



Regular Expressions

More Tools



Copyright © Software Carpentry 2010

This work is licensed under the Creative Commons Attribution License

See <http://software-carpentry.org/license.html> for more information.

Thousands of papers and theses written in LaTeX

Thousands of papers and theses written in LaTeX

Granger's work on graphs `\cite{dd-gr2007,gr2009}`, particularly ones obeying Snape's Inequality `\cite{snape87}` (but see `\cite{quirrell89}`), has opened up new lines of research. However, studies at Unseen University `\cite{stibbons2002,stibbons2008}` highlight several dangers.

`:` `:` `:` `:` `:`
`:` `:`

Thousands of papers and theses written in LaTeX

Granger's work on graphs `\cite{dd-gr2007,gr2009}`,
 particularly ones obeying Snape's Inequality
`\cite{snape87}` (but see `\cite{quirrell89}`),
 has opened up new lines of research. However,
 studies at Unseen University `\cite{stibbons2002,`
`stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
 ⋮ ⋮ ⋮ ⋮ ⋮

All share a common bibliography

Thousands of papers and theses written in LaTeX

Granger's work on graphs `\cite{dd-gr2007,gr2009}`,
 particularly ones obeying Snape's Inequality
`\cite{snape87}` (but see `\cite{quirrell89}`),
 has opened up new lines of research. However,
 studies at Unseen University `\cite{stibbons2002,`
`stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
 ⋮ ⋮ ⋮ ⋮ ⋮

All share a common bibliography

Want to see how often citations appear together

Thousands of papers and theses written in LaTeX

Granger's work on graphs `\cite{dd-gr2007,gr2009}`,
 particularly ones obeying Snape's Inequality
`\cite{snape87}` (but see `\cite{quirrell89}`),
 has opened up new lines of research. However,
 studies at Unseen University `\cite{stibbons2002,`
`stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
 ⋮ ⋮ ⋮ ⋮ ⋮

All share a common bibliography

Want to see how often citations appear together

First step: extract citation sets from documents

Citations enclosed in \cite{...}

Granger's work on graphs `\cite{dd-gr2007,gr2009}`, particularly ones obeying Snape's Inequality `\cite{snape87}` (but see `\cite{quirrell89}`), has opened up new lines of research. However, studies at Unseen University `\cite{stibbons2002,stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
⋮ ⋮ ⋮ ⋮ ⋮

Citations enclosed in \cite{...}

Granger's work on graphs `\cite{dd-gr2007,gr2009}`, particularly ones obeying Snape's Inequality `\cite{snape87}` (but see `\cite{quirrell89}`), has opened up new lines of research. However, studies at Unseen University `\cite{stibbons2002,stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
⋮ ⋮ ⋮ ⋮ ⋮

Multiple labels separated by commas

Citations enclosed in `\cite{...}`

Granger's work on graphs `\cite{dd-gr2007,gr2009}`,
particularly ones obeying Snape's Inequality
`\cite{ snape87 }` (but see `\cite{quirrell89}`),
has opened up new lines of research. However,
studies at Unseen University `\cite{stibbons2002,`
`stibbons2008}` highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
⋮ ⋮ ⋮ ⋮ ⋮

Multiple labels separated by commas

May be white space

Citations enclosed in \cite{...}

Granger's work on graphs \cite{dd-gr2007,gr2009}, particularly ones obeying Snape's Inequality \cite{snape87} (but see \cite{quirrell89}), has opened up new lines of research. However, studies at Unseen University \cite{stibbons2002,stibbons2008} highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮

Multiple labels separated by commas

May be white space (including line breaks)

Citations enclosed in \cite{...}

Granger's work on graphs \cite{dd-gr2007,gr2009}, particularly ones obeying Snape's Inequality \cite{snape87} (but see \cite{quirrell89}), has opened up new lines of research. However, studies at Unseen University \cite{stibbons2002,stibbons2008} highlight several dangers.

