Essential Perl One-Liners

Walter C. Mankowski

Department of Computer Science
Drexel University
Philadelphia, PA

YAPC::NA Columbus
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Why One-Liners?

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A lot of work has been done on tools and techniques to get around that.

Perl’s still great for throwing together quick and dirty little programs.

Nothing’s quicker and dirtier than the one-liner.
But I’m a Java programmer!
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  - less, wc, sort, xargs, sed, tr, cut, tee, etc.
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The Unix command-line environment is incredibly powerful:
- everything is ASCII
- create new “programs” by connecting small, simple existing programs in pipelines
- less, wc, sort, xargs, sed, tr, cut, tee, etc.

Perl fits really well into this niche.
Freeing your time for more important things . . .
Freeing your time for more important things . . .
Perl One-Liners 101
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(Cell phones off?)
Hello, world

```perl
% perl -e 'print "Hello, world.\n"'
```
Hello, world

% perl -e 'print "Hello, world.\n"'
Hello, world.
%

- `-e` to enter the program on the command line
- Enclose program in single quotes to avoid shell expansion (double quotes on Windows)
- You don't need the final semicolon
- No `strict`
- No `warnings`
- No `tests`
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- `no strict`
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Hello, world

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Hello, world.
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- -e to enter the program on the command line
- enclose program in single quotes to avoid shell expansion
  (double quotes on Windows)
- you don’t need the final semicolon
- no strict
- no warnings
- no tests
That’s it!

- That’s all you need to know.
That’s it!
That’s it!

- That’s all you need to know.
That’s all you need to know.

The rest of this talk is all about syntactic sugar to make one-liners easier to write.
Perl programmers love syntactic sugar.
Perl programmers love syntactic sugar.
The `-l` flag automatically adds a newline to whatever you print.

**Without `-l`**

```perl
perl -e 'print "Hello, world.\n"'
```
Automatic newlines with -l

The -l flag automatically adds a newline to whatever you print.

**Without -l**

```perl
perl -e 'print "Hello, world.\n"'
```

**With -l**

```perl
perl -le 'print "Hello, world."'
```
Perl 5.10 introduced a new builtin function, `say`, that works just like `print` except that it automatically adds a newline.
Perl 5.10 introduced a new builtin function, `say`, that works just like `print` except that it automatically adds a newline. Sadly, `say` doesn’t work with `-e`:

```
% perl -e 'say "Hello, world."'
```

String found where operator expected at -e line 1, near "say "Hello, world.""

(Do you need to predeclare `say`?)

syntax error at -e line 1, near "say "Hello, world.""

Execution of -e aborted due to compilation errors.

%
To avoid breaking backward compatibility, `say` is turned off by default in 5.10.
To avoid breaking backward compatibility, `say` is turned off by default in 5.10.
To turn it on from the command line, use `-E` instead of `-e`:

```perl
% perl -E 'say "Hello, world."'
Hello, world.
%
```
Writing Loops

Suppose you want to see if your team is following your new coding standards that lines can’t be longer than 80 characters. Here’s one way to write that:

```
perl -e 'while (<>){print if length > 80}' *.pl
```
The \texttt{-n} flag

That gets tedious to write that all the time, so perl has a \texttt{-n flag} that automatically puts a loop around your code. It’s equivalent to

\begin{verbatim}
while {<>} {
    ...  # your code goes here
}
\end{verbatim}
The \texttt{-n} flag

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The `-n` flag

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```perl
while {<>} {
    ... # your code goes here
}
```

**Without `-n`**

```bash
perl -e 'while (<>) {print if length > 80}' *.pl
```

**With `-n`**

```bash
perl -ne 'print if length > 80' *.pl
```
BEGIN and END blocks

If you want to do pre- or post-processing when using the `-n` flag, use BEGIN and END blocks. For example, if the file `nums` contains

1
2
3
4
BEGIN and END blocks (continued)

Sum

% perl -lne '$s += $_; END{print $s}' nums
10
%

### BEGIN and END blocks (continued)

#### Sum

