

**NAME**

perlfaq - frequently asked questions about Perl

**VERSION**

version 5.021009

**DESCRIPTION**

The perlfaq comprises several documents that answer the most commonly asked questions about Perl and Perl programming. It's divided by topic into nine major sections outlined in this document.

**Where to find the perlfaq**

The perlfaq is an evolving document. Read the latest version at <http://learn.perl.org/faq/>. It is also included in the standard Perl distribution.

**How to use the perlfaq**

The `perldoc` command line tool is part of the standard Perl distribution. To read the perlfaq:

```
$ perldoc perlfaq
```

To search the perlfaq question headings:

```
$ perldoc -q open
```

**How to contribute to the perlfaq**

Review <https://github.com/perl-doc-cats/perlfaq/wiki>. If you don't find your suggestion create an issue or pull request against <https://github.com/perl-doc-cats/perlfaq>.

Once approved, changes are merged into <https://github.com/tpf/perlfaq>, the repository which drives <http://learn.perl.org/faq/>, and they are distributed with the next Perl 5 release.

**What if my question isn't answered in the FAQ?**

Try the resources in *perlfaq2*.

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**THE QUESTIONS****perlfaq1: General Questions About Perl**

This section of the FAQ answers very general, high-level questions about Perl.

- What is Perl?
- Who supports Perl? Who develops it? Why is it free?
- Which version of Perl should I use?

- What are Perl 4, Perl 5, or Perl 6?
- What is Perl 6?
- How stable is Perl?
- How often are new versions of Perl released?
- Is Perl difficult to learn?
- How does Perl compare with other languages like Java, Python, REXX, Scheme, or Tcl?
- Can I do [task] in Perl?
- When shouldn't I program in Perl?
- What's the difference between "perl" and "Perl"?
- What is a JAPH?
- How can I convince others to use Perl?

## **perlfaq2: Obtaining and Learning about Perl**

This section of the FAQ answers questions about where to find source and documentation for Perl, support, and related matters.

- What machines support Perl? Where do I get it?
- How can I get a binary version of Perl?
- I don't have a C compiler. How can I build my own Perl interpreter?
- I copied the Perl binary from one machine to another, but scripts don't work.
- I grabbed the sources and tried to compile but gdbm/dynamic loading/malloc/linking/... failed. How do I make it work?
- What modules and extensions are available for Perl? What is CPAN?
- Where can I get information on Perl?
- What is perl.com? Perl Mongers? pm.org? perl.org? cpan.org?
- Where can I post questions?
- Perl Books
- Which magazines have Perl content?
- Which Perl blogs should I read?
- What mailing lists are there for Perl?
- Where can I buy a commercial version of Perl?
- Where do I send bug reports?

## **perlfaq3: Programming Tools**

This section of the FAQ answers questions related to programmer tools and programming support.

- How do I do (anything)?
- How can I use Perl interactively?
- How do I find which modules are installed on my system?

- How do I debug my Perl programs?
- How do I profile my Perl programs?
- How do I cross-reference my Perl programs?
- Is there a pretty-printer (formatter) for Perl?
- Is there an IDE or Windows Perl Editor?
- Where can I get Perl macros for vi?
- Where can I get perl-mode or cperl-mode for emacs?
- How can I use curses with Perl?
- How can I write a GUI (X, Tk, Gtk, etc.) in Perl?
- How can I make my Perl program run faster?
- How can I make my Perl program take less memory?
- Is it safe to return a reference to local or lexical data?
- How can I free an array or hash so my program shrinks?
- How can I make my CGI script more efficient?
- How can I hide the source for my Perl program?
- How can I compile my Perl program into byte code or C?
- How can I get `#!perl` to work on [MS-DOS,NT,...]?
- Can I write useful Perl programs on the command line?
- Why don't Perl one-liners work on my DOS/Mac/VMS system?
- Where can I learn about CGI or Web programming in Perl?
- Where can I learn about object-oriented Perl programming?
- Where can I learn about linking C with Perl?
- I've read `perlembed`, `perlguits`, etc., but I can't embed perl in my C program; what am I doing wrong?
- When I tried to run my script, I got this message. What does it mean?
- What's MakeMaker?

#### **perlfaq4: Data Manipulation**

This section of the FAQ answers questions related to manipulating numbers, dates, strings, arrays, hashes, and miscellaneous data issues.

