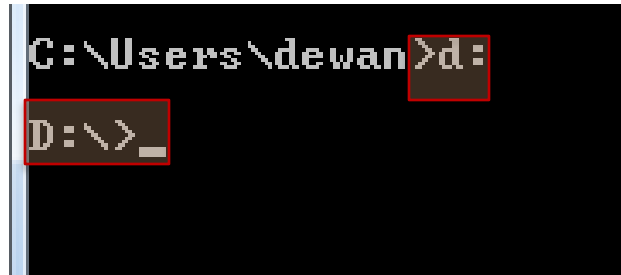
Build-in **cd** command can be used to change the current directory to some other directory on the same drive

Build-in **drive** command can be used to change drive

Initial folder is home directory of logged in user

```
Microsoft Windows [Version 6.1.7600]  
Copyright (c) 2009 Microsoft Corporation. All rights reserved.  
C:\Users\dewan>
```

CHANGING DRIVES



A screenshot of a Windows command prompt window. The prompt shows the current directory as C:\Users\dewan. The user has entered the command 'd:' to switch to the D: drive. The prompt has moved to D:\, and a cursor is visible at the end of the line.

```
C:\Users\dewan>d:  
D:\>_
```

Command = Drive Name:

Case does not matter in drive
file names on Windows

CHANGING FOLDER WITHIN DRIVE: CD COMMAND

```
D:\>cd D:\dewan_backup\Java\WarmupProject  
D:\dewan_backup\Java\WarmupProject>
```

cd <folder name>

Current directory ← <folder name>

NAME RELATIVE TO CURRENT DIRECTORY

Relative to current directory (or folder)

Given current directory
with absolute name: a

Relative name: r =

a file with absolute
name: a\r

```
D:\dewan_backup>cd Java\WarmupProject
D:\dewan_backup\Java\WarmupProject>
```

RELATIVE NAME

Relative to single current directory (or folder)

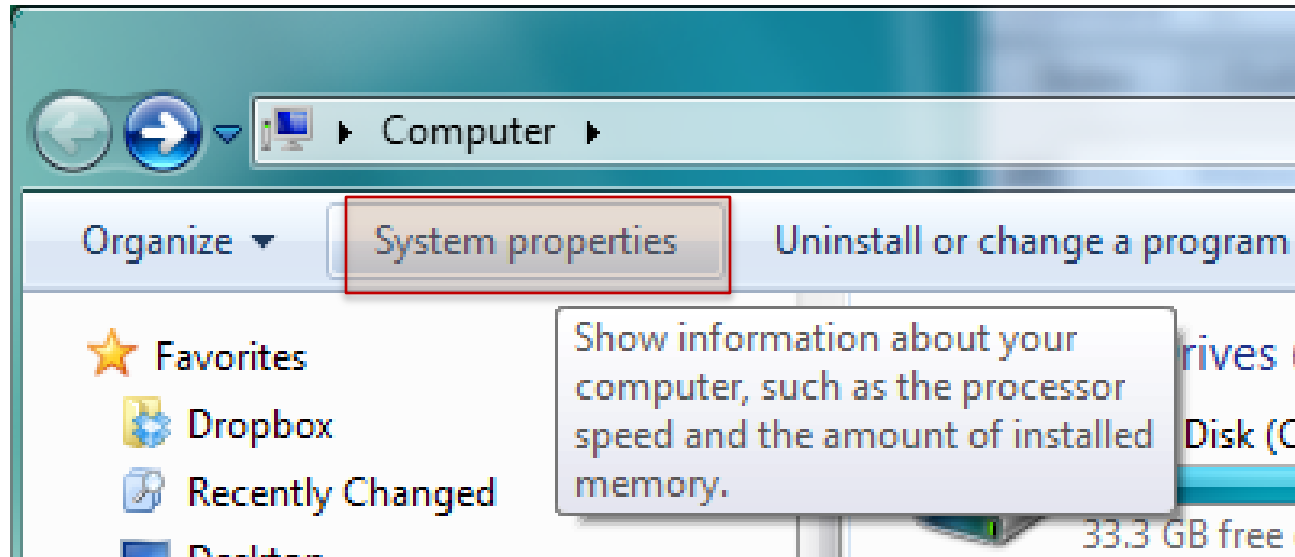
Can be used in both command names and file parameters

```
"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin  
AGreeter.java
```

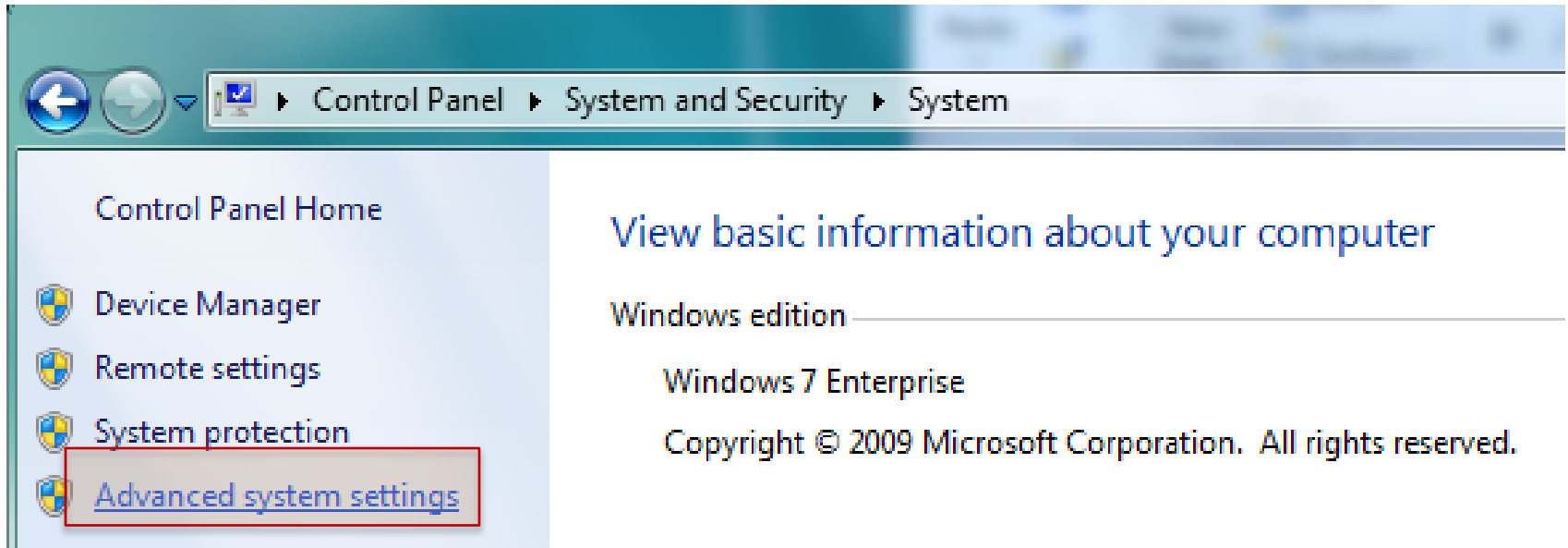
Used only in command names

Relative to multiple folders in System Path

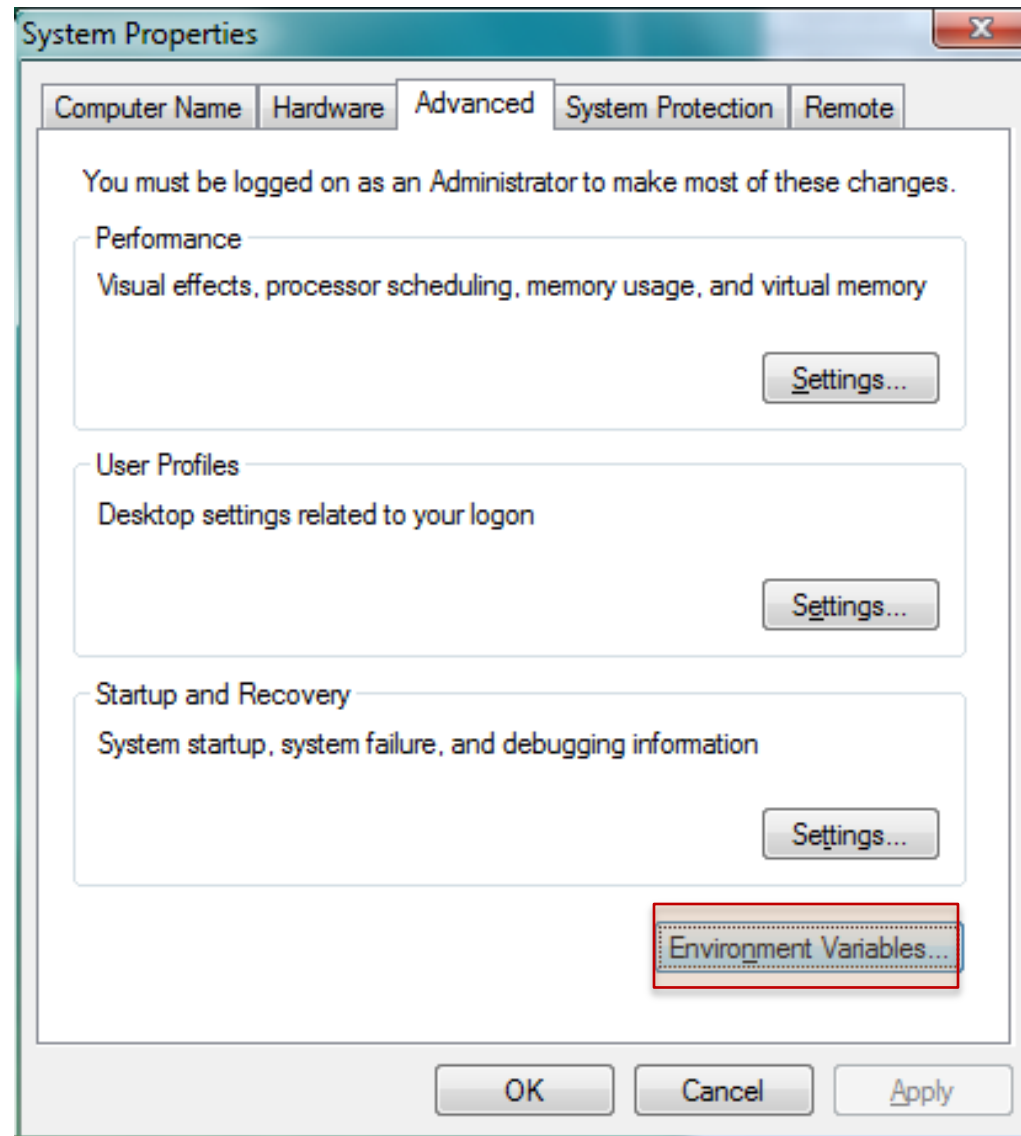
SETTING SYSTEM PATH: SYSTEM PROPERTIES



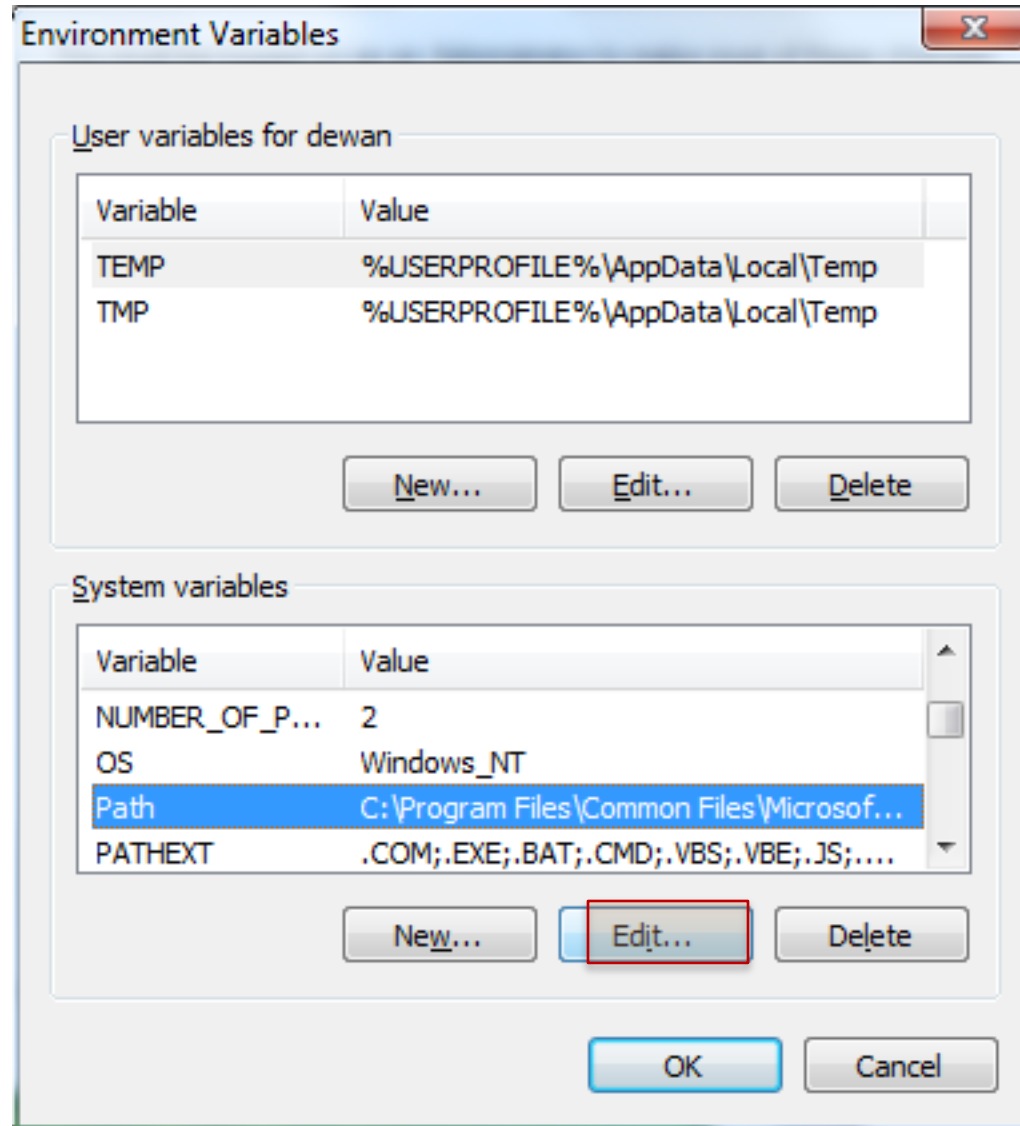
SETTING SYSTEM PATH: ADVANCED SYSTEM SETTINGS



