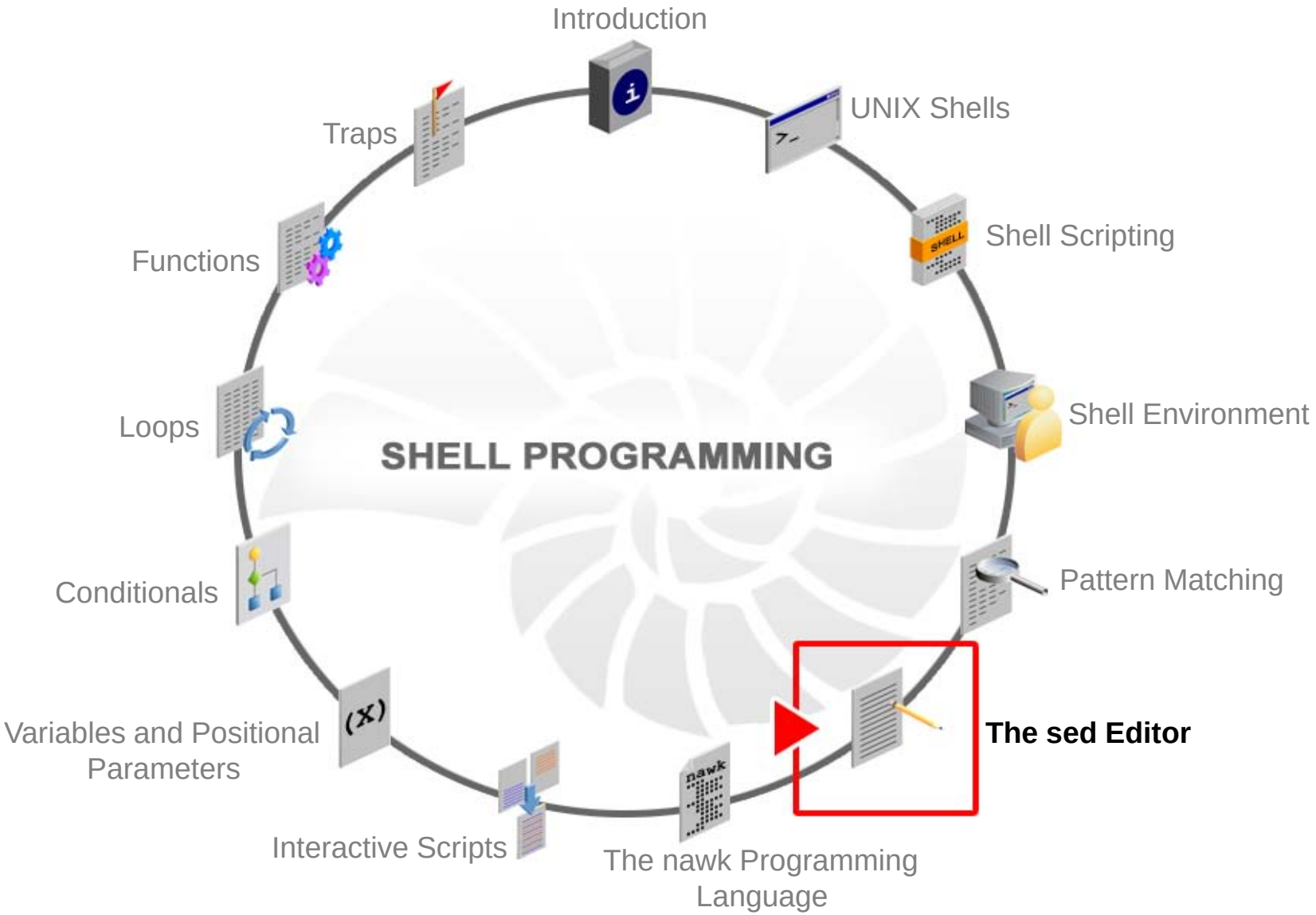
6

The sed Editor



Objectives

After completing this lesson, you should be able to:

- Describe the sed editor
- Perform noninteractive editing tasks by using the sed editor

Agenda

- Describing the sed editor
- Performing noninteractive editing tasks by using the sed editor

