



MODERN OPERATING SYSTEMS

LECTURE 5

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AGENDA

➤ BATCH FILES

- ✓ DEFINITION AND STRUCTURE
- ✓ SPECIFIC COMMANDS
- ✓ PARAMETERS
- ✓ VARIABLES

BATCH FILE

- A SEQUENCE OF COMMANDS EACH IN A SINGLE LINE, WHICH IS EXECUTED AS A ONE PROGRAM
- MUST HAVE “.CMD” (OR “.BAT”) EXTENSION
- IS DEVELOPED IN EDITORS WHICH DO NOT PLACE SPECIFIC FORMATTING (I.E. NOTEPAD IN WINDOWS)

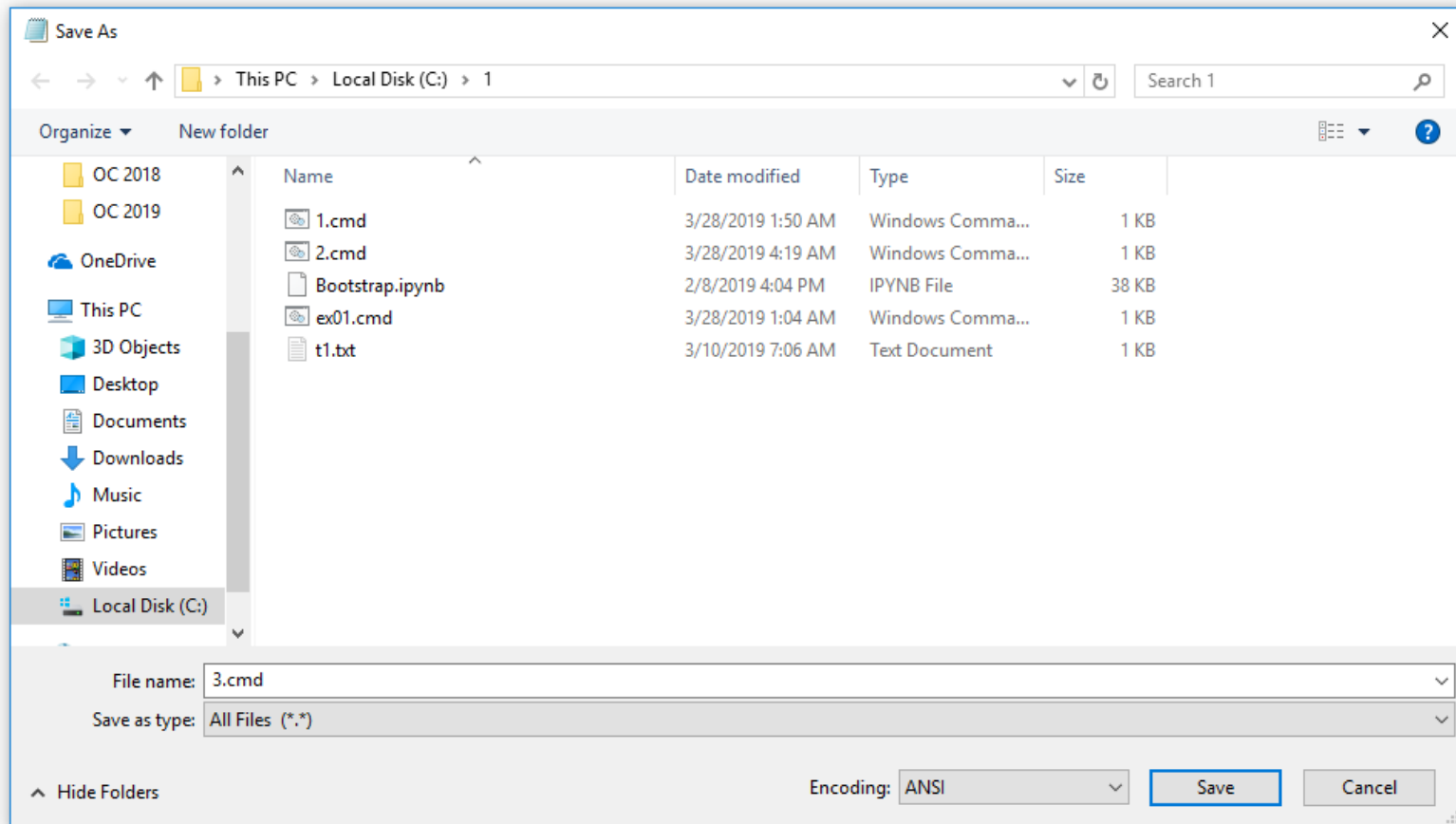
ALGORITHM OF WORK WITH A BATCH FILE

- RUN TEXT EDITOR “NOTEPAD”
- TYPE IN NECESSARY COMMANDS (EVERY COMMAND IN A SINGLE LINE)
- SAVE THIS FILE WITH .CMD, OR .BAT EXTENSION
- IN THE COMMAND PROMPT WINDOW, TYPE IN THE NAME (WITH EXTENSION) OF THE BATCH FILE (THE FULL NAME, OR “GO TO” ITS DIRECTORY)

2.cmd - Notepad

File Edit Format View Help

```
dir \  
dir *.txt  
fc /?
```



CONDITIONAL OPERATION (IF-ELSE)

THE MOST COMMON SYNTAX:

➤ IF [NOT] EXIST FILE_NAME COMMAND