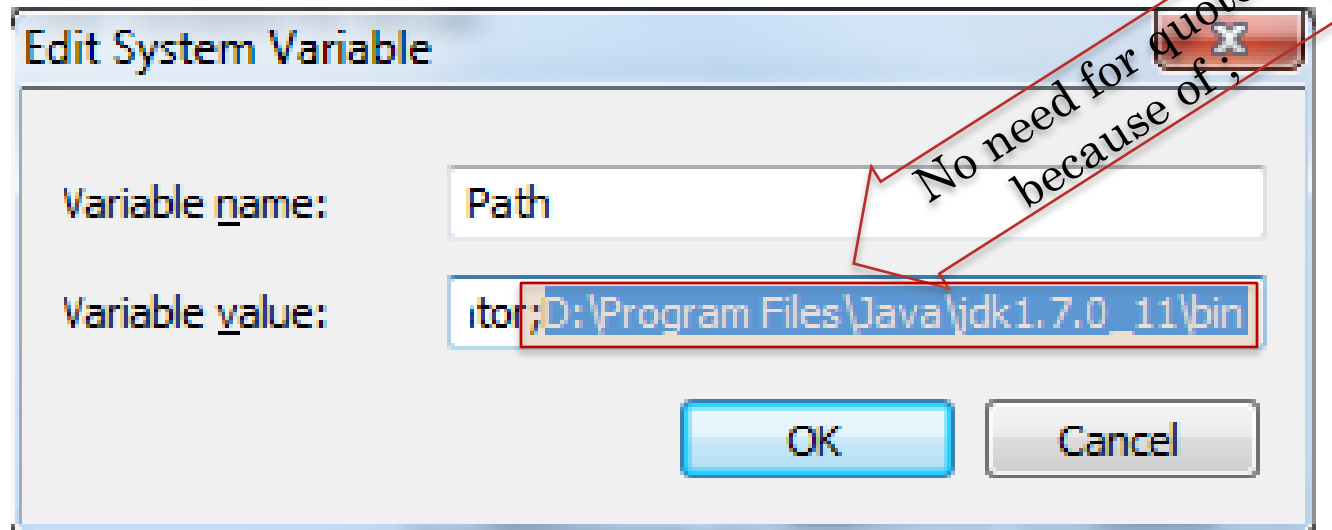
SETTING SYSTEM PATH: ENVIRONMENT VARIABLES



SELECT PATH SYSTEM: SELECT PATH VARIABLE AND EDIT



SELECT PATH SYSTEM: ADD FOLDER TO PATH AFTER SEMICOLON



```
D:\dewan_backup\Java\WarmupProject>javac -d bin src\warmup\AGreeter.java
D:\dewan_backup\Java\WarmupProject>
```

D:\Program Files\Java\jdk1.7.0_11\bin\javac

REUSING COMMANDS: COMMAND HISTORY

```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>_
```

Want to execute (portion of) a command in history

Use up and down arrow keys to reuse commands in history

REUSING COMMANDS: UP ARROW DISPLAYS PREVIOUS EDITABLE COMMAND

```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java_
```

First Up-Arrow shows
last command

REUSING COMMANDS: UP ARROW DISPLAYS PREVIOUS EDITABLE COMMAND

```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java_
```

Second Up Arrow
shows second last
command

REUSING COMMANDS: ENTER EXECUTES (POSSIBLY EDITED) PREVIOUS COMMAND

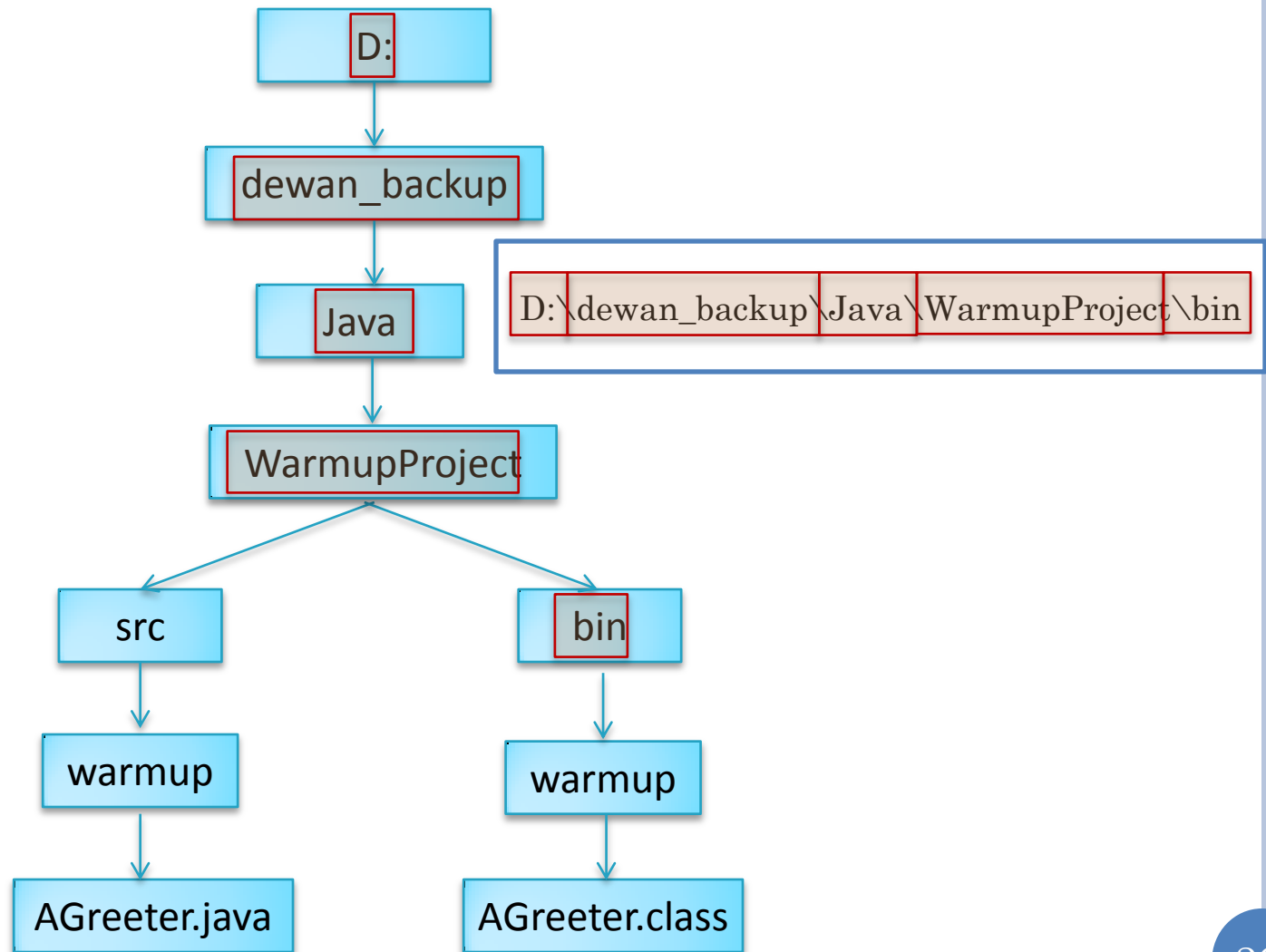
```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac"  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```

Enter

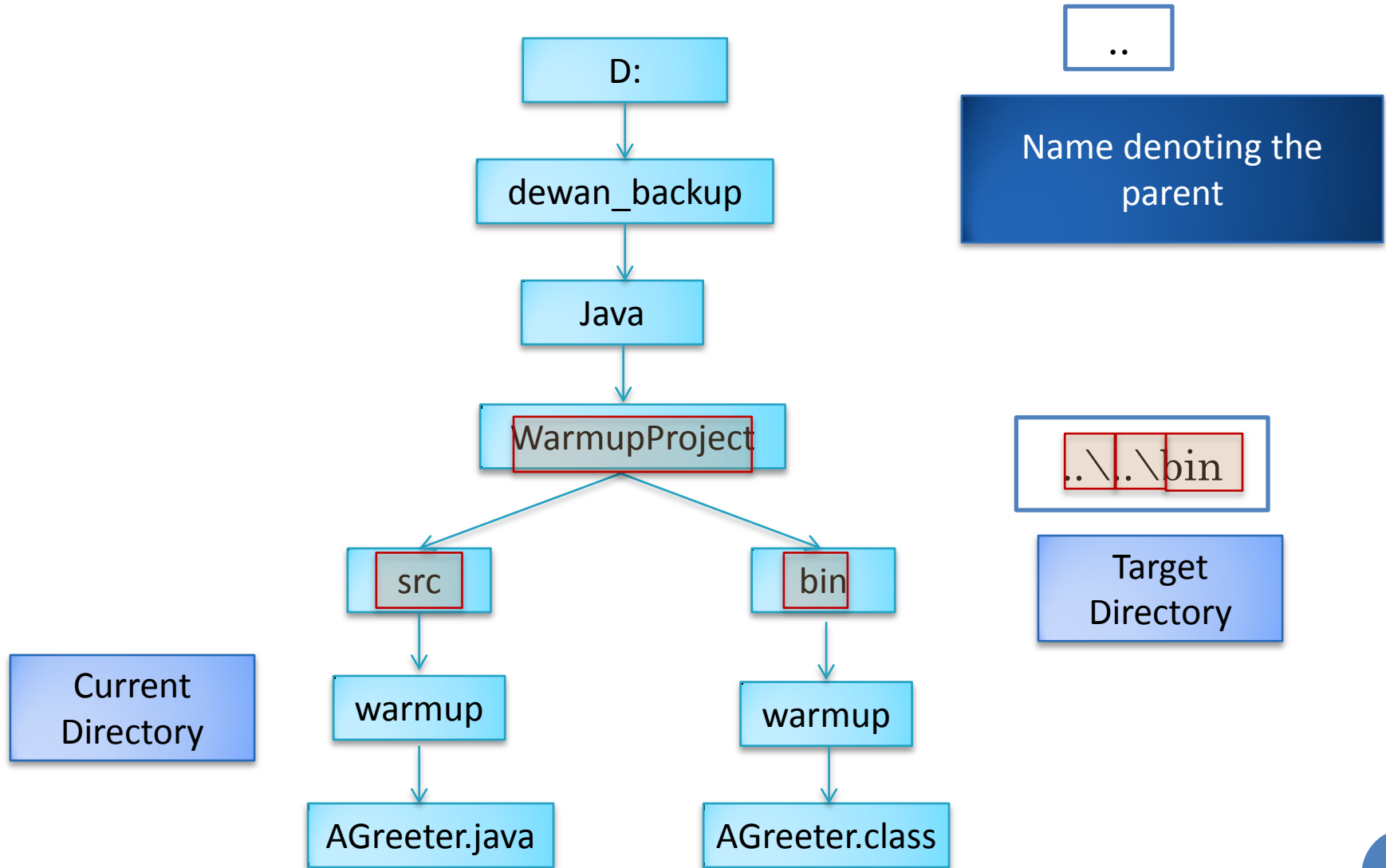
Could have edited
command

History particularly useful if absolute
files names entered

MORE ON NAMES: TRAVERSING DOWN THE HIERARCHY



TRAVERSING UP (AND DOWN) THE HIERARCHY



USE OF ..

```
D:\dewan_backup\Java\WarmupProject\src\warmup>javac -d ../../bin AGreeter.java
```

```
D:\dewan_backup\Java\WarmupProject\src\warmup>dir ../../bin/warmup
```

```
Volume in drive D is DATA  
Volume Serial Number is 48D8-996C
```

```
Directory of D:\dewan_backup\Java\WarmupProject\bin\warmup
```

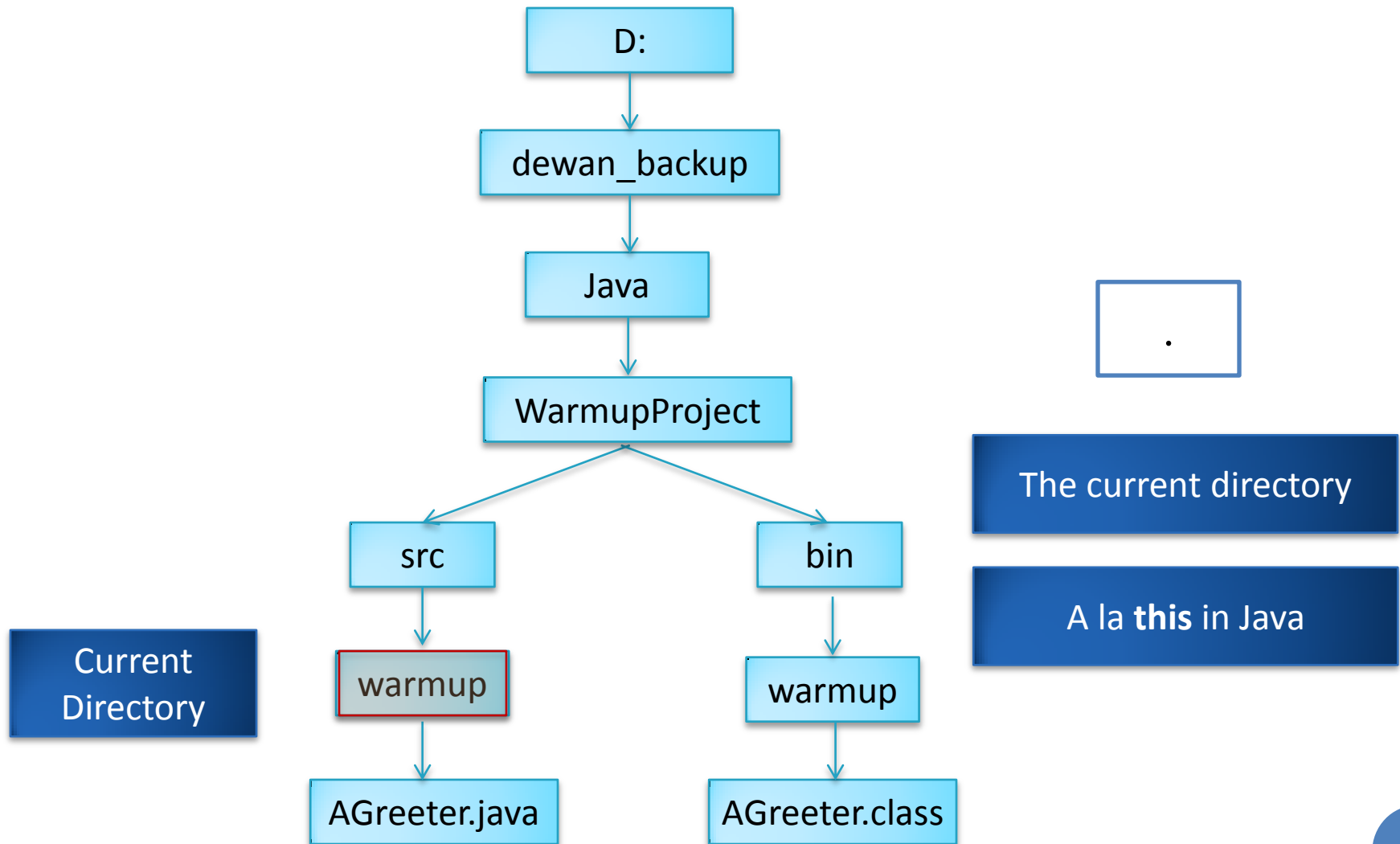
```
01/27/2013  10:42 AM    <DIR>          .  
01/27/2013  10:42 AM    <DIR>          ..  
01/30/2013  01:28 AM                957 AGreeter.class  
           1 File(s)                957 bytes  
           2 Dir(s)  109,465,231,360 bytes free
```

