CSE 374 Lecture 7

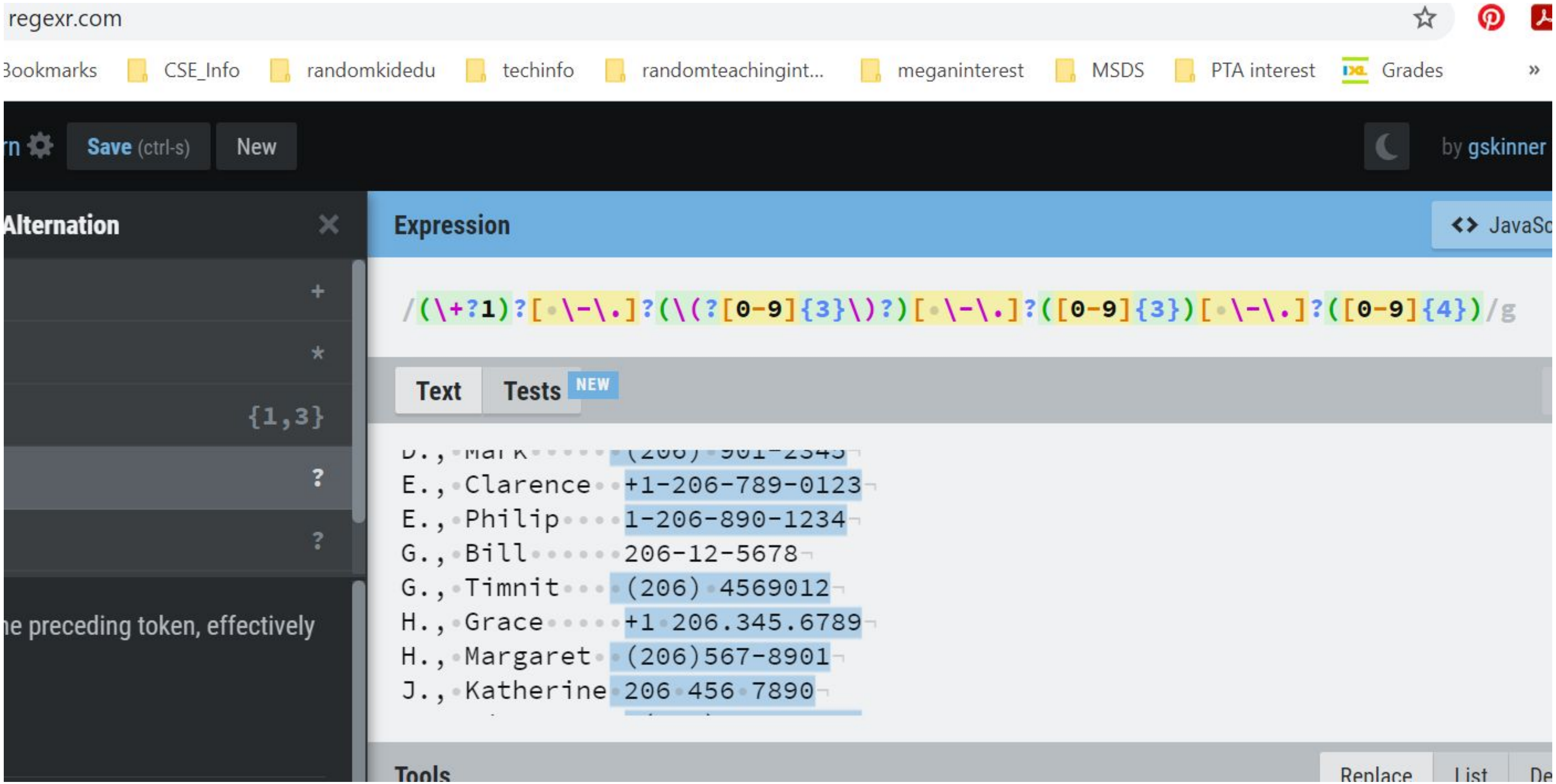
Regex and Sed

Regular expressions and Grep

Can you write a regular expression to identify every phone number?