- Why am I getting long decimals (eg, 19.9499999999999) instead of the numbers I should be getting (eg, 19.95)?
- Why is `int()` broken?
- Why isn't my octal data interpreted correctly?
- Does Perl have a `round()` function? What about `ceil()` and `floor()`? Trig functions?
- How do I convert between numeric representations/bases/radixes?

- Why doesn't & work the way I want it to?
- How do I multiply matrices?
- How do I perform an operation on a series of integers?
- How can I output Roman numerals?
- Why aren't my random numbers random?
- How do I get a random number between X and Y?
- How do I find the day or week of the year?
- How do I find the current century or millennium?
- How can I compare two dates and find the difference?
- How can I take a string and turn it into epoch seconds?
- How can I find the Julian Day?
- How do I find yesterday's date?
- Does Perl have a Year 2000 or 2038 problem? Is Perl Y2K compliant?
- How do I validate input?
- How do I unescape a string?
- How do I remove consecutive pairs of characters?
- How do I expand function calls in a string?
- How do I find matching/nesting anything?
- How do I reverse a string?
- How do I expand tabs in a string?
- How do I reformat a paragraph?
- How can I access or change N characters of a string?
- How do I change the Nth occurrence of something?
- How can I count the number of occurrences of a substring within a string?
- How do I capitalize all the words on one line?
- How can I split a [character]-delimited string except when inside [character]?
- How do I strip blank space from the beginning/end of a string?
- How do I pad a string with blanks or pad a number with zeroes?
- How do I extract selected columns from a string?
- How do I find the soundex value of a string?
- How can I expand variables in text strings?
- What's wrong with always quoting "\$vars"?
- Why don't my <<HERE documents work?
- What is the difference between a list and an array?

- What is the difference between `$array[1]` and `@array[1]`?
- How can I remove duplicate elements from a list or array?
- How can I tell whether a certain element is contained in a list or array?
- How do I compute the difference of two arrays? How do I compute the intersection of two arrays?
- How do I test whether two arrays or hashes are equal?
- How do I find the first array element for which a condition is true?
- How do I handle linked lists?
- How do I handle circular lists?
- How do I shuffle an array randomly?
- How do I process/modify each element of an array?
- How do I select a random element from an array?
- How do I permute N elements of a list?
- How do I sort an array by (anything)?
- How do I manipulate arrays of bits?
- Why does `defined()` return true on empty arrays and hashes?
- How do I process an entire hash?
- How do I merge two hashes?
- What happens if I add or remove keys from a hash while iterating over it?
- How do I look up a hash element by value?
- How can I know how many entries are in a hash?
- How do I sort a hash (optionally by value instead of key)?
- How can I always keep my hash sorted?
- What's the difference between "delete" and "undef" with hashes?
- Why don't my tied hashes make the `defined/exists` distinction?
- How do I reset an `each()` operation part-way through?
- How can I get the unique keys from two hashes?
- How can I store a multidimensional array in a DBM file?
- How can I make my hash remember the order I put elements into it?
- Why does passing a subroutine an undefined element in a hash create it?
- How can I make the Perl equivalent of a C structure/C++ class/hash or array of hashes or arrays?
- How can I use a reference as a hash key?
- How can I check if a key exists in a multilevel hash?
- How can I prevent addition of unwanted keys into a hash?

- How do I handle binary data correctly?
- How do I determine whether a scalar is a number/whole/integer/float?
- How do I keep persistent data across program calls?
- How do I print out or copy a recursive data structure?
- How do I define methods for every class/object?
- How do I verify a credit card checksum?
- How do I pack arrays of doubles or floats for XS code?

## perlfaq5: Files and Formats

This section deals with I/O and the "f" issues: filehandles, flushing, formats, and footers.

- How do I flush/unbuffer an output filehandle? Why must I do this?
- How do I change, delete, or insert a line in a file, or append to the beginning of a file?
- How do I count the number of lines in a file?
- How do I delete the last N lines from a file?
- How can I use Perl's `-i` option from within a program?
- How can I copy a file?
- How do I make a temporary file name?
- How can I manipulate fixed-record-length files?
- How can I make a filehandle local to a subroutine? How do I pass filehandles between subroutines? How do I make an array of filehandles?
- How can I use a filehandle indirectly?
- How can I set up a footer format to be used with `write()`?
- How can I `write()` into a string?
- How can I open a filehandle to a string?
- How can I output my numbers with commas added?
- How can I translate tildes (`~`) in a filename?
- How come when I open a file read-write it wipes it out?
- Why do I sometimes get an "Argument list too long" when I use `<*>`?
- How can I open a file with a leading `>` or trailing blanks?
- How can I reliably rename a file?
- How can I lock a file?
- Why can't I just `open(FH, ">file.lock")`?
- I still don't get locking. I just want to increment the number in the file. How can I do this?
- All I want to do is append a small amount of text to the end of a file. Do I still have to use locking?
- How do I randomly update a binary file?