```
D:\dewan_backup\Java\WarmupProject\src\warmup>cd ..
```

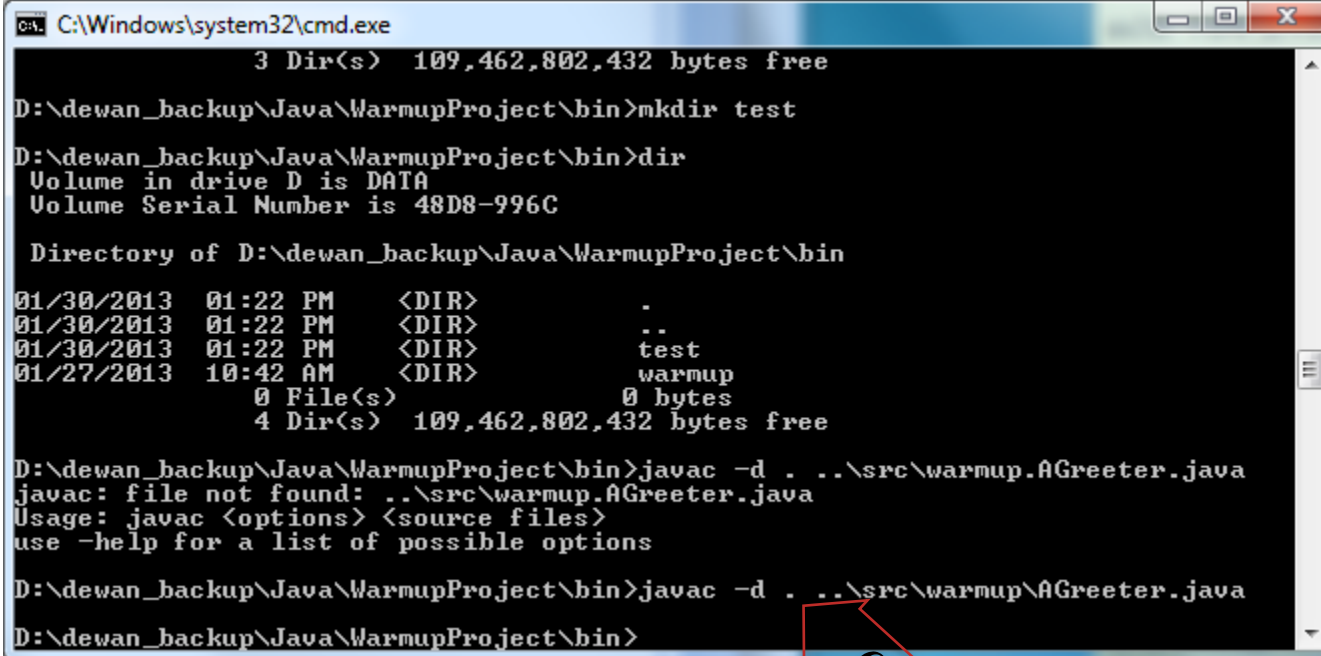
```
D:\dewan_backup\Java\WarmupProject\src>cd ..
```

```
D:\dewan_backup\Java\WarmupProject>_
```

NAMING CURRENT DIRECTORY



USE OF .



```
C:\Windows\system32\cmd.exe
3 Dir(s) 109,462,802,432 bytes free

D:\dewan_backup\Java\WarmupProject\bin>mkdir test

D:\dewan_backup\Java\WarmupProject\bin>dir
Volume in drive D is DATA
Volume Serial Number is 48D8-996C

Directory of D:\dewan_backup\Java\WarmupProject\bin

01/30/2013  01:22 PM    <DIR>          .
01/30/2013  01:22 PM    <DIR>          ..
01/30/2013  01:22 PM    <DIR>          test
01/27/2013  10:42 AM    <DIR>          warmup
               0 File(s)                0 bytes
               4 Dir(s) 109,462,802,432 bytes free

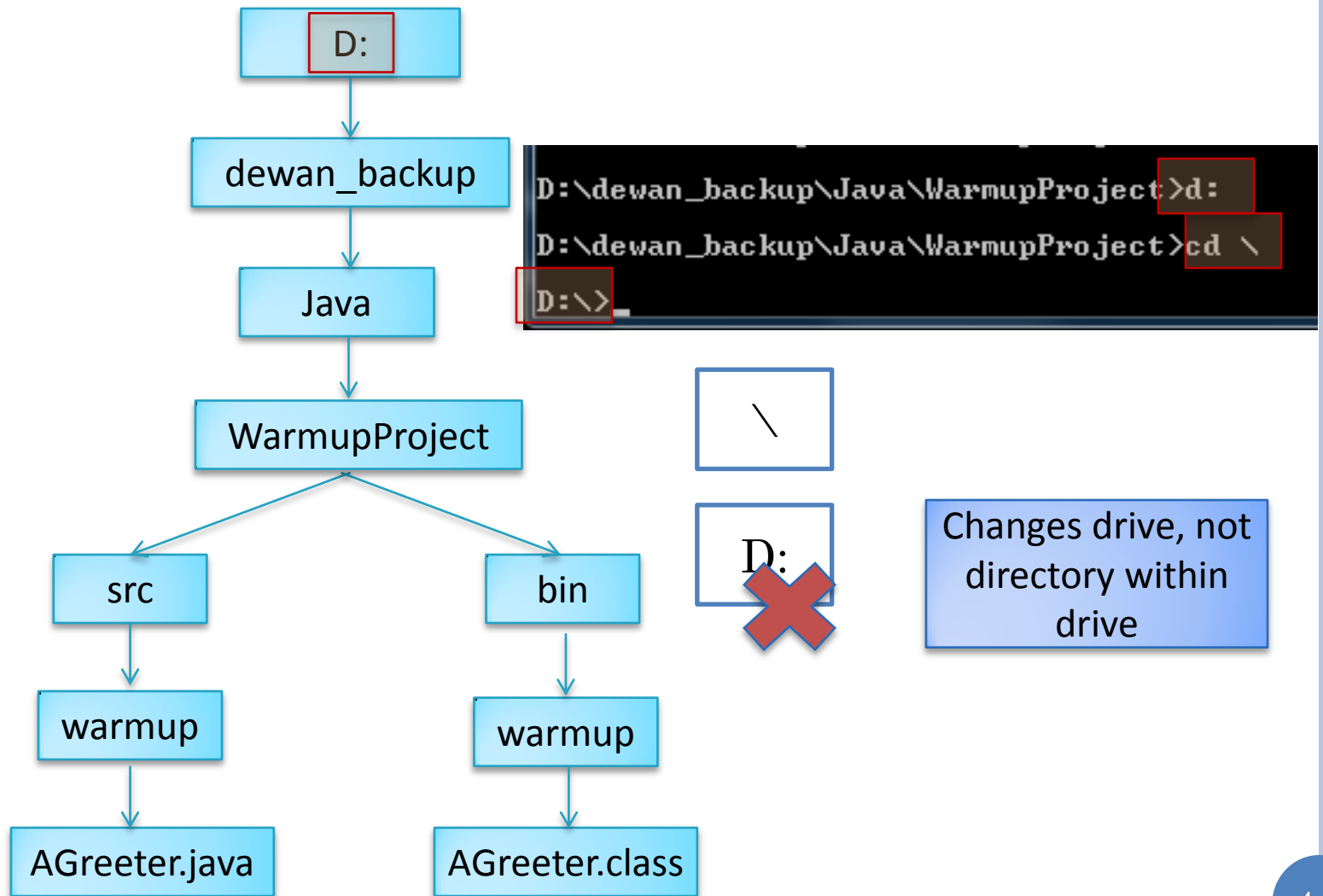
D:\dewan_backup\Java\WarmupProject\bin>javac -d . ..\src\warmup\AGreeter.java
javac: file not found: ..\src\warmup\AGreeter.java
Usage: javac <options> <source files>
use -help for a list of possible options

D:\dewan_backup\Java\WarmupProject\bin>javac -d . ..\src\warmup\AGreeter.java

D:\dewan_backup\Java\WarmupProject\bin>
```

Current directory

NAMING ROOT FOLDER ON DRIVE



COMPLETING FILE NAME TOKEN

```
D:\>cd Pro
```

Hit tab

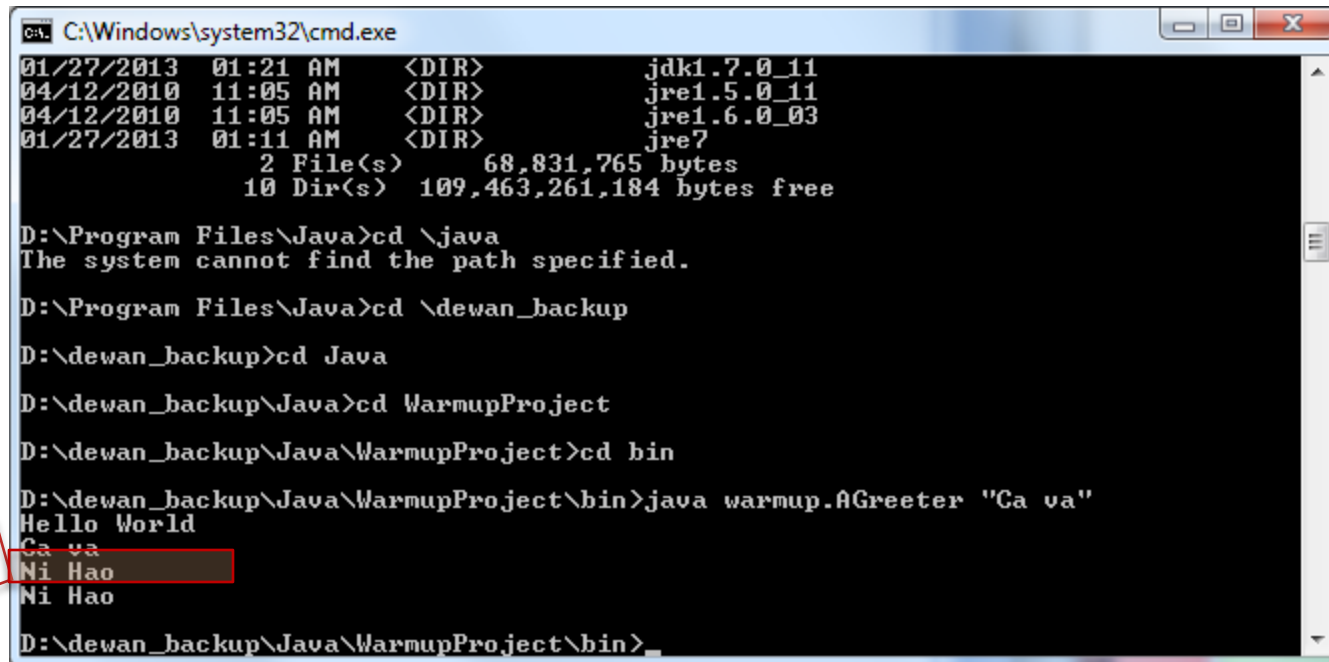
COMPLETING FILE NAME TOKEN

```
D:\>cd "Program Files"
```

Hit tab to complete token if known
to application completing

Should choose unique prefix

SAVING INTERACTION



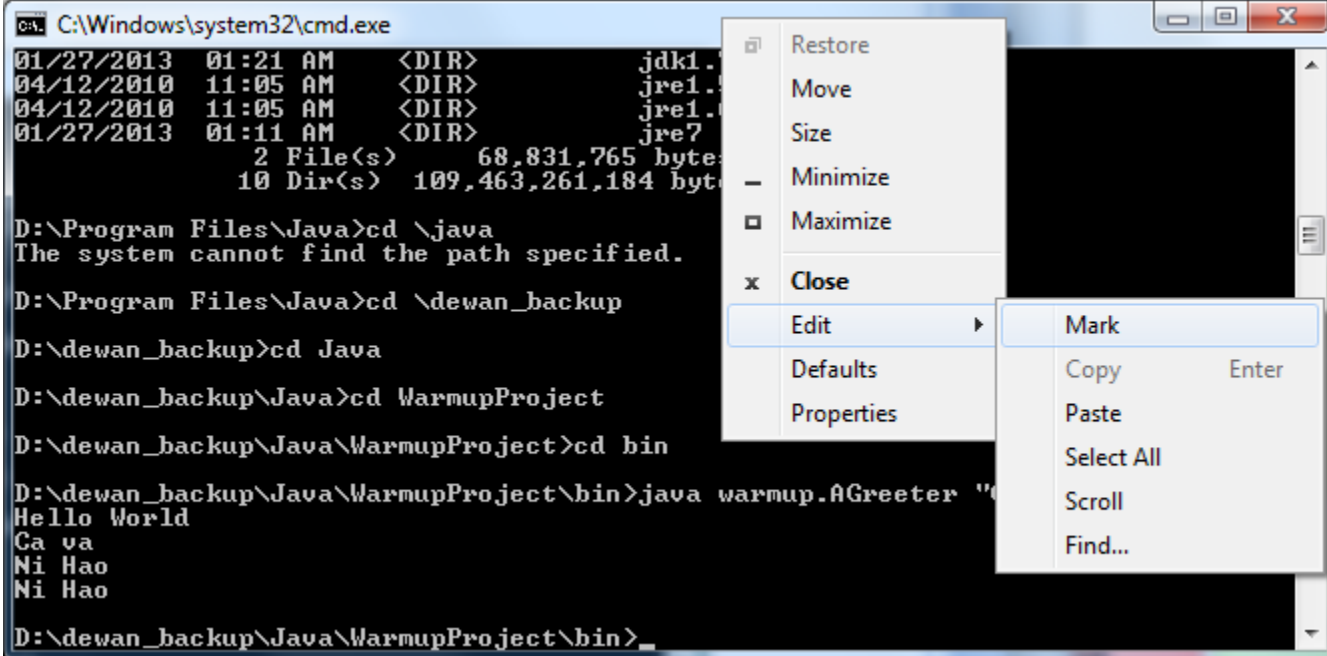
```
C:\Windows\system32\cmd.exe
01/27/2013 01:21 AM <DIR> jdk1.7.0_11
04/12/2010 11:05 AM <DIR> jre1.5.0_11
04/12/2010 11:05 AM <DIR> jre1.6.0_03
01/27/2013 01:11 AM <DIR> jre7
      2 File(s)      68,831,765 bytes
     10 Dir(s)  109,463,261,184 bytes free

D:\Program Files\Java>cd \java
The system cannot find the path specified.