```perl
% perl -lne '$s += $_; END{print $s}' nums
10
%
```

#### Product

```perl
% perl -lne 'BEGIN{$p = 1} $p *= $_; END{print $p}'
nums
24
%
```
Suppose you want to convert an existing file to lowercase. Now that you know about the \texttt{-n} flag, you might try writing it like this:

\begin{verbatim}
perl -ne 'tr/A-Z/a-z/; print' foo 
\end{verbatim}
Suppose you want to convert an existing file to lowercase. Now that you know about the `−n` flag, you might try writing it like this:

```perl
perl −ne 'tr/A−Z/a−z/; print’ foo
perl −ne 'tr/A−Z/a−z/; print’ foo >foo.out
```
The \texttt{-p} flag

Printing each line is a common enough operation that perl has a special flag for it, the \texttt{-p flag}. It’s equivalent to

\begin{verbatim}
while {<>} {
  ... # your code goes here
} continue {
  print or die "-p destination: $!\n";
}
\end{verbatim}
The -p flag

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```perl
while {<>} {
    ...
    # your code goes here
} continue {
    print or die "-p destination: $!
"; 
}
```

It’s similar to the -n flag, except -p prints out each line:

<table>
<thead>
<tr>
<th>Without -p</th>
</tr>
</thead>
<tbody>
<tr>
<td>perl -ne 'tr/A-Z/a-z/; print' foo</td>
</tr>
</tbody>
</table>
The `-p` flag

Printing each line is a common enough operation that perl has a special flag for it, the `-p` flag. It’s equivalent to

```perl
while {<>} {
    ... # your code goes here
} continue {
    print or die "-p destination: $!
";
}
```

It’s similar to the `-n` flag, except `-p` prints out each line:

**Without `-p`**

```perl
perl -ne 'tr/A-Z/a-z/; print' foo
```

**With `-p`**

```perl
perl -pe 'tr/A-Z/a-z/' foo
```
Advanced Perl One-Liners
Editing files “in-place”

Instead of just printing out the file, one thing you might want to do with the \texttt{-p} flag is make the changes directly to the file. Perl’s \texttt{-i} flag does exactly that:
Editing files “in-place”

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Print to stdout

```perl
perl -pe 's/foo/bar/' a.pl
```
Instead of just printing out the file, one thing you might want to do with the `-p` flag is make the changes directly to the file. Perl’s `-i` flag does exactly that:

**Print to stdout**

```
perl -pe 's/foo/bar/' a.pl
```

**Edit a.pl “in-place”**

```
perl -pi -e 's/foo/bar/' a.pl
```
Instead of just printing out the file, one thing you might want to do with the `-p` flag is make the changes directly to the file. Perl’s `-i` flag does exactly that:

**Print to stdout**

```bash
perl -pe 's/foo/bar/' a.pl
```

**Edit a.pl “in-place”**

```bash
perl -pi -e 's/foo/bar/' a.pl
```

**Editing multiple files**

```bash
perl -pi -e 's/foo/bar/' *.pl
```
Editing files “in-place”

Obviously the -i flag is dangerous since it clobbers whatever was originally in the file. So Perl lets you specify a backup file when using -i.
Editing files “in-place”

Obviously the –i flag is dangerous since it clobbers whatever was originally in the file. So Perl lets you specify a backup file when using –i.

```
perl -pi -e 's/foo/bar/' a.pl
```

Original file saved in `a.pl.bak`

```
perl -p -i.bak -e 's/foo/bar/' a.pl
```
Editing files “in-place”

Obviously the \(-i\) flag is dangerous since it clobbers whatever was originally in the file. So Perl lets you specify a backup file when using \(-i\).

**Edit a.pl “in-place”**

```
perl -pi -e 's/foo/bar/' a.pl
```

**Original file saved in a.pl.bak**

```
perl -p -i.bak -e 's/foo/bar/' a.pl
```
Automatically splitting files

Use the `-a` flag to automatically split each line (like AWK). Default is to split on `''`; use the `-F` flag to split on something else.
Use the \texttt{-a} flag to automatically split each line (like AWK). Default is to split on \textquote{'}\textquote{'}; use the \texttt{-F} flag to split on something else.

