

# Notes 8

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## Command: `awk`

### Definition

`awk` is a powerful text-processing tool used for pattern scanning and processing. It processes input line by line and allows operations based on fields.

### Usage / Formula

```
awk 'pattern { action }' filename
```

### Examples

```
awk '{print $1}' file.txt           # Prints the first field of each line
awk -F":" '{print $1, $6}' /etc/passwd # Uses colon as field separator,
prints username and home dir
awk '/error/ {print $0}' log.txt     # Prints lines that contain the word
"error"
```

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## Command: `sed`

### Definition

`sed` is a stream editor that can perform basic text transformations on an input stream (a file or input from a pipeline).

### Usage / Formula

```
sed 's/pattern/replacement/' filename
```

### Examples

```
sed 's/apple/orange/' fruits.txt      # Replaces first occurrence of
'apple' with 'orange' per line
sed 's/[0-9]*/[number]/g' file.txt    # Replaces all numbers with
[number]
sed -n '/error/p' log.txt              # Prints only lines that contain
the word "error"
```

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## Command: `less`

### Definition

`less` is a pager program used to view (but not change) the contents of a text file one screen at a time.

### Usage / Formula

```
less filename
```

### Examples

```
less /etc/passwd           # View system users file
less largefile.txt         # Open a large file with navigation
cat file.txt | less        # Pipe output into less for scrolling
```

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## Redirection and Pipe Symbols

### > — Redirect Output (Overwrite)

#### Definition

Redirects standard output to a file, **overwriting** its contents.

#### Usage

```
command > file
```

### Examples

```
echo "Hello" > output.txt      # Writes 'Hello' to output.txt
ls > filelist.txt              # Saves directory listing
date > timestamp.txt           # Writes current date to a file
```

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### >> — Redirect Output (Append)

#### Definition

Redirects standard output to a file, **appending** the output.

## Usage

```
command >> file
```

## Examples

```
echo "Log line" >> log.txt      # Adds a line to the end of log.txt
whoami >> users.log             # Appends current username
df -h >> disk_report.txt        # Appends disk usage report
```

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## | — Pipe

### Definition

Sends the **output** of one command as **input** to another command.

### Usage

```
command1 | command2
```

## Examples

```
ls -l | less                    # View long list in scrollable format
ps aux | grep nginx             # Find nginx processes
cat file.txt | wc -l            # Count lines in a file
```