D:\Program Files\Java>cd \dewan_backup
D:\dewan_backup>cd Java
D:\dewan_backup\Java>cd WarmupProject
D:\dewan_backup\Java\WarmupProject>cd bin
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va"
Hello World
Ca va
Ni Hao
Ni Hao
D:\dewan_backup\Java\WarmupProject\bin>
```

Input

MARKING TEXT



The screenshot shows a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The command history and output are as follows:

```
01/27/2013 01:21 AM <DIR> jdk1.
04/12/2010 11:05 AM <DIR> jre1.
04/12/2010 11:05 AM <DIR> jre1.
01/27/2013 01:11 AM <DIR> jre7
      2 File(s)      68,831,765 byte
     10 Dir(s)    109,463,261,184 byt

D:\Program Files\Java>cd \java
The system cannot find the path specified.

D:\Program Files\Java>cd \dewan_backup

D:\dewan_backup>cd Java

D:\dewan_backup\Java>cd WarmupProject

D:\dewan_backup\Java\WarmupProject>cd bin

D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "
Hello World
Ca va
Ni Hao
Ni Hao

D:\dewan_backup\Java\WarmupProject\bin>_
```

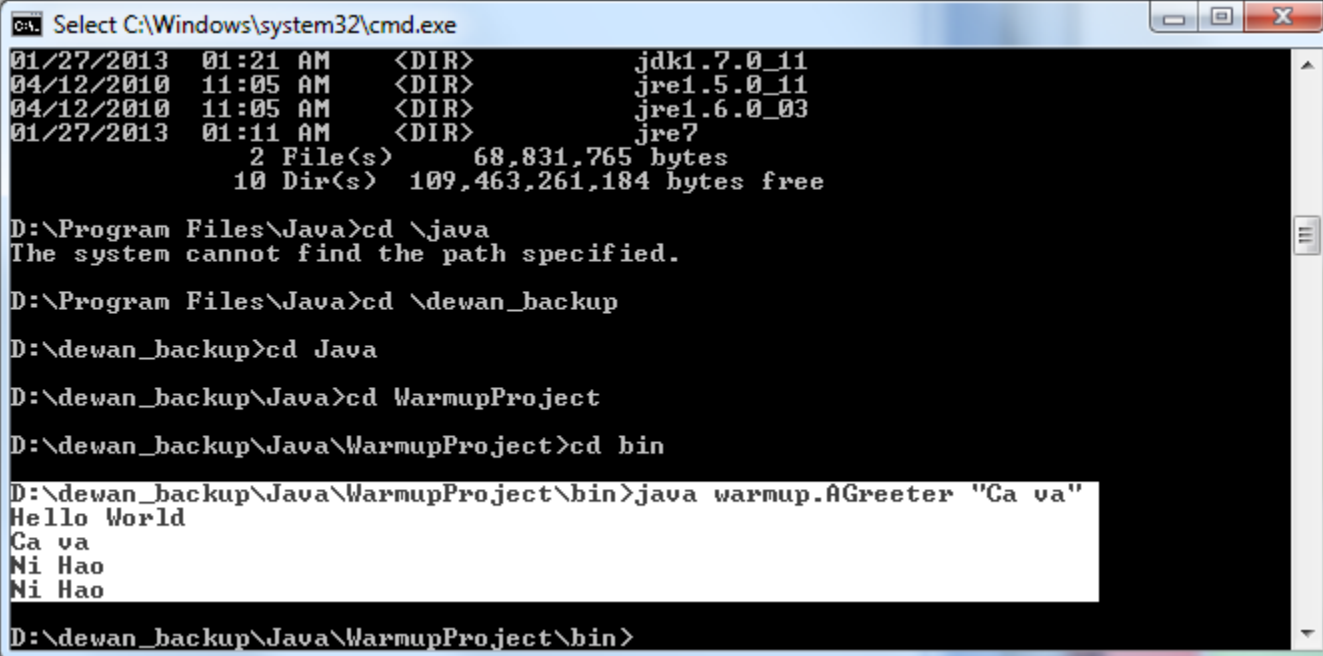
A context menu is open over the command prompt, showing the following options:

- Restore
- Move
- Size
- Minimize
- Maximize
- Close
- Edit (highlighted)
- Defaults
- Properties

The "Edit" menu is further expanded, showing the following options:

- Mark (highlighted)
- Copy
- Paste
- Select All
- Scroll
- Find...

MARKING TEXT



A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The window shows a series of directory navigation commands and their outputs. The text "Hello World", "Ca va", "Ni Hao", and "Ni Hao" is highlighted with a white selection box. The command prompt shows the following sequence of commands and outputs:

```
01/27/2013 01:21 AM <DIR> jdk1.7.0_11
04/12/2010 11:05 AM <DIR> jre1.5.0_11
04/12/2010 11:05 AM <DIR> jre1.6.0_03
01/27/2013 01:11 AM <DIR> jre7
      2 File(s)      68,831,765 bytes
     10 Dir(s)  109,463,261,184 bytes free

D:\Program Files\Java>cd \java
The system cannot find the path specified.

D:\Program Files\Java>cd \dewan_backup

D:\dewan_backup>cd Java

D:\dewan_backup\Java>cd WarmupProject

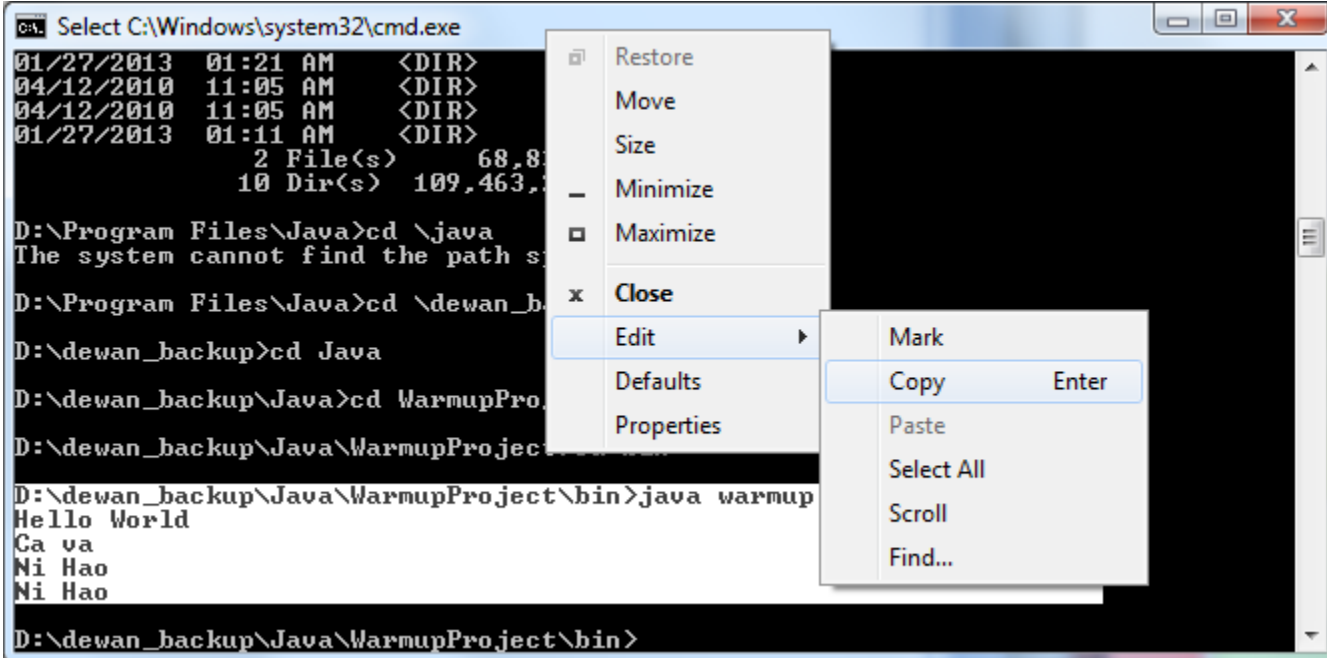
D:\dewan_backup\Java\WarmupProject>cd bin

D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va"
Hello World
Ca va
Ni Hao
Ni Hao

D:\dewan_backup\Java\WarmupProject\bin>
```

Drag mouse to select text

COPY TEXT



The screenshot shows a Windows command prompt window titled "Select C:\Windows\system32\cmd.exe". The command history includes several directory listings and navigation commands. The current directory is `D:\dewan_backup\Java\WarmupProject\bin`. The command `java warmup` has been executed, resulting in the output: `Hello World`, `Ca va`, `Ni Hao`, and `Ni Hao`. A context menu is open over the text "Hello World", with the "Copy" option highlighted. The menu also includes options like "Restore", "Move", "Size", "Minimize", "Maximize", "Close", "Edit", "Defaults", "Properties", "Mark", "Paste", "Select All", "Scroll", and "Find...".

```
01/27/2013 01:21 AM <DIR>
04/12/2010 11:05 AM <DIR>
04/12/2010 11:05 AM <DIR>
01/27/2013 01:11 AM <DIR>
      2 File(s)      68,8
     10 Dir(s)  109,463,3
D:\Program Files\Java>cd \java
The system cannot find the path s
D:\Program Files\Java>cd \dewan_b
D:\dewan_backup>cd Java
D:\dewan_backup\Java>cd WarmupPro
D:\dewan_backup\Java\WarmupProject
D:\dewan_backup\Java\WarmupProject\bin>java warmup
Hello World
Ca va
Ni Hao
Ni Hao
D:\dewan_backup\Java\WarmupProject\bin>
```

This text can now be
pasted anywhere

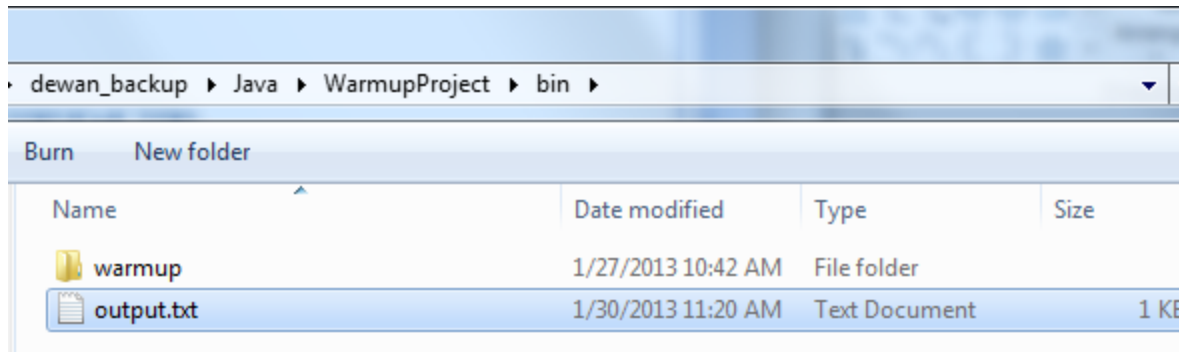
OUTPUT REDIRECTION

Input

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" > file1.txt  
Ni hao
```

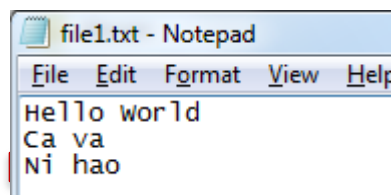
Command > File

Output of *Command* goes to *File* rather than the command window



Name	Date modified	Type	Size
warmup	1/27/2013 10:42 AM	File folder	
output.txt	1/30/2013 11:20 AM	Text Document	1 KB

Echoed Input of
"Ca va"
command



```
file1.txt - Notepad  
File Edit Format View Help  
Hello world  
Ca va  
Ni hao
```

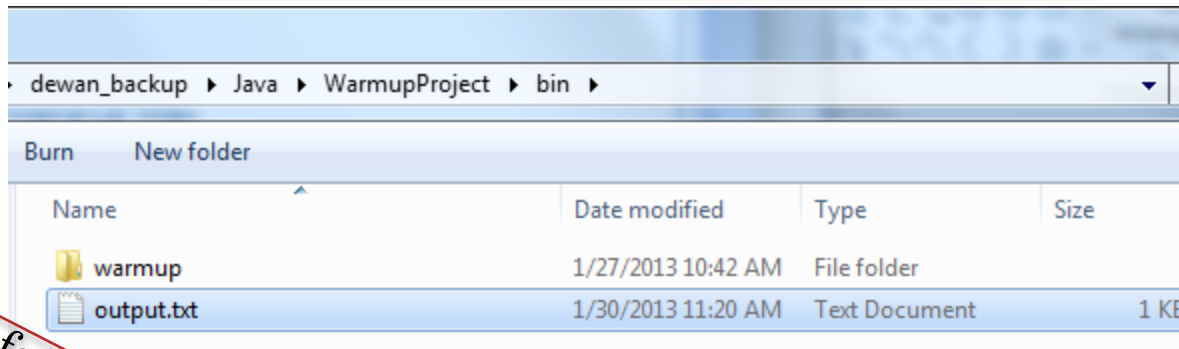
INPUT REDIRECTION

Echoed
input
from file

```
J:\devan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Buon Giorno" < file  
Hello World  
Buon Giorno  
Hello World
```