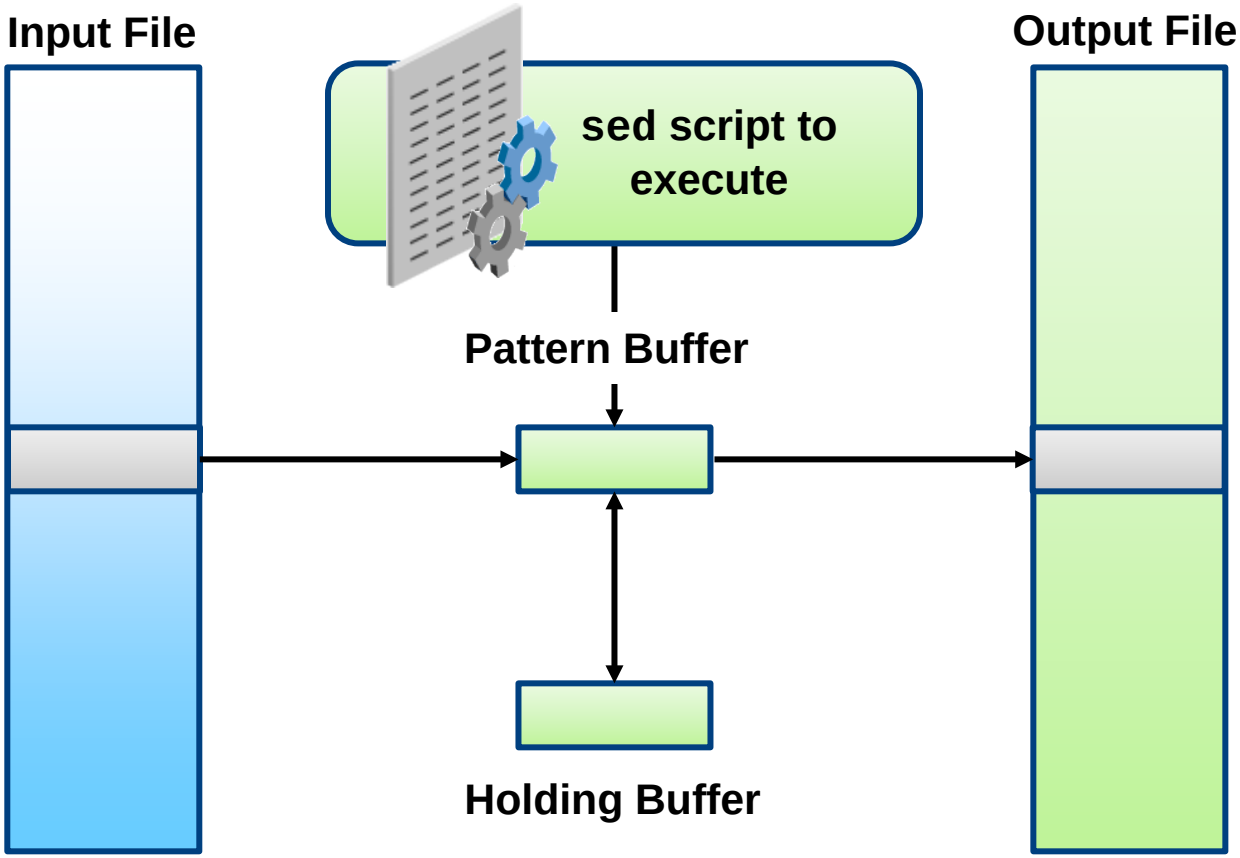
Introduction to the sed Editor

- The term sed stands for stream editor, which:
  - Is nondestructive
  - Is noninteractive
  - Uses regular expressions
- Syntax:

```
sed [options] '[addresses] action [args]' files [ > outfile]
```

Note: The sed syntax allows for an input file to be specified on the command line, whereas the output file specification can be accomplished through output redirection.

How sed Works



Editing Commands

- The sed commands:

Command	Function
d	Deletes a line or lines
p	Prints a line or lines
r	Reads a file
s	Substitutes one string for another
w	Writes to a file

- The sed options:

Option	Function
-n	Suppresses the default output
-f	Reads sed commands from a script file

Addressing

- The sed editor processes all lines of the input file unless you specify an address.
- The address can be in any of the following forms:
  - A single line number
  - A range of line numbers
  - A regular expression
    - $ for last line of file
    - / (forward slash) to delimit a regular expression
  - A combination of range and regular expression

Agenda

- Describing the sed editor
- Performing noninteractive editing tasks by using the sed editor

Performing Noninteractive Tasks

You can use sed to perform noniterative tasks, such as:

- Printing text
- Substituting text
- Reading from a file of new text
- Deleting text
- Reading sed commands from a file
- Writing output files