\ : escape following character
'.' : matches any single character at least once
$p_1|p_2$: matches p_1 OR p_2
'*' : matches zero or more of the previous p
'?' : matches zero or one of the previous p $(\varepsilon|p)$
'+' : matches one or more of previous p (pp*)
() : group patterns for order of operations
{} : repeat n times
[] : contain literals to be matched (single or range)
^ : Anchors to beginning of line
$: anchors to end of line
<> : word boundaries

```
D., Mark        (206) 901-2345
E., Clarence   +1-206-789-0123
E., Philip     1-206-890-1234
G., Timnit      (206) 4569012
H., Grace      +1 206.345.6789
H., Margaret    (206)567-8901
J., Katherine  206 456 7890
L., Ada        (206) 123-4567
L.,Jerry       2061235678
O., Ellen      206 2346789
T., Alan       206-234-5678
W., Jeannette  206 678.9012
```



```
/(\+?1)?[ \-\.]?(\(?[0-9]{3}\)?)[ \-\.]?([0-9]{3})[ \-\.]?([0-9]{4})/g
```

```
E., Clarence  +1-206-789-0123
E., Philip    1-206-890-1234
G., Bill      206-12-5678
G., Timnit    (206) 4569012
H., Grace     +1 206.345.6789
H., Margaret  (206)567-8901
J., Katherine 206 456 7890
```

he preceding token, effectively

What is ‘sed’?

Run ‘man sed’ now!

Stream editor: makes basic text transformations on an input stream

Use ‘sed *command* file[s]’

Changes line by line, one pass through

Basic usage: sed

$ sed [OPTIONS] [COMMAND] [FILE]

$ input_stream | sed [COMMAND]

$ sed -i 's/original/replacement/g' test.txt

COMMAND

Input file

‘s’ - substitute

‘G’ - global

‘I’ - Replaces input file with updated version

Useful options:

-i : replace input file with edited version

-e : allows for multiple commands - applies each left to right (`sed -e 's/a/A/' -e 's/b/B/' <old >new`)

-f : reads command from a file

-n : suppresses output except when told otherwise

Omitting file applies [COMMAND] to stdin

Sed cycle

1. Read one line from input stream
2. Put in pattern space without trailing /n
3. Execute command
   a. commands with address are only executed if address is verified
4. Pattern space is printed to the output stream

Addresses

Addresses apply sed only to specific lines. Address comes before command.

Number : only that line number

$: last line of input

First~step : every ‘step’ lines starting with ‘first’

/regexp/ : only lines matching the regular expression

l1,l2: range - between line that matches l1, and line that matches l2 (l1&l2 can be numbers or regex)

Other types of commands

‘P’ : print this line (often used with ‘-n’ to suppress printing of non-marked lines)

‘d’ : delete this pattern space and continue

‘y’ : transliterate characters

‘a’: append text

‘i’ : insert text

‘c’ : replace text

```
sed -n 's/pattern/&/p' <file

$ echo hello world | sed
'y/abcdefghij/0123456789/'
74llo worl3$

$ seq 3 | sed '2i hello'
1
hello
2
3

$ seq 10 | sed '2,9c hello'
1
hello
10
```

sed - more ideas

- ➢ Sed encounters one line at a time, and does one pass of the input.
- ➢ Delimiter ‘/’ can be changed to anything, like ‘_’ or ‘:’ - may help if COMMAND contains many ‘/’
- ➢ Multi-line editing is possible, but painful, with sed (with ‘hold buffer’). Use another scripting program (like ‘awk’).
- ➢ Branches are also possibly (‘b’ and ‘t’ commands)
- ➢ Use backreferences (\1, \2 etc) to refer back to regex gathered with \(to \)

What about ‘awk’

Or perl? Or ed? Or ruby?

Special purpose language for text editing on an input stream. More programming concepts, used for bigger commands.

Many scripting choices, often with more functionality. Sed stands as the quickest, easiest, and standard on *nix systems for simple commands.

Up next

Introduction to C