(IF FILE/DIRECTORY EXISTS [DOES NOT EXIST], THE COMMAND IS EXECUTED)

EX: `C:\Windows\system32>if not exist \1\2\3\4\ mkdir \1\2\3\4`

➤ IF [NOT] "STRING1"=="STRING2" COMMAND

(IF "STRING1" IS EQUAL [IS NOT EQUAL] TO "STRING2", THEN THE COMMAND IS EXECUTED – MOSTLY USED IN BATCH FILES)

➤ IF ERRORLEVEL NUMBER COMMAND

(CHECKS THE CODE BEING RETURNED BY THE PREVIOUS COMMAND OR PROGRAM, AND IF IT IS LESS OR EQUAL TO THE "NUMBER" THE COMMAND IS EXECUTED)

SOME OTHER USEFUL COMMANDS

➤ ECHO OFF | ON (TO SWITCH OFF OR SWITCH ON ECHO OF THE SUCCEEDING COMMANDS FROM A COMMAND FILE ONTO THE SCREEN WHILE THE COMMAND FILE EXECUTING)

➤ ECHO MESSAGE (TO DISPLAY THE MESSAGE IN THE SCREEN)

```
C:\Windows\system32>echo HI, THERE  
HI, THERE
```

➤ REM – (TO MAKE A LINE IN A COMMAND FILE TO BE A COMMENT)

➤ @ - (NOT TO DISPLAY THE COMMAND FROM THIS LINE IN THE SCREEN WHILE THE COMMAND FILE EXECUTING)

➤ USUALLY, THE FIRST LINE IN A COMMAND FILE IS THE FOLLOWING:

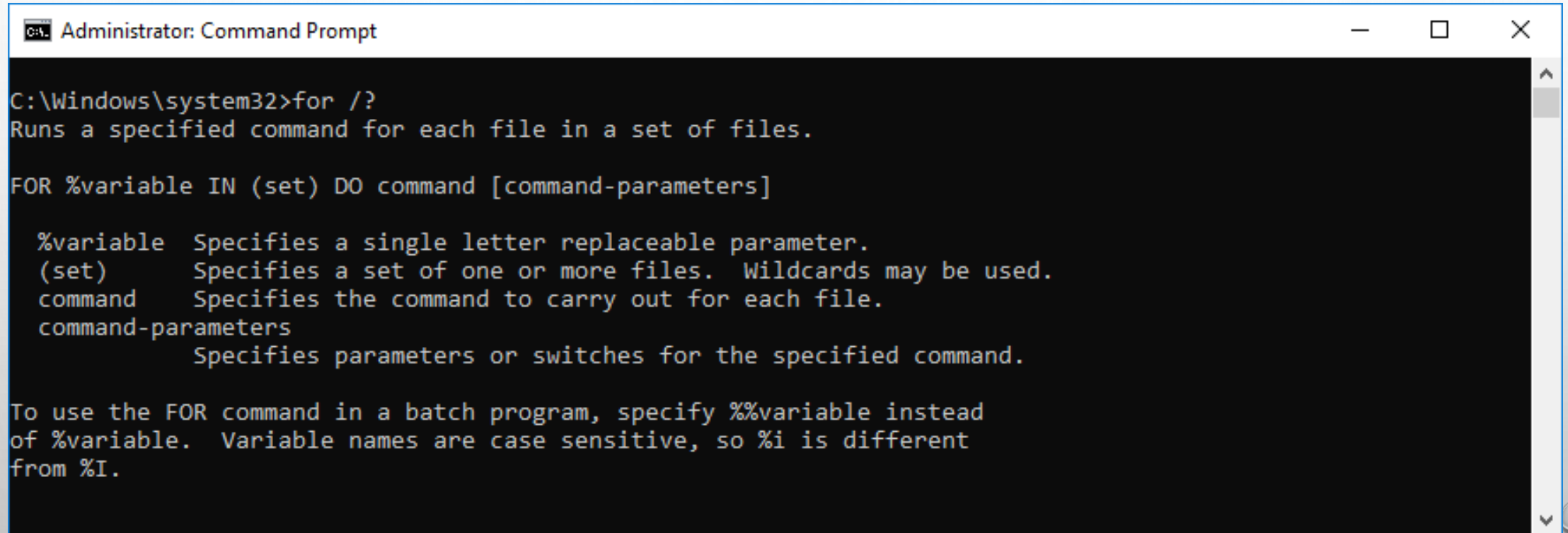
@ECHO OFF

PROHIBITS TO DISPLAY ALL THE SUCCEEDING COMMANDS (ECHO OFF ITSELF – AS WELL, BUT ALL COMMANDS OUTPUT IS SHOWN)

➤ CLS – (TO CLEAR THE COMMAND WINDOW, TO DELETE ALL THE OUTPUT INFORMATION FROM THE WINDOW)

➤ PAUSE – STOPS THE EXECUTION UNTIL THE USER PRESS ANY KEY

CYCLE



```
Administrator: Command Prompt

C:\Windows\system32>for /?
Runs a specified command for each file in a set of files.

FOR %variable IN (set) DO command [command-parameters]

%variable    Specifies a single letter replaceable parameter.
(set)        Specifies a set of one or more files. Wildcards may be used.
command      Specifies the command to carry out for each file.
command-parameters
              Specifies parameters or switches for the specified command.

To use the FOR command in a batch program, specify %%variable instead
of %variable. Variable names are case sensitive, so %i is different
from %I.
```


EXAMPLE

```
Administrator: Command Prompt

C:\Windows\system32>for %x in (\windows "\program Files") do dir /A %x\*.ini

C:\Windows\system32>dir /A \windows\*.ini
Volume in drive C has no label.
Volume Serial Number is 9E87-56B0

Directory of C:\windows

04/11/2018  04:36 PM                219 system.ini
02/20/2019  01:21 AM                167 win.ini
               2 File(s)              386 bytes
               0 Dir(s)  444,103,852,032 bytes free

C:\Windows\system32>dir /A "\program Files"\*.ini
Volume in drive C has no label.
Volume Serial Number is 9E87-56B0

Directory of C:\program Files

04/11/2018  04:36 PM                174 desktop.ini
               1 File(s)              174 bytes
               0 Dir(s)  444,103,852,032 bytes free

C:\Windows\system32>
```

GOTO

➤ GOTO LABEL - (TO TRANSFER CONTROL TO THE LINE LABELLED BY THE LABEL, ONE OF THE LINES MUST START WITH -> LABEL:)