- How do I get a file's timestamp in perl?
- How do I set a file's timestamp in perl?
- How do I print to more than one file at once?
- How can I read in an entire file all at once?
- How can I read in a file by paragraphs?
- How can I read a single character from a file? From the keyboard?
- How can I tell whether there's a character waiting on a filehandle?
- How do I do a `tail -f` in perl?
- How do I `dup()` a filehandle in Perl?
- How do I close a file descriptor by number?
- Why can't I use "C:\temp\foo" in DOS paths? Why doesn't ``C:\temp\foo.exe`` work?
- Why doesn't `glob("*.*)` get all the files?
- Why does Perl let me delete read-only files? Why does `-i` clobber protected files? Isn't this a bug in Perl?
- How do I select a random line from a file?
- Why do I get weird spaces when I print an array of lines?
- How do I traverse a directory tree?
- How do I delete a directory tree?
- How do I copy an entire directory?

## perlfaq6: Regular Expressions

This section is surprisingly small because the rest of the FAQ is littered with answers involving regular expressions. For example, decoding a URL and checking whether something is a number can be handled with regular expressions, but those answers are found elsewhere in this document (in perlfaq9 : "How do I decode or create those %-encodings on the web" and perlfaq4 : "How do I determine whether a scalar is a number/whole/integer/float", to be precise).

- How can I hope to use regular expressions without creating illegible and unmaintainable code?
- I'm having trouble matching over more than one line. What's wrong?
- How can I pull out lines between two patterns that are themselves on different lines?
- How do I match XML, HTML, or other nasty, ugly things with a regex?
- I put a regular expression into `$/` but it didn't work. What's wrong?
- How do I substitute case-insensitively on the LHS while preserving case on the RHS?
- How can I make `\w` match national character sets?
- How can I match a locale-smart version of `/[a-zA-Z]/`?
- How can I quote a variable to use in a regex?
- What is `/o` really for?

- How do I use a regular expression to strip C-style comments from a file?
- Can I use Perl regular expressions to match balanced text?
- What does it mean that regexes are greedy? How can I get around it?
- How do I process each word on each line?
- How can I print out a word-frequency or line-frequency summary?
- How can I do approximate matching?
- How do I efficiently match many regular expressions at once?
- Why don't word-boundary searches with `\b` work for me?
- Why does using `$&`, `$``, or `$'` slow my program down?
- What good is `\G` in a regular expression?
- Are Perl regexes DFAs or NFAs? Are they POSIX compliant?
- What's wrong with using `grep` in a void context?
- How can I match strings with multibyte characters?
- How do I match a regular expression that's in a variable?

### perlfaq7: General Perl Language Issues

This section deals with general Perl language issues that don't clearly fit into any of the other sections.

- Can I get a BNF/yacc/RE for the Perl language?
- What are all these `$@%&*` punctuation signs, and how do I know when to use them?
- Do I always/never have to quote my strings or use semicolons and commas?
- How do I skip some return values?
- How do I temporarily block warnings?
- What's an extension?
- Why do Perl operators have different precedence than C operators?
- How do I declare/create a structure?
- How do I create a module?
- How do I adopt or take over a module already on CPAN?
- How do I create a class?
- How can I tell if a variable is tainted?
- What's a closure?
- What is variable suicide and how can I prevent it?
- How can I pass/return a {Function, FileHandle, Array, Hash, Method, Regex}?
- How do I create a static variable?
- What's the difference between dynamic and lexical (static) scoping? Between `local()` and `my()`?