Print processes whose parents are init

\begin{verbatim}
ps axl | perl -ane 'print if $F[3] == 1'
\end{verbatim}
Use the **-a flag** to automatically split each line (like AWK). Default is to split on ' '; use the **-F flag** to split on something else.

**Print processes whose parents are init**

```
ps axl | perl -ane 'print if $F[3] == 1'
```

**Print all userids and user names**

```
perl -aln -F: -e 'print "$F[2]\t$F[0]"' /etc/passwd
```
Instead of explicitly use’ing a module, you can load a module from the command line with the \texttt{-M flag}.

The following programs both do the same thing:

\begin{verbatim}
perl -e ’use LWP::Simple; getprint "http://pghpw.org"'
\end{verbatim}
Instead of explicitly use’ing a module, you can load a module from the command line with the \texttt{-M} flag.

The following programs both do the same thing:

\begin{verbatim}
Use module
perl -e 'use LWP::Simple; getprint "http://pghpw.org"'

-M flag
perl -MLWP::Simple -e 'getprint "http://pghpw.org"'
\end{verbatim}
That’s still kind of ugly. One trick to simplify it further is to put modules you commonly use in one-liners into y.pm:

```perl
use LWP::Simple;
1;
```
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```perl
y.pm
use LWP::Simple;
1;
```

Now instead of this:

```bash
perl -MLWP::Simple -e 'getprint "http://pghpw.org"'
```
That’s still kind of ugly. One trick to simply it further is to put modules you commonly use in one-liners into y.pm:

```perl
y.pm
use LWP::Simple;
1;
```

Now instead of this:

```perl
perl -MLWP::Simple -e 'getprint "http://pghpw.org"'
```

you can write this:

```perl
perl -My -e 'getprint "http://pghpw.org"'
```
Perl normally reads input until it hits the “input record separator”, which defaults to \n and can be changed by setting $/.

But in addition to setting $/ in a BEGIN block, you can also change it on the command line with the -0 flag. It sets $/ to an octal or hex number:
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But in addition to setting $/ in a BEGIN block, you can also change it on the command line with the -0 flag. It sets $/ to an octal or hex number:

-0x0d    carriage returns
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-0x0d    carriage returns
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-0x0d   carriage returns
-0      null character (find -print0)
-00     paragraph mode (useful for Postfix logs)
Perl normally reads input until it hits the “input record separator”, which defaults to \n and can be changed by setting $/. But in addition to setting $/ in a BEGIN block, you can also change it on the command line with the `-0` flag. It sets $/ to an octal or hex number:

- `0x0d` carriage returns
- `-0` null character (find `-print0`)
- `-00` paragraph mode (useful for Postfix logs)
- `-0777` slurp in entire file
## Summary of flags

<table>
<thead>
<tr>
<th>Flag</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>-e</td>
<td>Execute program on command line</td>
</tr>
<tr>
<td>-l</td>
<td>Automatically add newlines</td>
</tr>
<tr>
<td>-n</td>
<td>Automatically loop</td>
</tr>
<tr>
<td>-p</td>
<td>Automatically loop and print each line</td>
</tr>
<tr>
<td>-i</td>
<td>Edit files in-place</td>
</tr>
<tr>
<td>-a</td>
<td>Automatically split input</td>
</tr>
<tr>
<td>-M</td>
<td>Use module</td>
</tr>
<tr>
<td>-0</td>
<td>Change input record separator</td>
</tr>
</tbody>
</table>
perl -h
- print summary of perl’s command-line options
More Information

- `perl -h`
  - print summary of perl’s command-line options
- `perldoc perlrunc`
  - many more features than I covered
perl -h
  - print summary of perl’s command-line options
perldoc perlroutine
  - many more features than I covered
Google for “perl one liners”
  - Tom Christiansen one-liners
  - article by Jeff Bay in The Perl Review
  - “One-liners 101” on IBM developerWorks
  - @perloneliner on Twitter
  - many others
Java doesn’t have one-liners

public class Scared {
    public void wetPants() {
        ...  
    }

Quentin Tarantino’s “Learn Java in a Minute”
Examples!
Palindromes

Find palindromes