Command < File

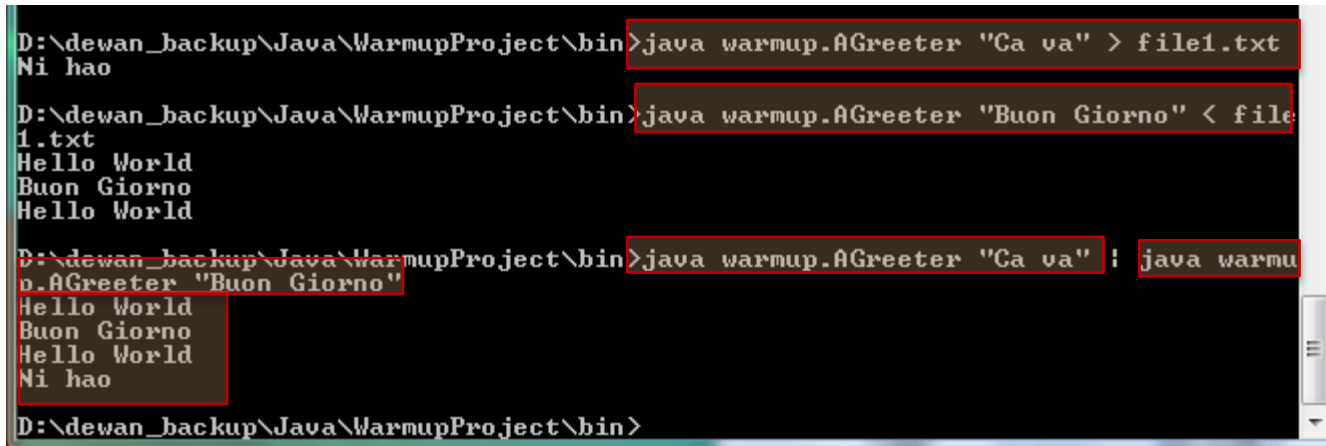
Input of *Command* comes from *File* rather
than the command window



Input for
"Buon Girono
Command"

file1.txt - Notepad
File Edit Format View Help
Hello world
Ca va
Ni hao

PIPE



The screenshot shows a Windows command prompt window with the following commands and output:

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" > file1.txt
Ni hao

D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Buon Giorno" < file1.txt
Hello World
Buon Giorno
Hello World

D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" | java warmup.AGreeter "Buon Giorno"
Hello World
Buon Giorno
Hello World
Ni hao

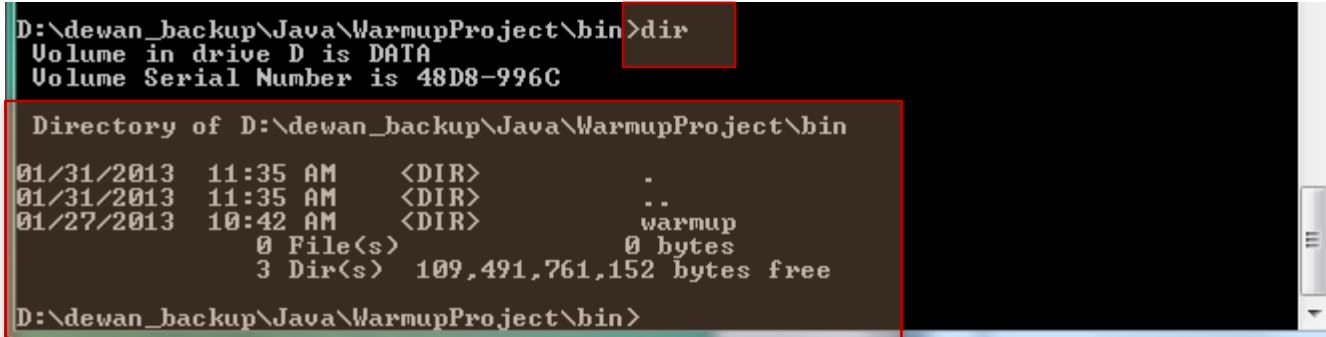
D:\dewan_backup\Java\WarmupProject\bin>
```

The output of the first command is "Ni hao". The output of the second command is "Hello World", "Buon Giorno", and "Hello World". The output of the third command is "Hello World", "Buon Giorno", "Hello World", and "Ni hao".

Command1 | *Command2*

Output of *Command1* becomes input of *Command2*

GUI ALTERNATIVE: DIR COMMAND



```
D:\dewan_backup\Java\WarmupProject\bin>dir
Volume in drive D is DATA
Volume Serial Number is 48D8-996C

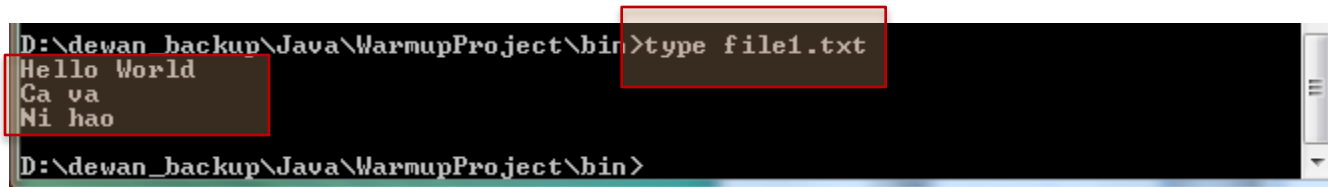
Directory of D:\dewan_backup\Java\WarmupProject\bin

01/31/2013  11:35 AM    <DIR>          .
01/31/2013  11:35 AM    <DIR>          ..
01/27/2013  10:42 AM    <DIR>          warmup
           0 File(s)              0 bytes
           3 Dir(s)  109,491,761,152 bytes free

D:\dewan_backup\Java\WarmupProject\bin>
```

The screenshot shows a Windows command prompt window with a black background and white text. The command 'dir' has been executed in the directory 'D:\dewan_backup\Java\WarmupProject\bin'. The output displays the volume information for drive D (DATA, serial number 48D8-996C) and a detailed directory listing. The listing shows three entries: a current directory '.', a parent directory '..', and a subdirectory 'warmup' created on 01/27/2013 at 10:42 AM. Below the directory listing, it shows '0 File(s) 0 bytes' and '3 Dir(s) 109,491,761,152 bytes free'. The prompt 'D:\dewan_backup\Java\WarmupProject\bin>' is visible at the bottom.

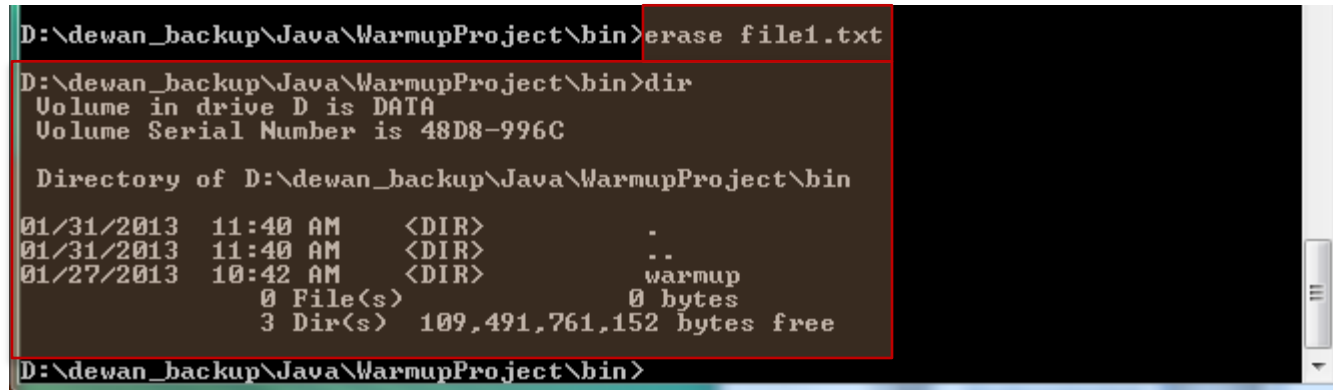
GUI ALTERNATIVE: TYPE COMMAND



A screenshot of a Windows command prompt window. The title bar is not visible. The command prompt shows the current directory as `D:\dewan_backup\Java\WarmupProject\bin`. The command `>type file1.txt` has been entered. The output of the command is displayed on the next three lines: `Hello World`, `Ca va`, and `Ni hao`. The prompt `D:\dewan_backup\Java\WarmupProject\bin>` is visible at the bottom of the window. There are two red rectangular boxes: one highlighting the command `>type file1.txt` and another highlighting the output lines `Hello World`, `Ca va`, and `Ni hao`.

```
D:\dewan_backup\Java\WarmupProject\bin>type file1.txt
Hello World
Ca va
Ni hao
D:\dewan_backup\Java\WarmupProject\bin>
```

GUI ALTERNATIVE: ERASE COMMAND



```
D:\dewan_backup\Java\WarmupProject\bin>erase file1.txt  
D:\dewan_backup\Java\WarmupProject\bin>dir  
Volume in drive D is DATA  
Volume Serial Number is 48D8-996C  
  
Directory of D:\dewan_backup\Java\WarmupProject\bin  
01/31/2013  11:40 AM    <DIR>          .  
01/31/2013  11:40 AM    <DIR>          ..  
01/27/2013  10:42 AM    <DIR>          warmup  
           0 File(s)              0 bytes  
           3 Dir(s)  109,491,761,152 bytes free  
D:\dewan_backup\Java\WarmupProject\bin>
```


GUI ALTERNATIVE: MKDIR COMMAND

```
D:\dewan_backup\Java\WarmupProject\bin>mkdir test
```

```
D:\dewan_backup\Java\WarmupProject\bin>dir
```

Volume in drive D is DATA

Volume Serial Number is 48D8-996C

Directory of D:\dewan_backup\Java\WarmupProject\bin

01/31/2013	11:41 AM	<DIR>	.
01/31/2013	11:41 AM	<DIR>	..
01/31/2013	11:41 AM	<DIR>	test
01/27/2013	10:42 AM	<DIR>	warmup
		0 File(s)	0 bytes
		4 Dir(s)	109,491,761,152 bytes free

```
D:\dewan_backup\Java\WarmupProject\bin>
```

WILDCARD: *

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" > file1.txt
Ni Hao

D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Buon Giorno" > file
2.txt
Nanaste

D:\dewan_backup\Java\WarmupProject\bin>type *
file1.txt

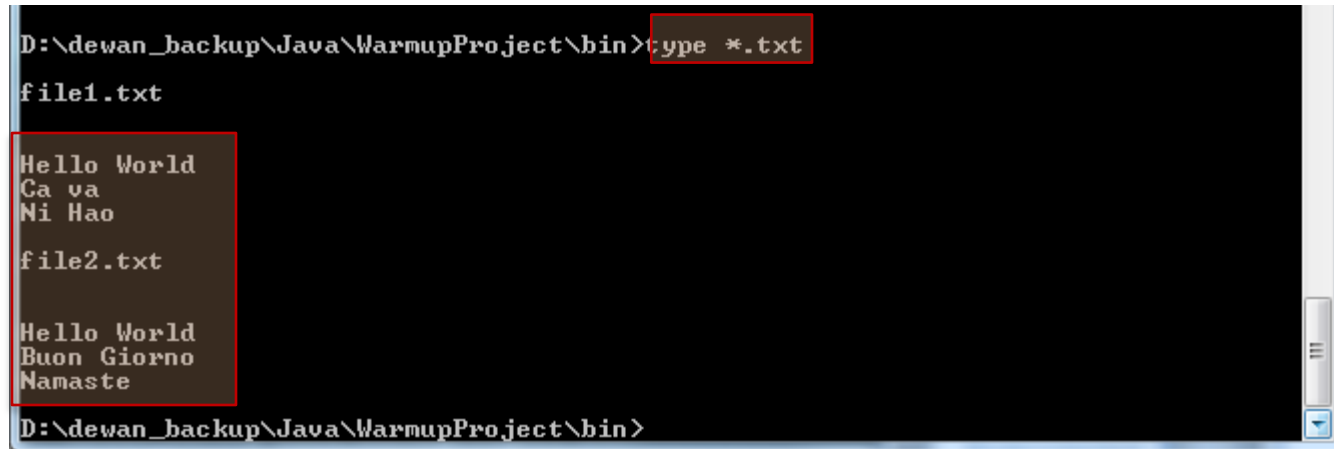
Hello World
Ca va
Ni Hao

file2.txt

Hello World
Buon Giorno
Nanaste

D:\dewan_backup\Java\WarmupProject\bin>
```

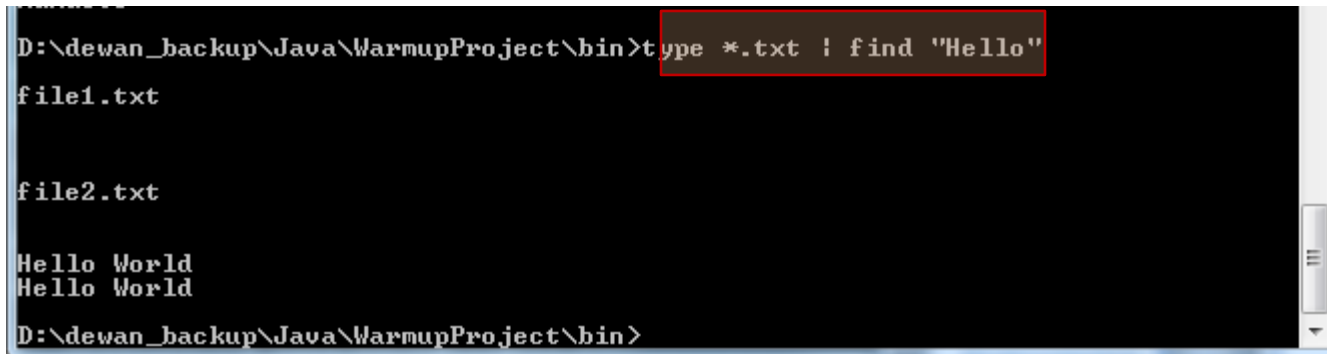
WILDCARD: *



```
D:\dewan_backup\Java\WarmupProject\bin>type *.txt
file1.txt
Hello World
Ca va
Ni Hao
file2.txt
Hello World
Buon Giorno
Namaste
D:\dewan_backup\Java\WarmupProject\bin>
```

The screenshot shows a Windows command prompt window. The command `type *.txt` is entered at the prompt, with the command text highlighted by a red rectangular box. The output of the command is displayed on the next line, listing `file1.txt` and `file2.txt`, followed by their contents. The contents of `file1.txt` are `Hello World`, `Ca va`, and `Ni Hao`. The contents of `file2.txt` are `Hello World`, `Buon Giorno`, and `Namaste`. The output text is also highlighted by a red rectangular box. The prompt then returns to `D:\dewan_backup\Java\WarmupProject\bin>`.

