

ULI101: INTRODUCTION TO UNIX / LINUX AND THE INTERNET

WEEK 8: LESSON 2

EXTENDED REGULAR EXPRESSIONS

LINUX COMMANDS THAT USE REGULAR EXPRESSIONS

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LESSON 2 TOPICS

Extended Regular Expressions

- Definition / Purpose
- Extended Regular Expressions Symbols
- Instructor Demonstration

Other Linux Commands That Use Regular Expressions

- `man` , `more` , `less` , `vi` , `sed` , `awk`

Perform Week 9 Tutorial

- Investigation 2
- Review Questions (**Extended Regular Expressions**, Parts **A** and **B**)

Complete Assignment #2 (Due Friday at midnight)

Work on Assignment #3 (Section I: Regular Expressions Using grep)

EXTENDED REGULAR EXPRESSIONS

Extended Regular Expressions

Extended Regular Expressions consist of additional special characters that “**extend**” the capability of regular expressions.



We will discuss three types of **extended regular expressions**:

Repetition: {*min*, *max*} , ? , +

Grouping: ()

Or Condition: |

EXTENDED REGULAR EXPRESSIONS

AAAA

Repetition

The extended regular expression symbol consists of the **minimum** and/or **maximum** number of repetitions contained within braces { }

Usage:

`{min,max}`

Examples:

<code>a{2,5}</code>	2 to 5 occurrences of the character a
<code>[0-9]{1,}</code> <code>[0-9]+</code>	1 or more occurrences of a number (shortcut method)
<code>[a-z]{0,1}</code> <code>[a-z]?</code>	zero or 1 occurrence of a lowercase letter (shortcut method)

EXTENDED REGULAR EXPRESSIONS

AAAA

Repetition Extended Regular Expression Example

If you issue the **grep** command without options with **extended** regular expressions, the command **will NOT work**.

When using the grep command with extended regular expressions you need to use *egrep* or *grep -E*

Examples:

```
egrep "^[0-9]{1,}$" data.txt
egrep "^[+-]{0,1}[0-9]{1,}$" data.txt
egrep "^[0-9]{1,}[.]{0,1}[0-9]{0,}$" data.txt

grep -E "^[0-9]{1,}$" data.txt
grep -E "^[+-]{0,1}[0-9]{1,}$" data.txt
grep -E "^[0-9]{1,}[.]{0,1}[0-9]{0,}$" data.txt
```

```
cat data.txt
123
+45
+++37
-67.89
--57.6
-78...4
12.6
+26.887

egrep "^[0-9]{1,}$" data.txt
123

egrep "^[+-]{0,1}[0-9]{1,}$" data.txt
123
+45

egrep "^[0-9]{1,}[.]{0,1}[0-9]{0,}$" data.txt
123
12.6
```

EXTENDED REGULAR EXPRESSIONS

(pattern)

Grouping

If you want to search for repetition for a **group** of **characters**, a **word**, or a **phase**, you can enclose them within brackets ()

Examples:

```
egrep "(the ){2,}" data.txt
```

```
egrep "(lazy fox ){2,3}" data.txt
```

```
cat data.txt
The lazy fox jumped over dog
Time to go to the the store
I like to go to the movies
I act like a lazy fox lazy fox lazy fox
Don't be a lazy fox

egrep "(the ){2,}" data.txt
Time to go to the the store

egrep "(lazy fox ){2,3}" data.txt
I act like a lazy fox lazy fox lazy fox
```

REGULAR EXPRESSIONS

(this |that)

Or Condition

The **|** symbol is used as the “or” symbol to provide **alternatives** within a **group**.

Examples:

```
egrep "(this | that ){1,}" data.txt
```

```
egrep "(a|b|c){3,}" data.txt
```

```
cat data.txt
I know this is the day
Because that is correct
We don't know that it is sunny
I know how to cccamp
I waaaaant a tissue
Can a bbborrow a cup of sugar?

egrep "(this | that ){1,}" data.txt
I know this is the day
Because that is correct
We don't know that it is sunny

egrep "(a|b|c){3,}" data.txt
I know how to cccamp
I waaaaant a tissue
Can a bbborrow a cup of sugar?
```


REGULAR EXPRESSIONS

Instructor Demonstration

Your instructor will demonstrate examples of using **Extended Regular expressions** with the **egrep** command.



REGULAR EXPRESSIONS



Other Linux Commands that Use Extended Regular Expressions

There are other Linux commands / utilities in addition to *grep* or *egrep* that use regular expressions.

You have already used a few of these commands like: *man*, *more*, *less*, and *vi*.

Other commands like *sed* and *awk* will be taught in a future lesson.

REGULAR EXPRESSIONS

Other Linux Commands that Use Extended Regular Expressions



`man` , `more` , `less`

When searching for patterns using the `man`, `more`, or `less` commands, you specify a regular expression with a **forward slash /**

Example with **`man ls`** command:

`/classify`

```
-F, --classify
    append indicator (one of */=>@|) to entries

--file-type
    likewise, except do not append '*'

--format=WORD
    across -x, commas -m, horizontal -x, long -l,

--full-time
    like -l --time-style=full-iso
```

REGULAR EXPRESSIONS

Other Linux Commands that Use Extended Regular Expressions



vi

The **vi** text editor use regular expressions to search and manipulate (edit) text within a text document.

Examples:

/pattern – search for pattern in text file
:%s/uli101/ULI101/g – search and replace text globally (all lines)

```
I am taking the course ULI101
There are a lot of commands taught in ULI101
I am over half way in the ULI101 course
I like Linux
```

```
~
~
~
~
~
```

REGULAR EXPRESSIONS



Using Regular Expressions with Linux Commands other than grep

`awk` , `sed`

The **awk** and **sed** Linux utilities are used to **manipulate** text, from files or via Linux pipeline commands.

You will learn how to use these commands in a **later** lesson.

REGULAR EXPRESSIONS

Instructor Demonstration

Your instructor will demonstrate examples of using **Extended Regular Expressions** with the **man**, **more**, **less** and **vi** utilities.



REGULAR EXPRESSIONS

Getting Practice

To get practice to help perform **assignment #3**, perform **Week 8 Tutorial**:

- [INVESTIGATION 2: EXTENDED REGULAR EXPRESSIONS](#)
- [INVESTIGATION 3: OTHER COMMANDS THAT USE REGULAR EXPRESSIONS](#)
- [LINUX PRACTICE QUESTIONS](#)

(Extended Regular Expressions, Parts **A** and **B**)

Complete Assignment #2 (Due Week 9)

Work on Assignment #3 (Section I: Regular Expressions Using grep)