```perl
perl -lne 'print if $_[0] eq reverse' /usr/share/dict/words
```
Line Numbers

Print lines preceded by line number

perl -ne 'print "$. $."'

$. is a special Perl variable that contains the input line number.
Line Numbers

Print lines preceded by line number

perl -ne 'print "$. $_"'

$. is a special Perl variable that contains the input line number.

Simpler way to do it...

cat -n
Computing Averages

Sum lines, then divide by total number of lines

```perl
% perl -lne '$s += $_; END{print $s/$.}' nums
2.5
%
```
Printing selected lines

Print lines 10–20

perl -ne 'print if 10..20'

The .. operator is magic when used in scalar context. Read the “Range Operators” section in perlop.
Grep with Perl regular expressions

Poor man's grep

```perl
perl -ne 'print if /^foobaz/'
```

. . . but with the full power of Perl's regular expressions!

Lines with foo not followed by bar

```perl
perl -ne 'print if /foo(?!bar)/'
```

Lines with bar not preceded by foo

```perl
perl -ne 'print if /(?<!foo)bar/'
```

Grep on paragraphs

```perl
perl -00 -ne 'print if /foo(?!bar)/'
```
Grep with Perl regular expressions

**Poor man’s grep**
```perl
perl -ne 'print if /^foobar/'
```

...but with the full power of Perl’s regular expressions!

**Lines with foo not followed by bar**
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perl -ne 'print if /foo(?!bar)/'
```
Grep with Perl regular expressions

**Poor man’s grep**

perl -ne 'print if /^foob\bar/'

...but with the full power of Perl’s regular expressions!

**Lines with foo not followed by bar**

perl -ne 'print if /foo(?!bar)/'

**Lines with bar not preceded by foo**

perl -ne 'print if /(?!foo)bar/'
Grep with Perl regular expressions

**Poor man’s grep**

```
perl -ne 'print if /^foobar/'
```

...but with the full power of Perl’s regular expressions!

**Lines with foo not followed by bar**

```
perl -ne 'print if /foo(!bar)/'
```

**Lines with bar not preceded by foo**

```
perl -ne 'print if /(!foo)bar/'
```

**Grep on paragraphs**

```
perl -00 -ne 'print if /foo(!bar)/'
```
Random Numbers

Does `rand()` return the same sequence with the same seed on different platforms?
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Does `rand()` return the same sequence with the same seed on different platforms?

Look at the first 5

% perl -le 'srand(42); print rand for 1..5'
0.744525000061007
0.342701478718908
0.111085282444161
0.422338957988309
0.0811111711783106
Random Numbers

Does `rand()` return the same sequence with the same seed on different platforms?

**Look at the first 5**

```perl
% perl -le 'srand(42); print rand for 1..5'
0.744525000061007
0.342701478718908
0.111085282444161
0.422338957988309
0.0811111711783106
```

**Try a whole bunch**

```bash
% perl -le 'srand(42); print rand for 1..100_000' | md5sum
ac18d07f40c858bf4b23090177f6a685 -
```
Stacking the deck

One-liners can also be used in shell scripts

```bash
#!/bin/bash

SEED='perl -le 'print int rand 0xffffffff''

for ((n = 10; n <= 400; n += 10)) do
  cmd="./wn_path_seq $n $SEED"
  echo $cmd
  $cmd
done
```
Add lines to file

Add line to beginning of file

```
perl -0777 -i -ne 'print "first\n$_"' test.txt
```
Add lines to file

Add line to beginning of file
perl -0777 -i -ne 'print "first\n$_"' test.txt

Same thing
perl -0777 -i -pe '$_= "first\n$_"' test.txt
Add lines to file

### Add line to beginning of file
```
perl -0777 -i -ne 'print "first\n$_"' test.txt
```

### Same thing
```
perl -0777 -i -pe '$_= "first\n$_"' test.txt
```

### Same thing, more obfuscated
```
perl -0777 -i -pe 's//first\n/' test.txt
```
Thank you!