⋮ ⋮ ⋮ ⋮ ⋮
⋮ ⋮ ⋮ ⋮ ⋮

Multiple labels separated by commas

May be white space (including line breaks)

And multiple citations per line

Idea #1: capture everything in `cite{...}` in a group

```
print re.search('cite{(.+)}', 'a \\cite{X} b').groups()  
( 'X', )
```

Idea #1: capture everything in `cite{...}` in a group

```
print re.search('cite{(.+)}', 'a \\cite{X} b').groups()
('X',)
```

What about multiple citations?

```
print re.search('cite{(.+)}', 'a \\cite{X} b \\cite{Y} c').gro
('X} b \\cite{Y',)
```

Idea #1: capture everything in `cite{...}` in a group

```
print re.search('cite{(.+)}', 'a \\cite{X} b').groups()
('X',)
```

What about multiple citations?

```
print re.search('cite{(.+)}', 'a \\cite{X} b \\cite{Y} c').gro
('X} b \\cite{Y',)
```

Idea #1: capture everything in `cite{...}` in a group

```
print re.search('cite{(.+)}', 'a \\cite{X} b').groups()
('X',)
```

What about multiple citations?

```
print re.search('cite{(.+)}', 'a \\cite{X} b \\cite{Y} c').gro
('X} b \\cite{Y',)
```

Matching is *greedy*

Idea #2: match everything inside '{}' except '}'

Idea #2: match everything inside '{}' except '}'

Use '['^{' to negate the set containing only '}'

Idea #2: match everything inside '{}' except '}'


Use '['^']' to negate the set containing only '}'

```
print re.search('cite{([^}]+)}', 'a \\cite{X} b').groups()  
( 'X', )
```

Idea #2: match everything inside '{}' except '}'

Use '['^']' to negate the set containing only '}'

```
print re.search('cite{([^}]++)}', 'a \\cite{X} b').groups()  
('X',)
```



Idea #2: match everything inside '{}' except '}'

Use '['^']' to negate the set containing only '}'

```
print re.search('cite{([{}]+)}', 'a \\cite{X} b').groups()  
( 'X', )
```

What about multiple citations?

Idea #2: match everything inside '{}' except '}'

Use '['^']' to negate the set containing only '}'

```
print re.search('cite{([{}]+)}', 'a \\cite{X} b').groups()
('X',)
```

What about multiple citations?

```
print re.search('cite{([{}]+)}', 'a \\cite{X} b \\cite{Y} c').
('X',)
```

Idea #2: match everything inside '{}' except '}'

Use '['^']' to negate the set containing only '}'

```
print re.search('cite{([{}]+)}', 'a \\cite{X} b').groups()
('X',)
```

What about multiple citations?

```
print re.search('cite{([{}]+)}', 'a \\cite{X} b \\cite{Y} c').
('X',)
```

Need to extract all matches, not just the first

Idea #3: use `re.findall` instead of `re.search`

Idea #3: use `re.findall` instead of `re.search`

"A programmer is only as good as her knowledge of her language's libraries."

Idea #3: use `re.findall` instead of `re.search`

"A programmer is only as good as her knowledge of her language's libraries."

```
print re.findall('cite{([^\}]+)}', 'a \\cite{X} b \\cite{Y} c')  
['X', 'Y']
```

Idea #3: use `re.findall` instead of `re.search`

"A programmer is only as good as her knowledge of her language's libraries."

```
print re.findall('cite{([^\}]+)}', 'a \\cite{X} b \\cite{Y} c')
```

```
['X', 'Y']
```



Idea #3: use `re.findall` instead of `re.search`

"A programmer is only as good as her knowledge of her language's libraries."

```
print re.findall('cite{([^\}]+)}', 'a \\cite{X} b \\cite{Y} c')
['X', 'Y']
```

What about spaces?

Idea #3: use `re.findall` instead of `re.search`

"A programmer is only as good as her knowledge of her language's libraries."

```
print re.findall('cite{([^\}]+)}', 'a \\cite{X} b \\cite{Y} c')
['X', 'Y']
```

What about spaces?

```
print re.search('cite{([^\}]+)}', 'a \\cite{ X} b \\cite{Y } c')
[' X', 'Y ']
```

Could tidy this up after matching using `string.strip()`

Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

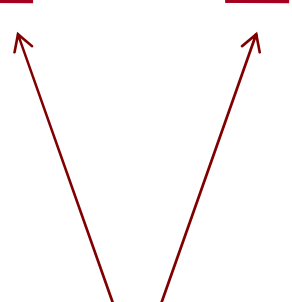
```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci  
[ 'X', 'Y ']
```

Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci
```

`['X', 'Y ']`



Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci
['X', 'Y ']
```

Still capturing the space after 'Y'

Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci
['X', 'Y ']
```

Still capturing the space after 'Y'

Match the word-to-nonword transition as well

Could tidy this up after matching using `string.strip()`

Let's modify the pattern instead

```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci
['X', 'Y ']
```

Still capturing the space after 'Y'

Match the word-to-nonword transition as well

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', 'a \\cite{ X}
[' X', 'Y']
```

Could tidy this up after matching using `string.strip()`


Let's modify the pattern instead

```
print re.findall('cite{\\s*([\\^}]+)\\s*}', 'a \\cite{ X} b \\ci
['X', 'Y ']
```

Still capturing the space after 'Y'

Match the word-to-nonword transition as well

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', 'a \\cite{ X}
[' X', 'Y']
```



What about multiple labels in a single citation?

What about multiple labels in a single citation?

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', '\\cite{X,Y} '
                ['X,Y'])
```

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', '\\cite{X, Y, '
                ['X, Y, Z'])
```

What about multiple labels in a single citation?

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', '\\cite{X,Y} '
['X,Y']
```

```
print re.findall('cite{\\s*\\b([\\^}]+)\\b\\s*}', '\\cite{X, Y, '
['X, Y, Z']
```

Actually can be done, but it's very complex

What about multiple labels in a single citation?

```
print re.findall('cite{\\s*\\b([^}]+)\\b\\s*}', '\\cite{X,Y}'  
                ['X,Y'])
```

```
print re.findall('cite{\\s*\\b([^}]+)\\b\\s*}', '\\cite{X, Y,'  
                ['X, Y, Z'])
```

Actually can be done, but it's very complex

Use `re.split()` to break matches on `'\\s*,\\s*'`

Start with a working skeleton.

```
def get_citations(text):
    '''Return the set of all citation tags found in a block of text
    return set()
```

```
if __name__ == '__main__':
```

```
    test = '''\
Granger's work on graphs \cite{dd-gr2007,gr2009},
particularly ones obeying Snape's Inequality
\cite{snape87} (but see \cite{quirrell89}),
has opened up new lines of research. However,
studies at Unseen University \cite{stibbons2002,
stibbons2008} highlight several dangers.'''
```

```
    print get_citations(test)
```

set([])

```
import re

CITE = 'cite{\\s*\\b([^}]+)\\b\\s*}'
SPLIT = '\\s*,\\s*'

def get_citations(text):
    '''Return the set of all citation tags found in a block of text'''
    result = set()
    match = re.findall(CITE, text)
    if match:
        for citation in match:
            cites = re.split(SPLIT, citation)
            for c in cites:
                result.add(c)

    return result
```

```
import re

CITE = re.compile('cite{\\s*\\b([^}]+)\\b\\s*}')
SPLIT = re.compile('\\s*,\\s*')

def get_citations(text):
    '''Return the set of all citation tags found in a block of text'''
    result = set()
    match = CITE.findall(text)
    if match:
        for citations in match:
            label_list = SPLIT.split(citations)
            for label in label_list:
                result.add(label)

    return result
```

```
import re

CITE = re.compile('cite{\\s*\\b([^}]+)\\b\\s*}')
SPLIT = re.compile('\\s*,\\s*')

def get_citations(text):
    '''Return the set of all citation tags found in a block of text'''
    result = set()
    match = CITE.findall(text)
    if match:
        for citations in match:
            label_list = SPLIT.split(citations)
            for label in label_list:
                result.add(label)

    return result
```

Now test it all out.

```
if __name__ == '__main__':
    test = '''\
Granger's work on graphs \cite{dd-gr2007,gr2009},
particularly ones obeying Snape's Inequality
\cite{snape87} (but see \cite{quirrell89}),
has opened up new lines of research. However,
studies at Unseen University \cite{stibbons2002,
stibbons2008} highlight several dangers.'''

    print get_citations(test)

    set(['gr2009', 'stibbons2002', 'dd-gr2007', 'stibbons2008',
        'snape87', 'quirrell89'])
```



created by

Greg Wilson

June 2010



Copyright © Software Carpentry 2010

This work is licensed under the Creative Commons Attribution License

See <http://software-carpentry.org/license.html> for more information.