Appendix

Regular Expressions

Overview

- What are regular expressions
- Regular Expression Metacharacters
- Utilizing regular expressions

Lesson: What are Regular Expressions

- Regular expressions are used to search for text patterns.
- Expressions can contain:
  - Literal text `abcde`
  - Metacharacters `^.*$`
  - Combinations of the two `^.ab.c*de$`
- Regular expressions are used by many UNIX commands:
  - `more vi grep sed awk expr`

Lesson: Regular Expression Metacharacters

- Regular expressions use some of the same metacharacters as the shell's pattern matching.

  . * + ? $ ^ [ ] ( ) { } |

- To avoid incorrect interpretation, always enclose the regular expression in single quotes:
  - *command* '*pattern*' [*filename*]
- Single quotes prevent the shell from interpreting the regular expressions.

Lesson: Utilizing regular expressions

^ match line beginning

```
$ grep '^stu' /etc/passwd
stu01:x:301:300:Student 1:/home/stu01:/bin/sh
...
stu09:x:309:300:Student 9:/home/stu09:/bin/sh
```

$ match line end

```
$ grep '/bin/bash$' /etc/passwd
root:x:0:0::/root:/bin/bash
daemon:x:1:0::/:/bin/bash
bin:x:3:0::/bin:/bin/bash
...
```

Utilizing regular expressions (continued)

[] Defines a class of characters

- \- defines an inclusive range
- ^ negates the defined class

```
$ grep '[Dd]isk' fortunes
Disc crisis, please clean up!
I must have slipped a disk; my pack hurts.
...

$ grep '^stu0[^2-6]' /etc/passwd
stu01:x:301:300:Student 1:/home/stu01:/bin/sh
stu07:x:307:300:Student 7:/home/stu07:/bin/sh
stu08:x:308:300:Student 8:/home/stu08:/bin/sh
stu09:x:309:300:Student 9:/home/stu09:/bin/sh
```

Utilizing regular expressions (continued)

. match any single character

```
$ grep ' [Uu]... ' fortunes
* UNIX is a trademark of Bell Laboratories.
Love the sea? I dote upon it - from the beach.
```

| defines alternate patterns

```
$ grep 'stu01|stu05' /etc/passwd
stu01:x:301:300:Student 1:/home/stu01:/bin/sh
stu05:x:305:300:Student 5:/home/stu05:/bin/sh
```

() used for grouping

```
$ grep 'stu(01|02|03)' /etc/passwd
stu01:x:301:300:Student 1:/home/stu01:/bin/sh
stu02:x:302:300:Student 2:/home/stu02:/bin/sh
stu03:x:303:300:Student 3:/home/stu03:/bin/sh
```

Regular expressions – closures

* or {0,} Repeat previous pattern 0 or more times

```
$ grep ' [Vv][a-z]* ' fortunes
He who hates vices hates mankind.
Words are the voice of the heart.
```

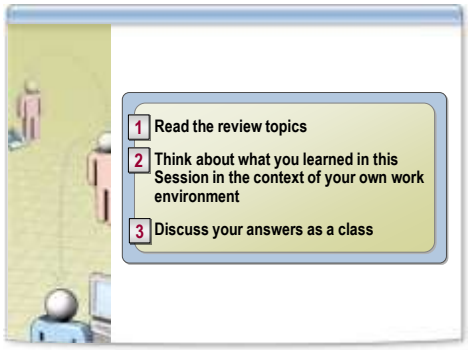
+ or {1,} Repeat previous pattern 1 or more times

```
$ grep ' [FZ][d-w]+ ' fortunes
As Zeus said to Narcissus: "Watch Yourself."
Time flies like an arrow. Fruit flies like a banana.
```

? or {0,1} Repeat previous pattern 0 or 1 times

```
$ grep ' [BT][a-z]? ' fortunes
LISP: To call a spade a thpade.
Love is in the offing. Be affectionate to one who...
```

Review Exercises

- Complete the exercises from the Learning Guide

Topics for Review