➤ EXAMPLE OF CODE:

```
GOTO M1
```

```
CD \
```

```
COPY *.TXT \1
```

```
:M1
```

```
ECHO NOTHING HAS BEEN COPIED
```

PARAMETERS IN A BATCH FILE

- WE COULD PASS SOME PIECES OF INFORMATION TO A BATCH FILE BY MEANS OF PARAMETERS
 - ONE COULD DISTINGUISH TWO TYPES OF PARAMETERS:
 - ✓ THOSE IN COMMAND LINE AFTER BATCH FILE NAME – REAL DATA (FILE OR DIRECTORY NAMES, KEYS, AND ETC.);
 - ✓ INTERNAL PARAMETERS' NAMES IN A BATCH FILE (%0, %1, ...%9)
 - ❖ IF YOU WANT TO HAVE MORE PARAMETERS, YOU MUST USE COMMAND “SHIFT”
 - ❖ %0 – THE BATCH FILE NAME
 - ✓ INTERNAL NAMES WILL BE REPLACED BY REAL VALUES FROM THE COMMAND LINE
 - ✓ THERE IS A STRICT CORRESPONDENCE BETWEEN DATA IN THE COMMAND LINE (BATCH FILE CALL) AND INTERNAL NAMES IN THE BATCH FILE
- (I.E. IN THE COMMAND LINE: **A.CMD C:\USERS*.TXT “PROGRAM FILE.EXE”**)
- IN THE BATCH FILE YOU COULD FIND: %0 (A.CMD), %1 (C:\USERS*.TXT), %2 (“PROGRAM FILE.EXE”)

EXAMPLE

TASK: IT IS NECESSARY TO MODEL THE OPERATION OF FILE MOVING FROM ONE DIRECTORY INTO ANOTHER, THE SOURCE FILE NAME AND THE NAME OF DESTINATION DIRECTORY ARE NECESSARY TO PASS AS PARAMETERS

FILE MUST HAVE 2 PARAMETERS:

- SOURCE FILE (TO BE MOVED)
- DESTINATION DIRECTORY (WHERE TO MOVE)

BATCH FILE CONTENT (FIRST PART)

@ECHO OFF

REM FILES MOVING

REM GET TO KNOW IF THE FIRST REAL PARAMETER WAS ENTERED: IF NOT, GO TO THE LINE LABELLED WITH "L1"

IF [%1]==[] GOTO L1

REM GET TO KNOW IF THE SECOND REAL PARAMETER WAS ENTERED: IF NOT, GO TO THE LINE LABELLED WITH "L1"

IF [%2]==[] GOTO L1

REM IF THE FILE TO BE COPIED DOES NOT EXIST, THEN GO TO THE LINE LABELLED WITH "L1"

IF NOT EXIST %1 GOTO L1

REM IF DESTINATION DIRECTORY DOES NOT EXIST, THEN CREATE THIS DIRECTORY

IF NOT EXIST %2 MKDIR %2

REM MAKE A COPY OF THE SOURCE FILE IN THE DESTINATION DIRECTORY

COPY %1 %2

BATCH FILE CONTENT (SECOND PART)

REM WRITE IN THE WINDOW THE WARNING MESSAGE AND INTERRUPT THE OPERATION OF THE BATCH FILE
UNLESS THE USER PRESS ANY KEY

ECHO YOU CAN INTERRUPT OPERATION TYPING CTRL+C OR...