PARTIAL WILDCARD AND FIND (PIPED)

A screenshot of a Windows command prompt window. The title bar is partially visible at the top. The command prompt shows the following text:
D:\dewan_backup\Java\WarmupProject\bin>type *.txt | find "Hello"
file1.txt

file2.txt

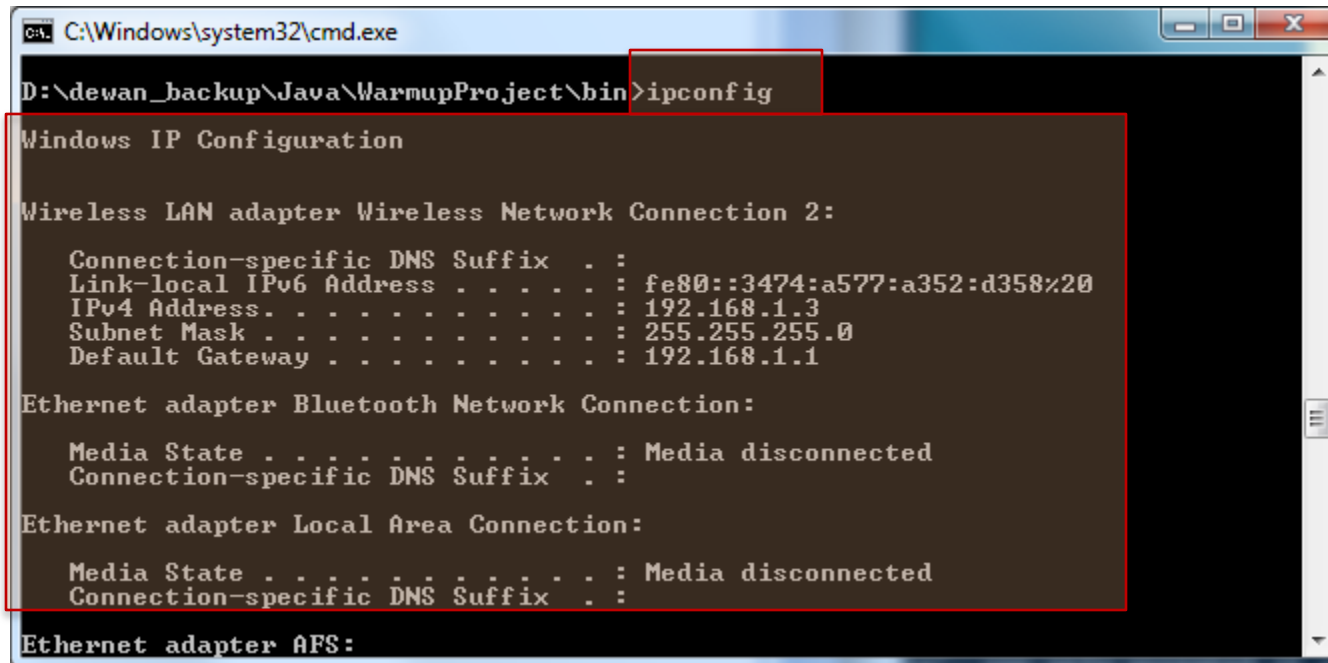
Hello World
Hello World
D:\dewan_backup\Java\WarmupProject\bin>
The command 'type *.txt | find "Hello"' is highlighted with a red rectangular box. The output shows two files, file1.txt and file2.txt, both containing the text 'Hello World'.

```
D:\dewan_backup\Java\WarmupProject\bin>type *.txt | find "Hello"
file1.txt

file2.txt

Hello World
Hello World
D:\dewan_backup\Java\WarmupProject\bin>
```

IPCONFIG



```
C:\Windows\system32\cmd.exe
D:\dewan_backup\Java\WarmupProject\bin>ipconfig

Windows IP Configuration

Wireless LAN adapter Wireless Network Connection 2:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::3474:a577:a352:d358%20
    IPv4 Address. . . . . : 192.168.1.3
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

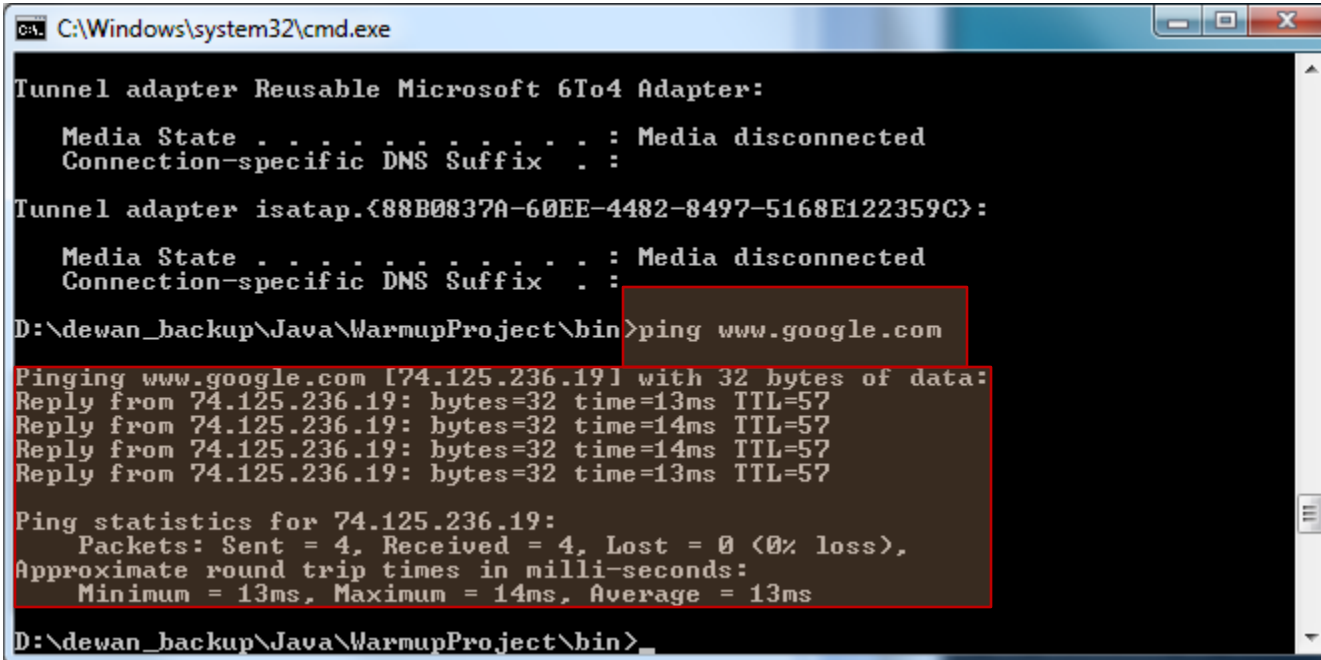
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Ethernet adapter Local Area Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Ethernet adapter AFS:
```

PING



```
C:\Windows\system32\cmd.exe

Tunnel adapter Reusable Microsoft 6To4 Adapter:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Tunnel adapter isatap.{88B0837A-60EE-4482-8497-5168E122359C}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

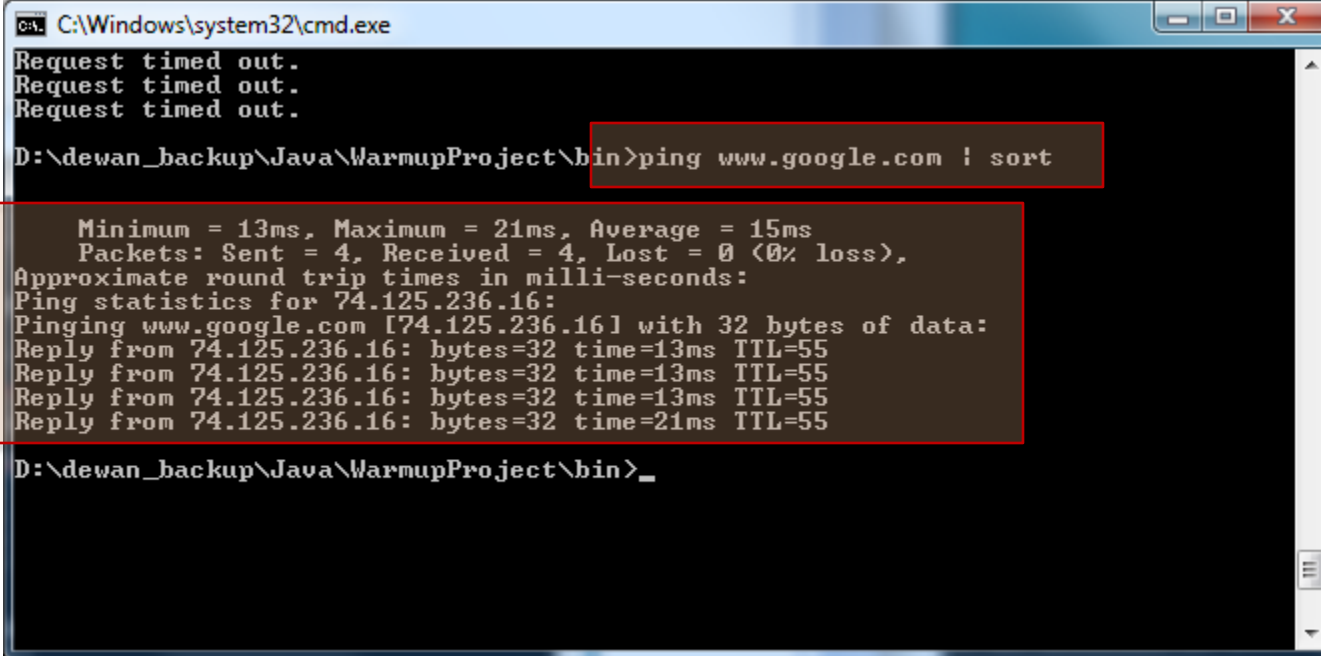
D:\dewan_backup\Java\WarmupProject\bin>ping www.google.com

Pinging www.google.com [74.125.236.19] with 32 bytes of data:
Reply from 74.125.236.19: bytes=32 time=13ms TTL=57
Reply from 74.125.236.19: bytes=32 time=14ms TTL=57
Reply from 74.125.236.19: bytes=32 time=14ms TTL=57
Reply from 74.125.236.19: bytes=32 time=13ms TTL=57

Ping statistics for 74.125.236.19:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 13ms, Maximum = 14ms, Average = 13ms

D:\dewan_backup\Java\WarmupProject\bin>
```

SORT (PIPED)



A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The window shows the output of a ping command piped to the sort command. The output is as follows:

```
Request timed out.
Request timed out.
Request timed out.

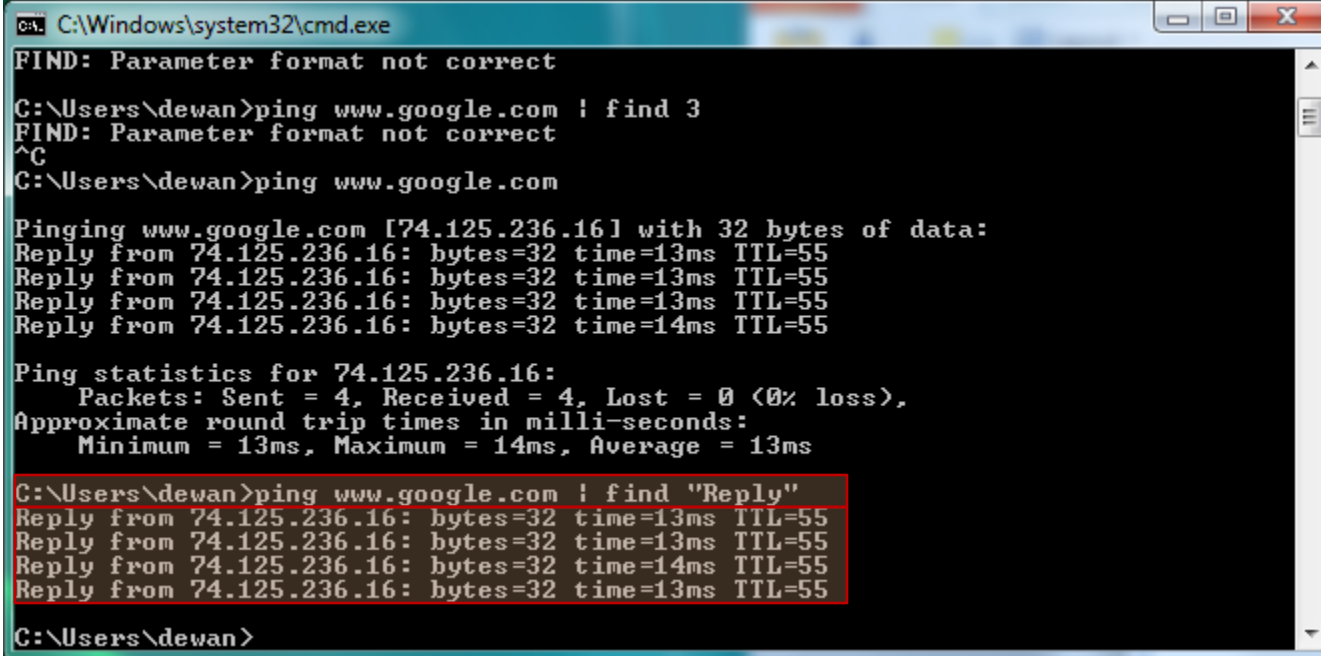
D:\dewan_backup\Java\WarmupProject\bin>ping www.google.com | sort

    Minimum = 13ms, Maximum = 21ms, Average = 15ms
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Ping statistics for 74.125.236.16:
Pinging www.google.com [74.125.236.16] with 32 bytes of data:
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=21ms TTL=55

D:\dewan_backup\Java\WarmupProject\bin>_
```

The output is displayed in a black console window with white text. The command prompt shows the directory path "D:\dewan_backup\Java\WarmupProject\bin" and the command "ping www.google.com | sort". The output shows the results of the ping command, including the minimum, maximum, and average round trip times, and the statistics for the ping command.