- How can I access a dynamic variable while a similarly named lexical is in scope?
- What's the difference between deep and shallow binding?
- Why doesn't "my(\$foo) = <\$fh>," work right?
- How do I redefine a builtin function, operator, or method?
- What's the difference between calling a function as &foo and foo()?
- How do I create a switch or case statement?
- How can I catch accesses to undefined variables, functions, or methods?
- Why can't a method included in this same file be found?
- How can I find out my current or calling package?
- How can I comment out a large block of Perl code?
- How do I clear a package?
- How can I use a variable as a variable name?
- What does "bad interpreter" mean?
- Do I need to recompile XS modules when there is a change in the C library?

### perlfaq8: System Interaction

This section of the Perl FAQ covers questions involving operating system interaction. Topics include interprocess communication (IPC), control over the user-interface (keyboard, screen and pointing devices), and most anything else not related to data manipulation.

- How do I find out which operating system I'm running under?
- How come exec() doesn't return?
- How do I do fancy stuff with the keyboard/screen/mouse?
- How do I print something out in color?
- How do I read just one key without waiting for a return key?
- How do I check whether input is ready on the keyboard?
- How do I clear the screen?
- How do I get the screen size?
- How do I ask the user for a password?
- How do I read and write the serial port?
- How do I decode encrypted password files?
- How do I start a process in the background?
- How do I trap control characters/signals?
- How do I modify the shadow password file on a Unix system?
- How do I set the time and date?
- How can I sleep() or alarm() for under a second?
- How can I measure time under a second?

- How can I do an `atexit()` or `setjmp()/longjmp()`? (Exception handling)
- Why doesn't my sockets program work under System V (Solaris)? What does the error message "Protocol not supported" mean?
- How can I call my system's unique C functions from Perl?
- Where do I get the include files to do `ioctl()` or `syscall()`?
- Why do `setuid` perl scripts complain about kernel problems?
- How can I open a pipe both to and from a command?
- Why can't I get the output of a command with `system()`?
- How can I capture `STDERR` from an external command?
- Why doesn't `open()` return an error when a pipe open fails?
- What's wrong with using backticks in a void context?
- How can I call backticks without shell processing?
- Why can't my script read from `STDIN` after I gave it EOF (^D on Unix, ^Z on MS-DOS)?
- How can I convert my shell script to perl?
- Can I use perl to run a telnet or ftp session?
- How can I write `expect` in Perl?
- Is there a way to hide perl's command line from programs such as "ps"?
- I {changed directory, modified my environment} in a perl script. How come the change disappeared when I exited the script? How do I get my changes to be visible?
- How do I close a process's filehandle without waiting for it to complete?
- How do I fork a daemon process?
- How do I find out if I'm running interactively or not?
- How do I timeout a slow event?
- How do I set CPU limits?
- How do I avoid zombies on a Unix system?
- How do I use an SQL database?
- How do I make a `system()` exit on control-C?
- How do I open a file without blocking?
- How do I tell the difference between errors from the shell and perl?
- How do I install a module from CPAN?
- What's the difference between `require` and `use`?
- How do I keep my own module/library directory?
- How do I add the directory my program lives in to the module/library search path?
- How do I add a directory to my include path (@INC) at runtime?
- Where are modules installed?

- What is socket.ph and where do I get it?

## perlfaq9: Web, Email and Networking

This section deals with questions related to running web sites, sending and receiving email as well as general networking.

- Should I use a web framework?
- Which web framework should I use?
- What is Plack and PSGI?
- How do I remove HTML from a string?
- How do I extract URLs?
- How do I fetch an HTML file?
- How do I automate an HTML form submission?
- How do I decode or create those %-encodings on the web?
- How do I redirect to another page?
- How do I put a password on my web pages?
- How do I make sure users can't enter values into a form that causes my CGI script to do bad things?
- How do I parse a mail header?
- How do I check a valid mail address?
- How do I decode a MIME/BASE64 string?
- How do I find the user's mail address?
- How do I send email?
- How do I use MIME to make an attachment to a mail message?
- How do I read email?
- How do I find out my hostname, domainname, or IP address?
- How do I fetch/put an (S)FTP file?
- How can I do RPC in Perl?

## CREDITS

Tom Christiansen wrote the original perlfaq then expanded it with the help of Nat Torkington. brian d foy substantially edited and expanded the perlfaq. perlfaq-workers and others have also supplied feedback, patches and corrections over the years.

## AUTHOR AND COPYRIGHT

Tom Christiansen wrote the original version of this document. brian d foy <bdfoy@cpan.org> wrote this version. See the individual perlfaq documents for additional copyright information.

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