Printing Text

The p command in sed prints lines.

```
$ sed '3,5p' data.file
northwest   NW     Joel Craig     3.0 .98 3      4
western     WE     Sharon Kelly   5.3 .97 5      23
southwest   SW     Chris Foster   2.7 .8 2       18
southwest   SW     Chris Foster   2.7 .8 2       18
southern    SO     May Chin       5.1 .95 4      15
southern    SO     May Chin       5.1 .95 4      15
southeast   SE     Derek Johnson  5.0 .70 4      17
southeast   SE     Derek Johnson  5.0 .70 4      17
eastern     EA     Susan Beal     4.4 .8 5       20
northeast   NE     TJ Nichols     5.1 .94 3      13
north       NO     Val Shultz     4.5 .89 5      9
central     CT     Sheri Watson   5.7 .94 5      13
```

Printing Text

```
$ sed -n '3,5p' data.file
southwest   SW      Chris Foster   2.7 .8          2       18
southern    SO      May Chin       5.1 .95         4       15
southeast   SE      Derek Johnson  5.0 .70         4       17

$ sed -n '/west/p' data.file
northwest   NW      Joel Craig     3.0 .98         3       4
western     WE      Sharon Kelly   5.3 .97         5       23
southwest   SW      Chris Foster   2.7 .8          2       18

$ sed -n '/west/,/southern/p' data.file
northwest   NW      Joel Craig     3.0 .98         3       4
western     WE      Sharon Kelly   5.3 .97         5       23
southwest   SW      Chris Foster   2.7 .8          2       18
southern    SO      May Chin       5.1 .95         4       15
```

Printing Text

```
$ sed -n '/Chris/,$p' data.file
southwest   SW      Chris Foster   2.7 .8          2       18
southern    SO      May Chin       5.1 .95         4       15
southeast   SE      Derek Johnson  5.0 .70         4       17
eastern     EA      Susan Beal     4.4 .8          5       20
northeast   NE      TJ Nichols     5.1 .94         3       13
north       NO      Val Shultz     4.5 .89         5       9
central     CT      Sheri Watson   5.7 .94         5       13

$ sed -n '/^s.*5$/p' data.file
southern    SO      May Chin       5.1 .95         4       15
```

Substituting Text

- The `s` command in `sed` performs search and substitution operations on the text.

```
$ sed 's/oldstring/newstring/' file
```

- The substitution operations can:
  - Substitute a new string for an old string
  - Perform global substitution by using `g`
  - Include the `oldstring` in the `newstring` by using `&`

Substituting Text

```
$ sed 's/3/X/' data.file
northwest   NW     Joel Craig     X.0 .98        3       4
western     WE     Sharon Kelly   5.X .97        5       23
southwest   SW     Chris Foster   2.7 .8 2       18
southern    SO     May Chin       5.1 .95        4       15
southeast   SE     Derek Johnson  5.0 .70        4       17
eastern     EA     Susan Beal     4.4 .8 5       20
northeast   NE     TJ Nichols     5.1 .94        X       13
north       NO     Val Shultz     4.5 .89        5       9
central     CT     Sheri Watson   5.7 .94        5       1X
$ sed 's/3/X/g' data.file
northwest   NW     Joel Craig     X.0 .98        X       4
western     WE     Sharon Kelly   5.X .97        5       2X
southwest   SW     Chris Foster   2.7 .8 2       18
southern    SO     May Chin       5.1 .95        4       15
southeast   SE     Derek Johnson  5.0 .70        4       17
eastern     EA     Susan Beal     4.4 .8 5       20
northeast   NE     TJ Nichols     5.1 .94        X       1X
north       NO     Val Shultz     4.5 .89        5       9
central     CT     Sheri Watson   5.7 .94        5       1X
```

Substituting Text

```
$ sed -n '/ [0-9]$/p' data.file
northwest     NW      Joel Craig       3.0 .98  3        4
north         NO      Val Shultz       4.5 .89  5        9

$ sed 's/ [0-9]$/& Single Digit/' data.file
Northwest     NW      Joel Craig       3.0 .98  3 4 Single Digit
western       WE      Sharon Kelly     5.3 .97  5 23
southwest     SW      Chris Foster     2.7 .8   2 18
southern      SO      May Chin         5.1 .95  4 15
southeast     SE      Derek Johnson    5.0 .70  4 17
eastern       EA      Susan Beal       4.4 .8   5 20
northeast     NE      TJ Nichols       5.1 .94  3 13
north         NO      Val Shultz       4.5 .89  5 9 Single Digit
central       CT      Sheri Watson     5.7 .94  5 13
```

Reading from a File for New Text

- Instead of inserting a line of text once, you might want to repeat the procedure several times, either in the same file or across multiple files.
- The `r` (read) command specifies a file name, and the contents of the file are inserted into the output after the lines specified by the address.
- The address may be a line number or pattern combination.