FIND(PIPED)



```
C:\Windows\system32\cmd.exe
FIND: Parameter format not correct

C:\Users\dewan>ping www.google.com | find 3
FIND: Parameter format not correct
^C
C:\Users\dewan>ping www.google.com

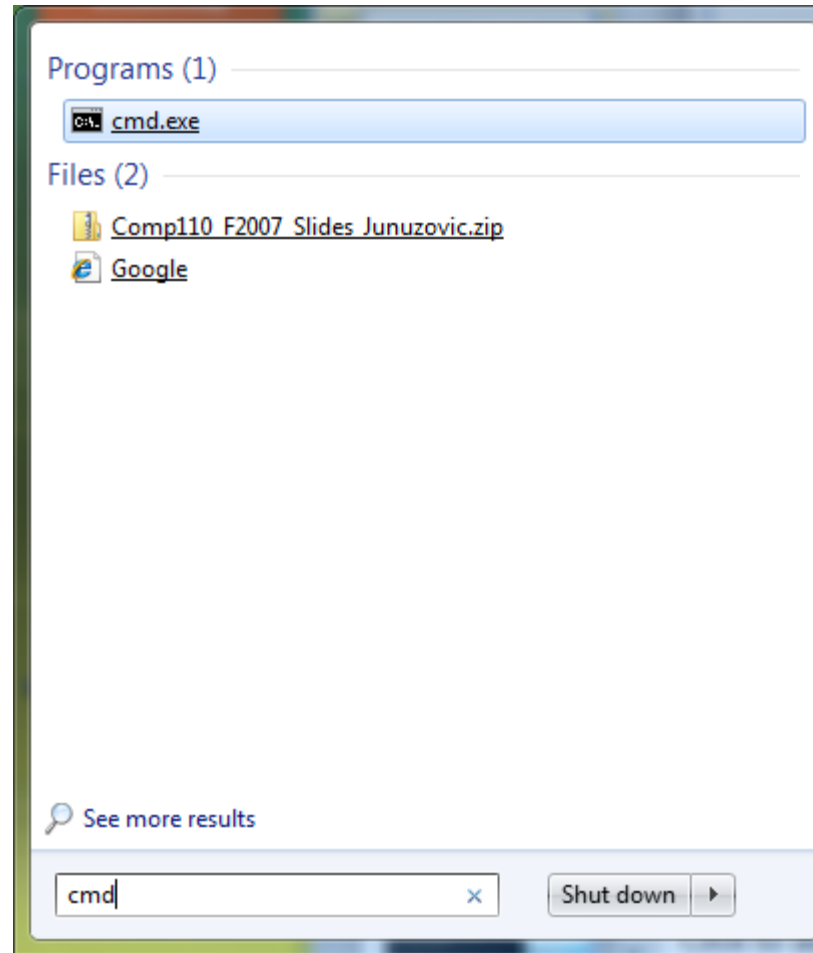
Pinging www.google.com [74.125.236.16] with 32 bytes of data:
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=14ms TTL=55

Ping statistics for 74.125.236.16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 13ms, Maximum = 14ms, Average = 13ms

C:\Users\dewan>ping www.google.com | find "Reply"
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55
Reply from 74.125.236.16: bytes=32 time=14ms TTL=55
Reply from 74.125.236.16: bytes=32 time=13ms TTL=55

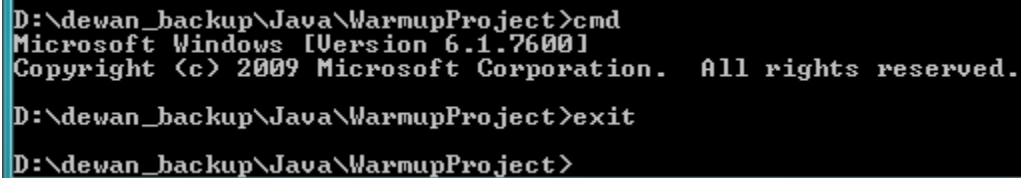
C:\Users\dewan>
```


STARTING SEPARATE COMMAND INTERPRETER



EXTRA SLIDES

STARTING ANOTHER COMMAND INTERPRETER IN SAME WINDOW AND EXIT



```
D:\dewan_backup\Java\WarmupProject>cmd
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

D:\dewan_backup\Java\WarmupProject>exit

D:\dewan_backup\Java\WarmupProject>
```

COMMAND INTERPRETER?

Interprets Command Lines

Provides alternative to (OS and
Application) GUIs

```
D:\dewan_backup\Java\WarmupProject>javac -d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```

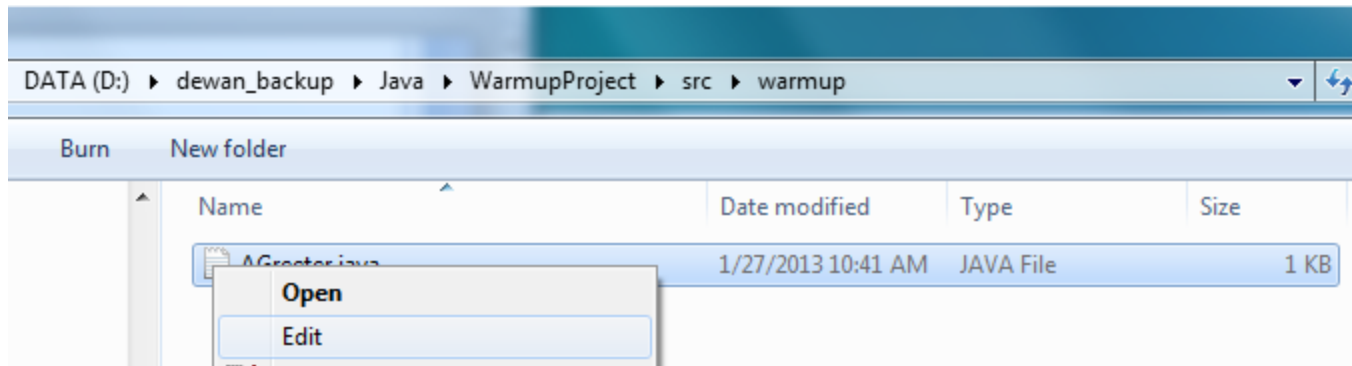
WHY COMMAND INTERPRETER

Command lines may be preferred to GUIs

Some applications and OS's do not come with GUIs and must be used through command interpreter

java, javac, kindlegen

GUI ALTERNATIVE



GUI

```
D:\dewan_backup\Java\WarmupProject>dir src\warmup
Volume in drive D is DATA
Volume Serial Number is 48D8-996C

Directory of D:\dewan_backup\Java\WarmupProject\src\warmup

01/27/2013  09:52 AM    <DIR>          .
01/27/2013  09:52 AM    <DIR>          ..
01/27/2013  10:41 AM                547 AGreeter.java
               1 File(s)                547 bytes
               2 Dir(s)  109,464,555,520 bytes free

D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java
D:\dewan_backup\Java\WarmupProject>
```

Command Interpreter

Command interpreters came first

COMMAND NAME RELATIVE TO FOLDER IN PATH

```
D:\dewan_backup\Java\WarmupProject>javac -d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```

ADVANCE

```
D:\dewan_backup\Java\WarmupProject>javac -d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```


RELATIVE NAME

Relative to current directory (or folder)

Can used in both command names and file parameters

The diagram illustrates the use of relative paths in a command. A central command string is shown: `"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin`. Below the command, the file `AGreeter.java` is listed. Three blue arrows originate from the text 'Can used in both command names and file parameters' above. One arrow points to the `javac` command name, another points to the output directory `D:\dewan_backup\Java\WarmupProject\bin`, and a third points to the file `AGreeter.java`. The paths in the command are highlighted with red boxes.

```
"D:\Program Files\Java\jdk1.7.0_11\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin  
AGreeter.java
```

Used only in command names

Relative to folders in System Path

RELATIVE NAME: GOING BACKWARD

A .. After some directory D refers to the parent of the D

```
D:\dewan_backup>cd Java\WarmupProject
D:\dewan_backup\Java\WarmupProject>_
```

Relative name: ... denotes a file with absolute name: d\f

Relative name: src\warmup\AGreeter.java denotes a file with absolute name "D:\dewan_backup\Java\WarmupProject>\src\warmup\AGreeter.java"

...

Relative to current directory (or folder)

Given current directory with absolute name: d

Given current directory with absolute name:
"D:\dewan_backup\Java\WarmupProject>"

Relative name: f denotes a file with absolute name: d\f

Relative name: src\warmup\AGreeter.java denotes a file with
absolute name "D:\dewan_backup\Java\WarmupProject>"\
src\warmup\AGreeter.java

RELATIVE/PARTIAL VS. ABSOLUTE/FULL NAMES

```
javac -d bin src\warmup\AGreeter.java
```

```
D:\dewan_backup\Java\WarmupProject\src\warmup>"D:\Program Files\Java\jdk1.7.0_11  
\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java
```

```
D:\Program Files\Java\jdk1.7.0_11  
\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java
```

TOKENIZATION

```
D:\dewan_backup\Java\WarmupProject>D:\Program Files\Java\jdk1.7.0_11\bin\javac--  
d D:/dewan_backup/Java/WarmupProject/bin AGreeter.java  
'D:\Program' is not recognized as an internal or external command,  
operable program or batch file.
```

D:\dewan_backup\Java\WarmupProject\src\warmup>D:\Program Files\Java\jdk1.7.0_11
\bin\javac -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java

First token = command-name

D:\dewan_backup\Java\WarmupProject\src\warmup>"D:\Program Files\Java\jdk1.7.0_11
\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java

USING QUOTES TO SEPARATE TOKENS

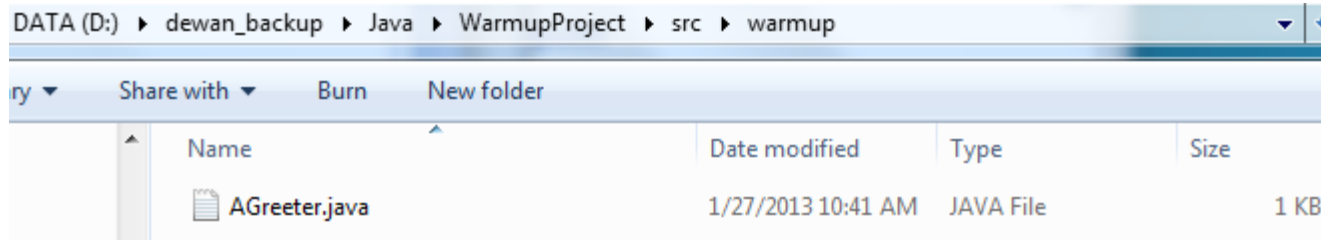
```
D:\dewan_backup\Java\WarmupProject>D:\Program Files\Java\jdk1.7.0_11\bin\javac--  
d D:/dewan_backup/Java/WarmupProject/bin AGreeter.java  
'D:\Program' is not recognized as an internal or external command,  
operable program or batch file.
```

```
D:\dewan_backup\Java\WarmupProject\src\warmup>"D:\Program Files\Java\jdk1.7.0_11  
\bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java
```

First token = command-name

GUI ALTERNATIVE

GUI



Command Interpreter

```
D:\dewan_backup\Java\WarmupProject>dir src\warmup
Volume in drive D is DATA
Volume Serial Number is 48D8-996C

Directory of D:\dewan_backup\Java\WarmupProject\src\warmup

01/27/2013  09:52 AM    <DIR>          .
01/27/2013  09:52 AM    <DIR>          ..
01/27/2013  10:41 AM                547 AGreeter.java
               1 File(s)                547 bytes
               2 Dir(s)  109,464,555,520 bytes free
```

Command interpreters came first

TOKENIZATION

```
D:\dewan_backup\Java\WarmupProject>D:\Program Files\Java\jdk1.7.0_11\bin\javac -  
d bin src\warmup\AGreeter.java  
'D:\Program' is not recognized as an internal or external command,  
operable program or batch file.  
D:\dewan_backup\Java\WarmupProject>
```

D:\dewan_backup\Java\WarmupProject>D:\Program Files\Java\jdk1.7.0_11\bin\javac -
d bin src\warmup\AGreeter.java

First token = command-name

RELATIVE NAME: GOING FORWARD

Relative to current directory (or folder)

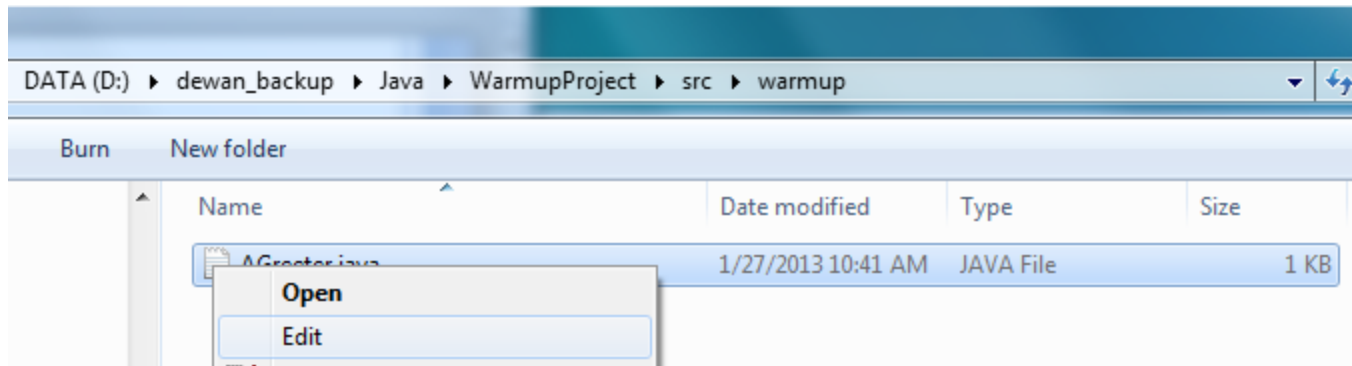
Given current directory with absolute name: d

Given current directory with absolute name:
D:\dewan_backup\Java\WarmupProject>

Relative name: f denotes a file with absolute name: d\f

Relative name: src\warmup\AGreeter.java denotes a file with
absolute name D:\dewan_backup\Java\WarmupProject>\
src\warmup\AGreeter.java

GUI ALTERNATIVE



GUI

```
D:\dewan_backup\Java\WarmupProject>dir src\warmup
Volume in drive D is DATA
Volume Serial Number is 48D8-996C

