

# Command Line Interfaces

CSC02A2



## Outline



## 1 Command Line Interfaces

What is a Command Line Interface?

The format of a CLI instruction

## 2 Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

## 3 Batch Files

Storing commands in Batch files

Variables in Batch Files

### Command Line Interfaces

What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# Command Line Interfaces

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# What is a Command Line Interface?

**Command line interfaces / interpreters** (CLI), also known as **terminals**, represent a way to control computer systems through a text based interface.

Although these days most user software is controlled through visual metaphors such as the desktop, mouse pointers and gesture recognition.

CLIs are still widely used by advanced users and system administrators.

## Outline

### Command Line Interfaces

#### What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# The format of a CLI instruction

PROMPT COMMAND PARAMETER-LIST where

| Entry                 | Explanation  |
|-----------------------|--|
| <b>PROMPT</b>         | A signal to the user that the system is waiting to accept command, it usually contains additional information such as the current directory. |
| <b>COMMAND</b>        | The action the user wishes to undertake. May be realised by the CLI, the OS or an executable program.  |
| <b>PARAMETER-LIST</b> | Additional data regarding the behaviour of the command e.g. options, input sources, output destinations etc.                                 |

## Outline

### Command Line Interfaces

What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



## Basic Commands

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# Basic Commands

CLIs differ based on operating system conventions, command name and usage, syntax, fundamental data representations (objects versus streams) etc. However, there are still a large number of common functions:

- Navigation
  - Find the current location in the file system
  - Change location (relatively / absolutely)
- File and Directory Management
  - Create, Delete, Copy, Execute files / directories
  - Manage file / directory properties
  - Display file / directory contents
- Wild-card expansion and command chaining
- Store command sequences for later execution

## Outline

### Command Line Interfaces

What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

#### Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files





Often called the DOS<sup>1</sup> Prompt, cmd.exe remains a much used part of the advanced user's tool box.

```
Microsoft Windows [Version 10.0.19044.1526]
(c) Microsoft Corporation. All rights reserved.

C:\CSC2A>
```

DOS Prompt can be started in one of the following ways:

- From the start menu, by searching for **cmd**
- From the file explorer, by typing **cmd** into the address bar
- From the context menu<sup>2</sup> in file explorer of a directory

## Auto-completion

Use the **TAB** key to let windows attempt to auto-complete the name of the file or directory you are filling in.

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<sup>1</sup>Disk Operating System, Windows' predecessor

<sup>2</sup>Right-click menu

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What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

Basic Commands

#### CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# Navigation Commands I

Show current directory

```
C:\CSC2A\workspace> echo %cd%  
C:\CSC2A\workspace
```

Change to another drive

```
C:\CSC2A\workspace> T:  
T:>
```

Change to absolute directory path

```
T:> cd C:\CSC2A  
C:\CSC2A>
```

Change to sub directory

```
C:\CSC2A> cd C:\CSC2A\workspace  
C:\CSC2A\workspace>
```

Change to parent directory

```
C:\CSC2A\workspace> cd ..  
C:\CSC2A>
```

## Outline

### Command Line Interfaces

What is a Command Line Interface?

The format of a CLI instruction

### Basic Commands

Basic Commands

CMD.EXE

### Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# Navigation Commands II

## Long File Names

To handle file names with spaces use quotation marks to escape the long file name.

```
C:\CSC2A> cd "C:\Path With Spaces"  
C:\Path With Spaces>
```

## Special Directories and Symbols

- - Refers to the current directory
- • - Refers to the parent / containing directory
- \* - The asterisk character \* is a wild card character and can match any sequence of characters

## Getting help with parameters

Most commands can be followed with a **/?** in order to find out more about them.

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Basic Commands

CMD.EXE

### Navigation Commands

File and Directory Management

Redirection

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Storing commands in Batch files

Variables in Batch Files



# File and Directory Management

| Action                             | Command                            |
|------------------------------------|------------------------------------|
| Directory Listing                  | <b>dir</b>                         |
| File Listing                       | <b>type TextFileName</b>           |
| Create a directory (relative path) | <b>mkdir DirectoryName</b>         |
| Create a directory (absolute path) | <b>mkdir DRIVE:FULL-PATH</b>       |
| Delete a file                      | <b>del FileName</b>                |
| Delete empty directory             | <b>rmdir DirectoryName</b>         |
| Delete directory tree              | <b>del /s /q DirectoryName</b>     |
| Move file or directory             | <b>move SourceName Destination</b> |
| Copy file or directory             | <b>copy SourceName Destination</b> |
| Rename file or directory           | <b>rename OldName NewName</b>      |

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Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# Redirection

It is possible to redirect the output from one command to other places such as files and other programs. It is possible to redirect all standard streams (input, output and error). However, the examples below just show standard input and standard output redirection.

Redirect command output to a file  
(Overwrite)

```
C:\CSC2A\workspace> command > filename
```

Redirect command output to a file  
(Append)

```
C:\CSC2A\workspace> command >> filename
```

Redirect the content of the file as  
input to command

```
C:\CSC2A\workspace> command < filename
```

## Outline

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### Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

### Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



## Batch Files

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# Storing commands in Batch files

It is possible to store commands in a text file with the **.BAT** extension for later reuse. In fact these **.BAT** files can be made into fully fledged programs but that is beyond the scope of this lecture.

Some useful commands:

| Action  | Command   |
|---|-----------|
| Turn off command appearing in output                | @         |
| Stop commands appearing in batch file               | @ECHO OFF |
| Wait until the user presses a key before continuing | PAUSE     |
| Clear screen contents                               | CLS       |

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Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files



# Variables in Batch Files

Batch files can contain variables with certain restrictions. A variable can be initialised with the **SET** command:

Example **set VAR="HI!"**

## Important

Note that there is no space between the equal sign and the value being set. Spaces are treated as part of the command

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### Basic Commands

Basic Commands

CMD.EXE

Navigation Commands

File and Directory Management

Redirection

### Batch Files

Storing commands in Batch files

Variables in Batch Files