PAUSE > NUL

REM DELETE THE SOURCE FILE

DEL %1

REM NOT TO ENTER UNNECESSARY WARNINGS GO TO THE END LINE LABELLED WITH "L2"

GOTO L2

:L1

ECHO BAD OR LACK OF PARAMETERS

:L2

RESULTS

Input: batch
file name +
parameters

```
C:\> Administrator: Command Prompt - ex01.cmd \1\3.txt
C:\1> ex01.cmd \1\3.txt \5\6\
BAD OR LACK OF PARAMETERS
C:\1> ex01.cmd \1\1.txt \5\6\
1 file(s) copied.
YOU CAN INTERRUPT OPERATION TYPING CTRL+C OR...

C:\1> dir \1
Volume in drive C has no label.
Volume Serial Number is 9E87-56B0

Directory of C:\1

03/17/2019  02:34 AM    <DIR>          .
03/17/2019  02:34 AM    <DIR>          ..
03/17/2019  02:33 AM                261 ex01.cmd
                    1 File(s)                261 bytes
                    2 Dir(s)  444,090,138,624 bytes free

C:\1> dir \5\6
Volume in drive C has no label.
Volume Serial Number is 9E87-56B0

Directory of C:\5\6

03/17/2019  02:33 AM    <DIR>          .
03/17/2019  02:33 AM    <DIR>          ..
03/17/2019  02:31 AM                51 1.txt
                    1 File(s)                51 bytes
                    2 Dir(s)  444,090,396,672 bytes free

C:\1> _
```

Input

```
Select Administrator: Command Prompt - ex01.cmd \1\3.txt
C:\1>ex01.cmd "\1\Line from the poem".txt \5\6\
C:\1>rem @echo off
C:\1>rem FILES MOVING
C:\1>if ["\1\Line from the poem".txt] == [] goto L1
C:\1>if [\5\6\] == [] goto L1
C:\1>if not exist "\1\Line from the poem".txt goto L1
C:\1>if not exist \5\6\ mkdir \5\6\
C:\1>copy "\1\Line from the poem".txt \5\6\
        1 file(s) copied.
C:\1>echo YOU CAN INTERRUPT OPERATION TYPING CTRL+C OR...
YOU CAN INTERRUPT OPERATION TYPING CTRL+C OR...
C:\1>pause 1>NUL
C:\1>del "\1\Line from the poem".txt
C:\1>goto L2
C:\1>
```


