

Status:	Closed	
Priority:	Normal	
Assignee:		
Target version:		
ruby -v:	ruby 3.0.2p107 (2021-07-07 revision 0db68f0233) [x86_64-linux-gnu]	Backport: 3.2: UNKNOWN, 3.3: UNKNOWN, 3.4: UNKNOWN

Description

This is my first bug subscription, please feel free to tell me if I can do anything better.

Description

Attempting to use "variable" repetition quantifiers (?, +, \*, {n}, ...) inside lookbehind anchors raises a **SyntaxError** (invalid pattern in look-behind), but it's perfectly viable to do it in lookahead anchors.

Examples of lookahead working:

```
irb(main):100> "axb".split /(?=x)/
=> ["a", "xb"]
irb(main):101> "axb".split /(?=x?)/
=> ["a", "x", "b"]
irb(main):102> "axb".split /(?=x+)/
=> ["a", "xb"]
irb(main):103> "axb".split /(?=x*)/
=> ["a", "x", "b"]
irb(main):104> "axb".split /(?=x{1,})/
=> ["a", "xb"]
irb(main):105> "axb".split /(?=x{1,1})/
=> ["a", "x", "b"]
irb(main):106> "axb".split /(?=x{1,2})/
=> ["a", "xb"]
```

Examples of lookbehind working only with non-variable metacharacters:

```
irb(main):107> "axb".split /(?<=x)/
=> ["ax", "b"]
irb(main):108> "axb".split /(?<=x?)/
/var/lib/gems/3.0.0/gems/irb-1.14.0/exe/irb:9:in
`<top (required)>': (irb):108: invalid pattern in look-behind: /(?<=x?)/ (SyntaxError)
from /usr/local/bin/irb:25:in `load'
from /usr/local/bin/irb:25:in `<main>'
irb(main):109> "axb".split /(?<=x*)/
/var/lib/gems/3.0.0/gems/irb-1.14.0/exe/irb:9:in
`<top (required)>': (irb):109: invalid pattern in look-behind: /(?<=x*)/ (SyntaxError)
from /usr/local/bin/irb:25:in `load'
from /usr/local/bin/irb:25:in `<main>'
irb(main):110> "axb".split /(?<=x{1,})/
/var/lib/gems/3.0.0/gems/irb-1.14.0/exe/irb:9:in
`<top (required)>': (irb):110: invalid pattern in look-behind: /(?<=x{1,})/ (SyntaxError)
from /usr/local/bin/irb:25:in `load'
from /usr/local/bin/irb:25:in `<main>'
irb(main):111> "axb".split /(?<=x{1,1})/
/var/lib/gems/3.0.0/gems/irb-1.14.0/exe/irb:9:in
`<top (required)>': (irb):111: invalid pattern in look-behind: /(?<=x{1,1})/ (SyntaxError)
from /usr/local/bin/irb:25:in `load'
from /usr/local/bin/irb:25:in `<main>'
irb(main):112> "axb".split /(?<=x{1,2})/
/var/lib/gems/3.0.0/gems/irb-1.14.0/exe/irb:9:in
```

```
`<top (required)>': (irb):112: invalid pattern in look-behind: /(?!<=x{1,2})/ (SyntaxError)
from /usr/local/bin/irb:25:in `load'
from /usr/local/bin/irb:25:in `<main>'
irb(main):113> "axb".split /(?!<=x{1})/
=> ["ax", "b"]
irb(main):114> "axb".split /(?!<=x{1,1})/
=> ["ax", "b"]
```

## Note

I have searched on the internet and, to my knowledge, this behavior is not intended. (This documentation page on regular expressions)[[https://ruby-doc.org/core-3.1.0/doc/regexp\\_rdoc.html](https://ruby-doc.org/core-3.1.0/doc/regexp_rdoc.html)], for example, does not say anything about limitations specific to lookbehinds.

### Associated revisions

#### Revision b2fdd264 - 07/11/2025 06:19 AM - mame (Yusuke Endoh)

Lookbehind regexp must be fixed-length

Fixes [Bug #21507]

### History

#### #1 - 07/11/2025 03:36 AM - mame (Yusuke Endoh)

- Status changed from Open to Feedback

This is currently an intended implementation limitation.

This behavior comes from the specifications of Onigmo, which Ruby's regular expression engine is based on. The Onigmo documentation states the following about look-behinds:

(?!<=subexp)	look-behind
(?!<subexp)	negative look-behind

Subexp of look-behind must be fixed-width.  
But top-level alternatives can be of various lengths.  
ex. (?!<=a|bc) is OK. (?!<=aaa(?:b|cd)) is not allowed.

<https://github.com/k-takata/Onigmo/blob/1d7ee878b3e4a9e41bf9825c937ae6cf0a9cd68c/doc/RE#L267-L272>

I'm hesitant about whether we should add Onigmo's detailed implementation specifics to the Ruby documentation. However, seeing that there's already a precedent for it, I've opened a PR for now.

<https://github.com/ruby/ruby/pull/13857>

#### #2 - 07/11/2025 03:36 AM - mame (Yusuke Endoh)

- Status changed from Feedback to Open

#### #3 - 07/11/2025 06:19 AM - mame (Yusuke Endoh)

- Status changed from Open to Closed

Applied in changeset [git|b2fdd26417d1539014c7af499ab1f9b398eca4c0](https://github.com/ruby/ruby/pull/13857).

Lookbehind regexp must be fixed-length

Fixes [Bug [#21507](#)]