Reading from a File for New Text

```
$ cat northmesg
*** The northern regions are the newest in the company ***
*** and the people are still being trained. **************

$ sed '/north/r northmesg' data.file
northwest   NW     Joel Craig     3.0 .98        3 4
*** The northern regions are the newest in the company ***
*** and the people are still being trained. **************
western     WE     Sharon Kelly   5.3 .97        5 23
southwest   SW     Chris Foster   2.7 .8         2 18
southern    SO     May Chin       5.1 .95        4 15
southeast   SE     Derek Johnson  5.0 .70        4 17
eastern     EA     Susan Beal     4.4 .8         5 20
northeast   NE     TJ Nichols     5.1 .94        3 13
*** The northern regions are the newest in the company ***
*** and the people are still being trained. **************
north       NO     Val Shultz     4.5 .89        5 9
*** The northern regions are the newest in the company ***
*** and the people are still being trained. **************
central     CT     Sheri Watson   5.7 .94        5 13
```

Deleting Text

- The d (delete) command is used to:
  - Delete lines containing the search expression
  - Delete lines in the address range
- When used with !, it means do not delete those lines.

Deleting Text

```
$ sed '4,8d' data.file
northwest   NW      Joel Craig     3.0 .98        3       4
western     WE      Sharon Kelly   5.3 .97        5       23
southwest   SW      Chris Foster   2.7 .8         2       18
central     CT      Sheri Watson   5.7 .94        5       13

$ sed '/west/d' data.file
southern    SO      May Chin       5.1 .95        4       15
southeast   SE      Derek Johnson  5.0 .70        4       17
eastern     EA      Susan Beal     4.4 .8         5       20
northeast   NE      TJ Nichols     5.1 .94        3       13
north       NO      Val Shultz     4.5 .89        5       9
central     CT      Sheri Watson   5.7 .94        5       13
```

Deleting Text

```
$ sed '/^west/d' data.file
northwest   NW     Joel Craig     3.0 .98        3       4
southwest   SW     Chris Foster   2.7 .8         2       18
southern    SO     May Chin       5.1 .95        4       15
southeast   SE     Derek Johnson  5.0 .70        4       17
eastern     EA     Susan Beal     4.4 .8         5       20
northeast   NE     TJ Nichols     5.1 .94        3       13
north       NO     Val Shultz     4.5 .89        5       9
central     CT     Sheri Watson   5.7 .94        5       13

$ sed '/south/,/north/d' data.file
northwest   NW     Joel Craig     3.0 .98        3       4
western     WE     Sharon Kelly   5.3 .97        5       23
north       NO     Val Shultz     4.5 .89        5       9
central     CT     Sheri Watson   5.7 .94        5       13
```

Reading sed Commands from a File

- Multiple `sed` commands can be put in a file and executed by using the `-f` option.
- When placing commands in a file:
  - Do not use quotation marks around the action and address
  - Ensure that there is no trailing white space at the end of each line

```
$ cat script1.sed
1,4d
s/north/North/
s/^east/East/

$ sed -f script1.sed data.file
southeast   SE      Derek Johnson   5.0 .70         4       17
Eastern     EA      Susan Beal      4.4 .8          5       20
Northeast   NE      TJ Nichols      5.1 .94         3       13
North       NO      Val Shultz      4.5 .89         5       9
central     CT      Sheri Watson    5.7 .94         5       13
```

Writing Output Files

- The `w` (write) command writes the specified records to a named file.
- The `w` command is followed by the path name of the file.

Using sed to Write Output Files

```
$ cat script5.sed
/north/w northregions
s/9[0-9]/& Great job!/w topperformers
$ sed -n -f script5.sed data.file
$ more northregions topperformers
::::::::::::::
northregions
::::::::::::::
northwest       NW      Joel Craig      3.0 .98         3       4
northeast       NE      TJ Nichols      5.1 .94         3       13
north           NO      Val Shultz      4.5 .89         5       9
::::::::::::::
topperformers
::::::::::::::
northwest       NW      Joel Craig      3.0 .98 Great job! 3    4
western         WE      Sharon Kelly    5.3 .97 Great job! 5    23
southern        SO      May Chin        5.1 .95 Great job! 4    15
northeast       NE      TJ Nichols      5.1 .94 Great job! 3    13
central         CT      Sheri Watson    5.7 .94 Great job! 5    13
```

Quiz

Which element's location in the s command determines the location of the old string in the replacement string?

a. /

b. $

c. !

d. &

Summary

In this lesson, you should have learned how to:

- Describe the sed editor
- Perform noninteractive editing tasks by using the sed editor

Practice 6 Overview: The sed Editor

This practice covers the following topics:

- Using the sed Editor
  - You delete, write, search, and substitute text patterns using regular expressions.
  - You print lines from the input file to the standard output or to a specified file.