VARIABLES

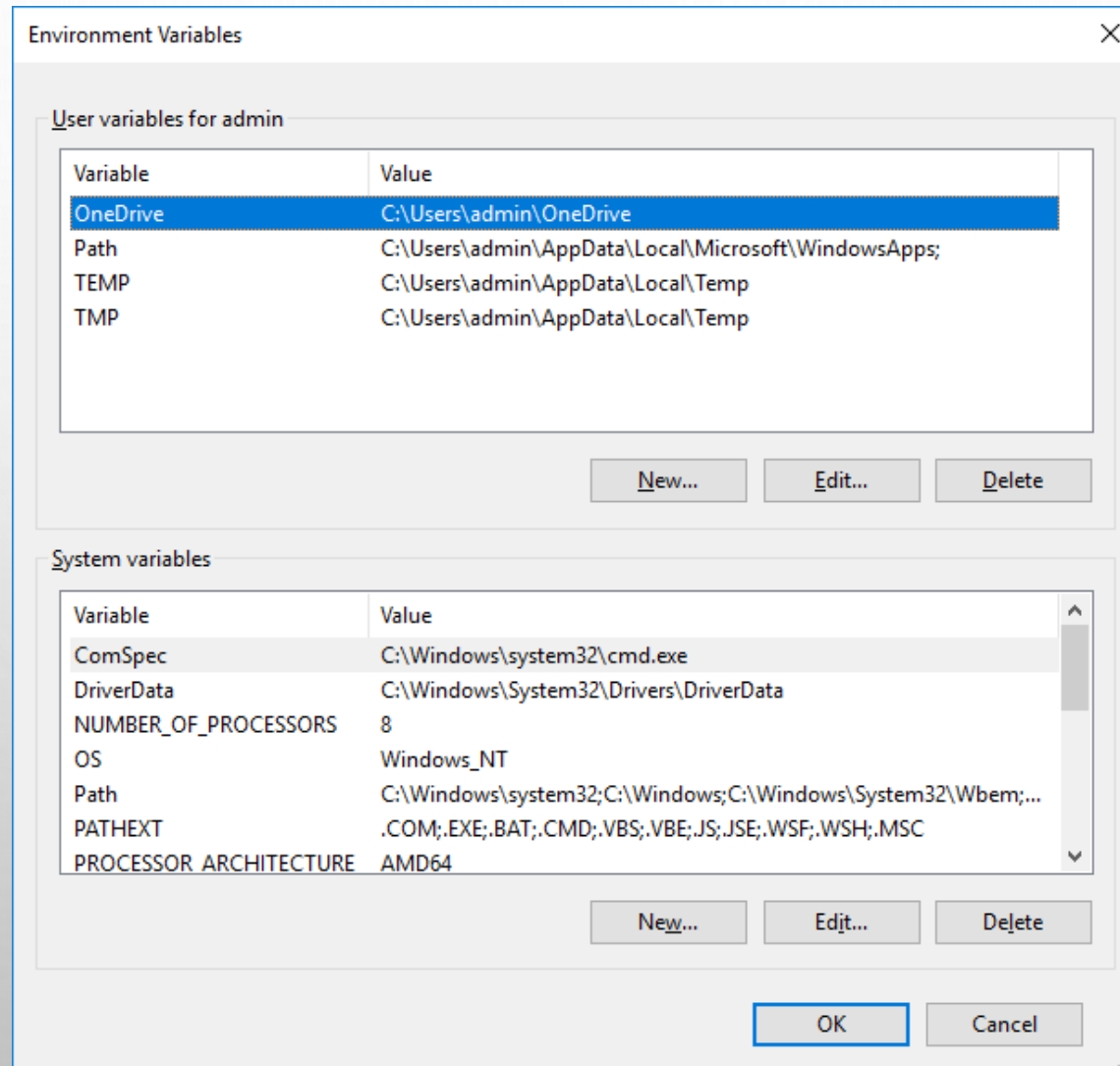


```
graph TD; A[VARIABLES] --> B[SYSTEM VARIABLES<br/>(FOR EVERY USER)]; A --> C[USER VARIABLES<br/>(FOR THE USER WHO CREATED IT)]
```

SYSTEM
VARIABLES
(FOR EVERY USER)

USER VARIABLES
(FOR THE USER
WHO CREATED IT)

SYSTEM\ADVANCED SYSTEM SETTINGS\ENVIRONMENT VARIABLES



COMMAND “SET”

Zvereva O. (OS - Lecture 5)

```
C:\>SET
ALLUSERSPROFILE=C:\ProgramData
APPDATA=C:\Users\admin\AppData\Roaming
CommonProgramFiles=C:\Program Files\Common Files
CommonProgramFiles(x86)=C:\Program Files (x86)\Common Files
CommonProgramW6432=C:\Program Files\Common Files
COMPUTERNAME=DESKTOP-IV1039D
ComSpec=C:\Windows\system32\cmd.exe
DriverData=C:\Windows\System32\Drivers\DriverData
HOMEDRIVE=C:
HOMEPATH=\Users\admin
LOCALAPPDATA=C:\Users\admin\AppData\Local
LOGONSERVER=\\DESKTOP-IV1039D
NUMBER_OF_PROCESSORS=8
OneDrive=C:\Users\admin\OneDrive
OS=Windows_NT
Path=C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Windows\System32\OpenSSH\;C:\Program Files\Microsoft VS Code\bin;C:\Users\admin\AppData\Local\Microsoft\WindowsApps
PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE=AMD64
PROCESSOR_IDENTIFIER=Intel64 Family 6 Model 142 Stepping 10, GenuineIntel
PROCESSOR_LEVEL=6
PROCESSOR_REVISION=8e0a
ProgramData=C:\ProgramData
ProgramFiles=C:\Program Files
ProgramFiles(x86)=C:\Program Files (x86)
ProgramW6432=C:\Program Files
PROMPT=$P$G
PSModulePath=C:\Program Files\WindowsPowerShell\Modules;C:\Windows\system32\WindowsPowerShell\v1.0\Modules
PUBLIC=C:\Users\Public
SystemDrive=C:
SystemRoot=C:\Windows
TEMP=C:\Users\admin\AppData\Local\Temp
TMP=C:\Users\admin\AppData\Local\Temp
USERDOMAIN=DESKTOP-IV1039D
USERDOMAIN_ROAMINGPROFILE=DESKTOP-IV1039D
USERNAME=admin
USERPROFILE=C:\Users\admin
windir=C:\Windows
```