Directory of D:\dewan_backup\Java\WarmupProject\src\warmup

01/27/2013  09:52 AM    <DIR>          .
01/27/2013  09:52 AM    <DIR>          ..
01/27/2013  10:41 AM                547 AGreeter.java
               1 File(s)                547 bytes
               2 Dir(s)  109,464,555,520 bytes free

D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java
D:\dewan_backup\Java\WarmupProject>
```

Command Interpreter

Command interpreters came first

CLASSIFYING COMMAND-NAMES

Internal

cd

Identify code built-into OS

External

javac

Identify some application
program installed on top of OS

Command interpreter does not know about external
command names; so how does it run and interpret them?

RELATIVE/PARTIAL VS. ABSOLUTE/FULL NAMES

```
D:\dewan_backup\Java\WarmupProject\src\warmup>"D:\Program Files\Java\jdk1.7.0_11  
  \bin\javac" -d D:\dewan_backup\Java\WarmupProject\bin AGreeter.java
```

Absolute name

Relative name

Longer names and simpler naming
scheme

Shorter names but more
complicated naming scheme

HOW TO NAME FILES (AND FOLDERS)

One or more of the parameters may be file (and folder) names

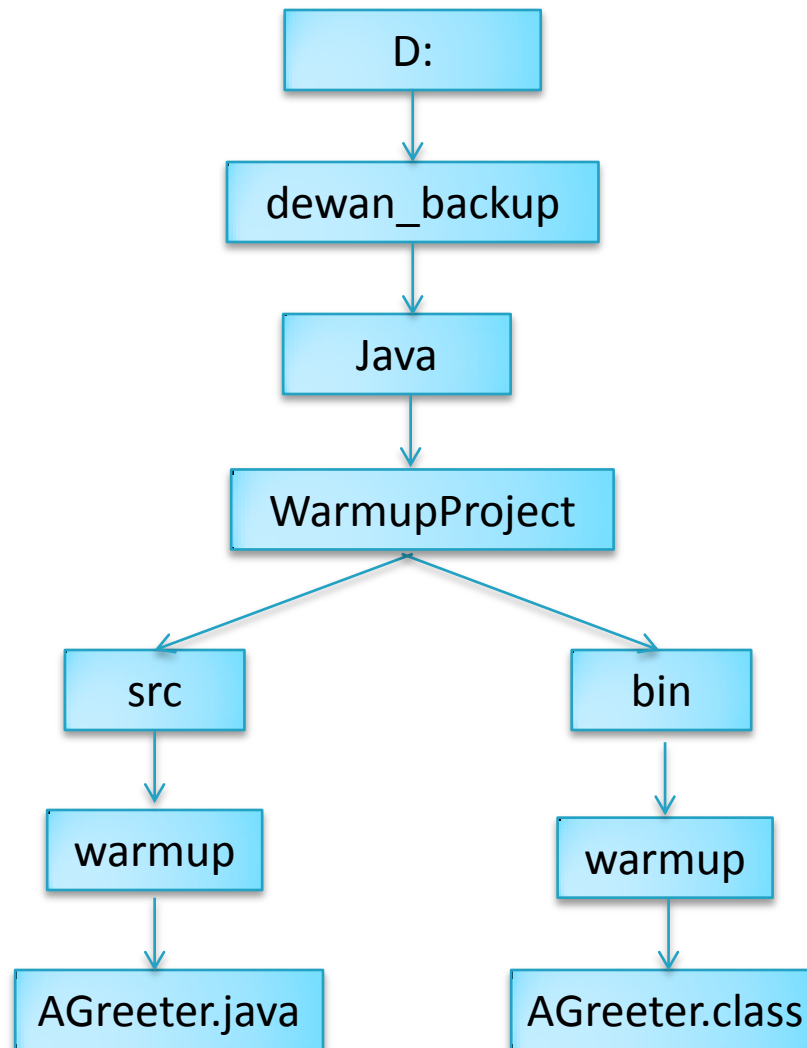
```
javac -d bin src\warmup\AGreeter.java
```

File names



Files and folders are both often called files

FILE/FOLDER HIERARCHIES AND LOCAL NAMES



COMPLETING FILE NAME

```
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac" "  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>notepad src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>"D:\Program Files\Java\jdk1.7.0_11\bin\javac" "  
-d bin src\warmup\AGreeter.java  
D:\dewan_backup\Java\WarmupProject>
```

Enter

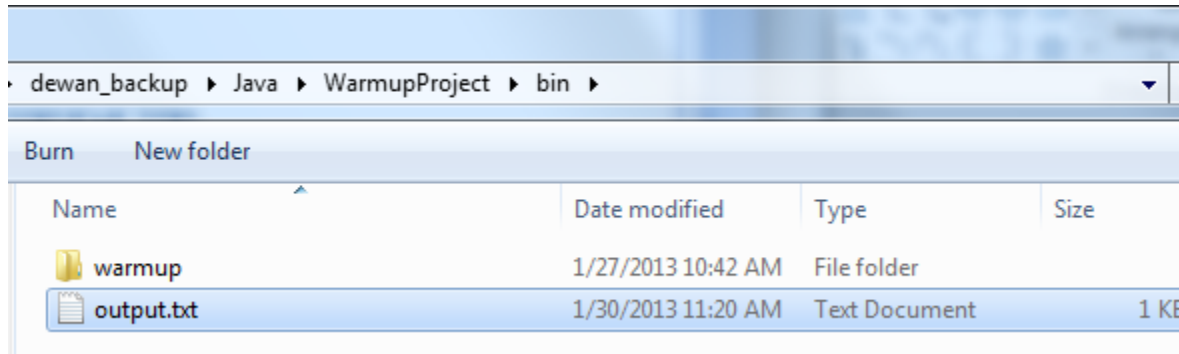
Could have edited
command

History particularly useful if absolute
files names entered

REDIRECTING OUTPUT

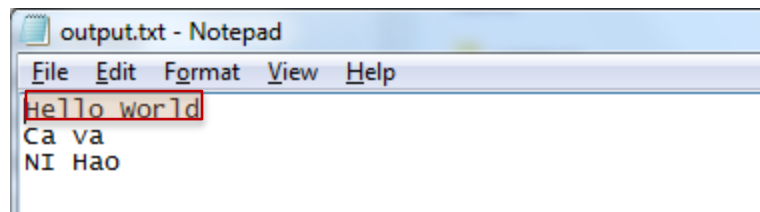
Echoed
input

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" < output.txt
Hello World
Ca va
Hello World
D:\dewan_backup\Java\WarmupProject\bin>
```



Name	Date modified	Type	Size
warmup	1/27/2013 10:42 AM	File folder	
output.txt	1/30/2013 11:20 AM	Text Document	1 KB

Input

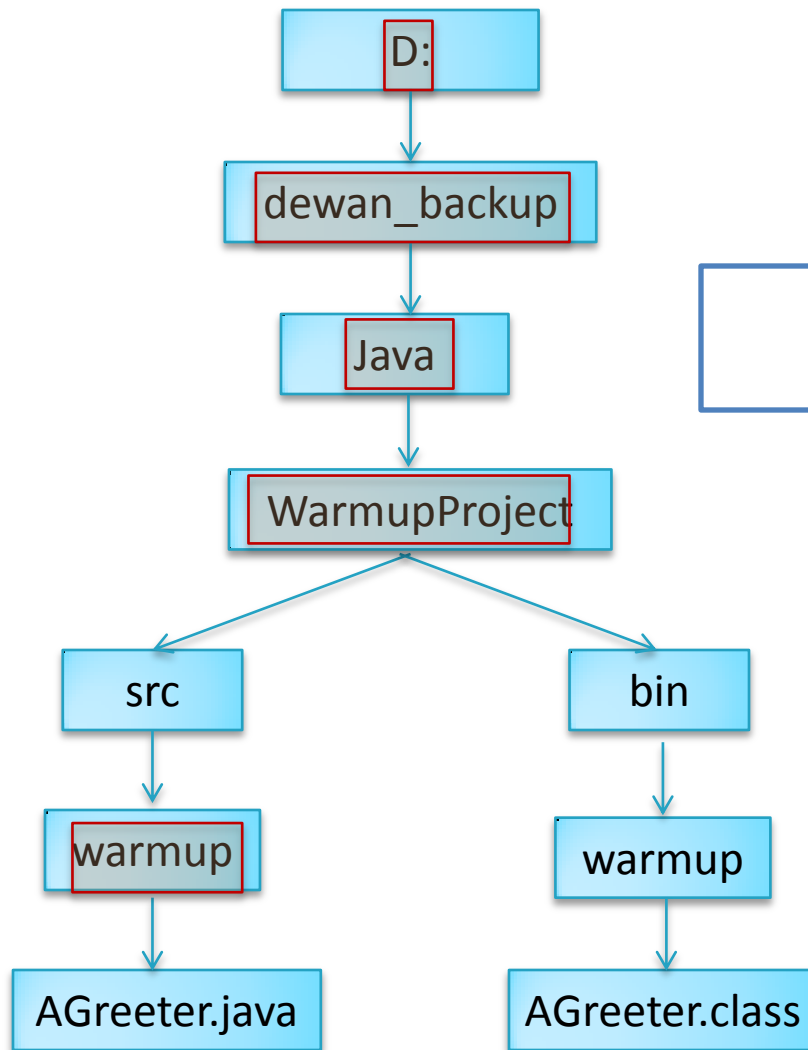


```
output.txt - Notepad
File Edit Format View Help
Hello world
Ca va
NI Hao
```

Command < File

Input of Command comes from File rather
than the command window

TRAVERSING UP (AND DOWN) THE HIERARCHY



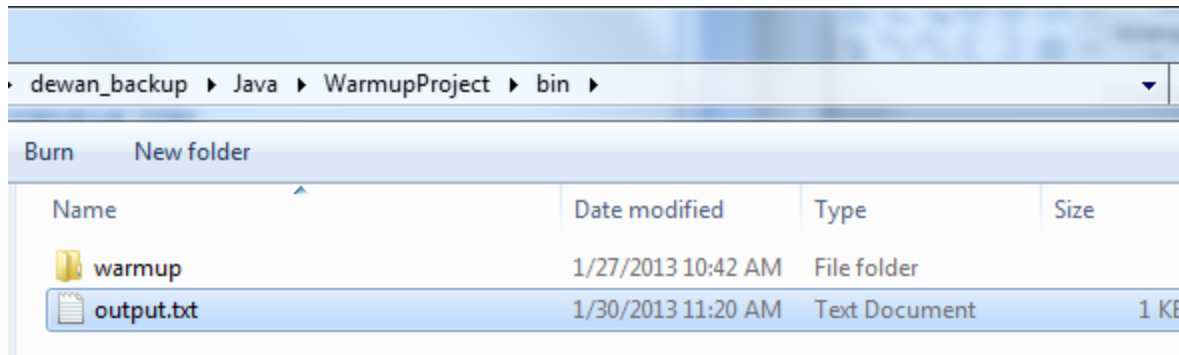
OUTPUT REDIRECTION

Input

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" > output.txt
NI Hao
D:\dewan_backup\Java\WarmupProject\bin>
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" > file1.txt
Ni hao
```

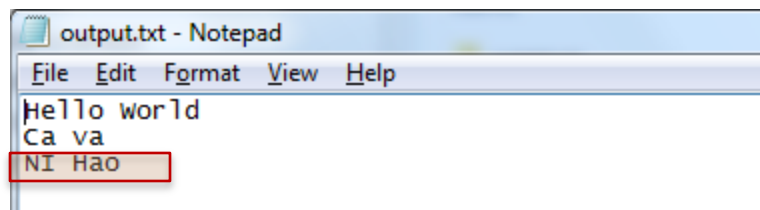
Command > File

Output of Command goes to File rather than the command window



Name	Date modified	Type	Size
warmup	1/27/2013 10:42 AM	File folder	
output.txt	1/30/2013 11:20 AM	Text Document	1 KB

Echoed Input



```
output.txt - Notepad
File Edit Format View Help
Hello world
Ca va
NI Hao
```

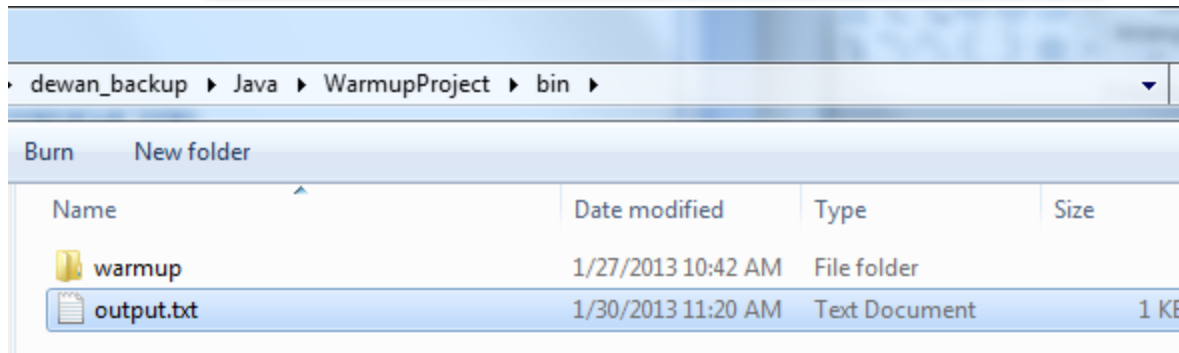
INPUT REDIRECTION

Echoed
input
from file

```
D:\dewan_backup\Java\WarmupProject\bin>java warmup.AGreeter "Ca va" < output.txt
Hello World
Ca va
Hello World
D:\dewan_backup\Java\WarmupProject\bin>
```

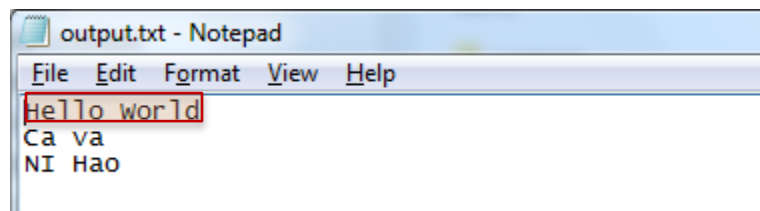
Command < File

Input of Command comes from file rather
than the command window



Name	Date modified	Type	Size
warmup	1/27/2013 10:42 AM	File folder	
output.txt	1/30/2013 11:20 AM	Text Document	1 KB

Input



```
output.txt - Notepad
File Edit Format View Help
Hello world
Ca va
NI Hao
```