ENVIRONMENT VARIABLE SET

VARIABLE CREATION:

- GUI (WINDOW SHOWN IN THE 39 SLIDE)
- COMMAND “SET” (SET VARIABLE_NAME=VARIABLE_VALUE)

VARIABLE USAGE:

%VARIABLE_NAME%

EXAMPLE

The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt - ex01.cmd \\1\3.txt". The user has entered the command `set ex_val=\\` and then `dir %ex_val%`. The output shows the directory listing for C:\, including files like 1, 2, 5, Intel, PerfLogs, Program Files, Program Files (x86), Users, and Windows, along with file counts and free space.

```
Administrator: Command Prompt - ex01.cmd \\1\3.txt

C:\>set ex_val=\\

C:\>dir %ex_val%
Volume in drive C has no label.
Volume Serial Number is 9E87-56B0

Directory of C:\

03/17/2019  02:38 AM    <DIR>          1
03/17/2019  02:18 AM    <DIR>          2
03/17/2019  02:33 AM    <DIR>          5
02/20/2019  12:51 AM    <DIR>        Intel
04/11/2018  04:38 PM    <DIR>        PerfLogs
03/03/2019  01:06 AM    <DIR>        Program Files
02/20/2019  01:33 AM    <DIR>        Program Files (x86)
02/20/2019  01:28 AM    <DIR>        Users
02/20/2019  04:12 AM    <DIR>        Windows
               0 File(s)                0 bytes
               9 Dir(s)  444,083,761,152 bytes free

C:\>_
```

SOME ENVIRONMENT SYSTEM VARIABLES

VARIABLE NAME	DESCRIPTION
SYSTEMDRIVE	NAME OF THE DRIVE WITH THE SYSTEM DIRECTORY
SYSTEMROOT	PATH TO THE DIRECTORY WHERE SYSTEM FILES ARE STORED
COMPUTERNAME	NAME OF THE COMPUTER YOU ARE WORKING AT THE MOMENT
USERNAME	USER LOGIN YOU ARE USING AT THE MOMENT
OS	OPERATING SYSTEM
PATH	SEQUENCE OF THE PATHES WHER OS ARE LOOKING FOR FILES

HOME TASK

(CODING BATCH FILES CARRYING OUT THE FOLLOWING ACTIONS)

- ARCHIVE THE DATA STORED IN VARIOUS DIRECTORIES (INDICATED AS THE BATCH FILE PARAMETERS) INTO THE SPECIFIED DIRECTORY WITH THE PRELIMINARY CHECK THAT THIS DIRECTORY EXISTS, IF NOT – CREATE THIS DIRECTORY
- LOOK FOR A FILE WITH THE INDICATED AS A PARAMETER NAME IN THE DIRECTORY WHICH NAME IS DEFINED BY THE ENVIRONMENT VARIABLE “TEMP”. IF FILE WITH THE SPECIFIED NAME EXISTS, COMPARE ITS CONTENT WITH THE CONTENT OF FILE WITH THE SAME NAME IN THE HOME DIRECTORY OF THE CURRENT USER (PATH TO THIS DIRECTORY IS STORED IN THE “HOMEDIR” VARIABLE)
- RECEIVE THE CONTENT OF THE ROOT DIRECTORIES FROM ALL EXISTING LOGICAL DISKS OF THE COMPUTER, AND WRITE IT INTO THE FILE, WHICH NAME IS THE SAME AS THE NAME OF THE COMPUTER