print in perl doesn't include what?

A newline character.

List the variable type syntax.

- \$ scalar@ array
- % hash
- & subroutine
- * typeglob

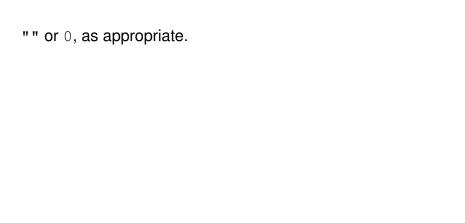
What's the difference between double, single quotes, and back ticks?

Double quotes perform variable interpolation and backslash

interpretation. Single quotes do not.

Back ticks capture the output from executing a command.

What are the default values?



How are scalar values interpreted?

As the expected type, depending on context.

What context do double quotes provide?

Assignment to arrays/hashes?

interpolative context

list context

Create a list using literal syntax.

Unpack that list.

```
@threeprimes = (2, 3, 5);
($a, $b, $c) = @threeprimes;
```

Index an array.

Update an array.

Either involves a scalar so use \$ not @.

```
$1st[n] = new_el
print $1st[n]
```

Create a hash using literal syntax.

```
@birthmonths = (
    "John" => "February",
    "Mary" => "March",
);
```

Arrows are just a nicer way of writing more arrows.

Look up an element in a hash.

Update a hash.

```
$hash{"key"}
$hash{"key"} = val
```

As with arrays, notice the use of \$ when dealing with individual elements.

Describe the Perl noun/verb analogy.

Nouns can be singular (scalars) or plural (arrays and hashes). Verbs can be procedures or functions.

Run some perl straight from the terminal.

Run some perl stored in a file.

Get interpreter warnings.

perl -e 'some perl'
perl file.pl

The -w option prints warnings.

What is a filehandle?

Which are built in?

A data type that can represent files, devices, sockets, and pipes.

STDOUT and STDERR are provided by default.

Get a filehandle.

Use open, whose simplest form is:

open(HANDLENAME, "filename");

What read/write options are available when requesting a new filehandle?

Readonly (default): "<filename"
Write (clobber): ">filename"
Write (append): ">>filename"

What is a common idiom for handling failure when opening a file?

open(FILEHANDLE, "file") or die "Error opening file: $\$!\n";

\$! is the OS's error message.

Read a line from a file.

Read a line from the terminal.

```
$str = <FILEHANDLE>
$str = <STDIN>
```

Write to a file.

Write to the terminal.

print FILEHANDLE 'str'

These two are the same:

print STDOUT 'str'
print 'str'

What's the difference between chop and chomp?

chop removes the last character of the string passed to it, and returns it.

chomp removes endl from the string passed to it, and returns the *number* of characters removed.

What is Perl's string concatenation operator?

Why does Perl have separate operators for string concatenation and arithmetic addition?

Use a period (.) for string concatenation.

sum.

Because of weak typing addition of scalars created as strings, but that can be interpreted as numbers, would result in a

How can you achieve Python's "string multiplication"?

Use the repeat operator (x).

Name three ways to print a formatted string.

- Using the dot operator (like idiomatic Java using +)
- Using interpolation (like idiomatic bash using \$)

- Using list literal syntax

What is the exponentiation operator?

* *

Operators ending with = are treated ...

... specially.

In general, the following two are equivalent: lval op= expr

lval = lval op expr

What is the result of assignment?



The auto-incrementing/decrementing operators are just as in ...



What are the two sets of boolean operators?

What's the difference?

||-or !-not

&& - and

The English ones bind less tightly.

What are the standard comparison operators?

What non-standard one is provided?

There are numeric and string versions.

- == eq != - ne
- < 1t.
- > **-** gt
- <= le
- >= de

Nonstandard, but handy:

<=> - cmp

Name the common file test operators.

```
-e (exists)
-r (readable)
−w (writable)
−d (directory)
```

-f (regular file

-T (text file)

What values are truthy?

Any string except "" and "0". Any number except 0.

Why are references truthy and undefined values falsy?

References evaluate to non-0 addresses.

Undefined values evaluate to 0 or "".

In idiomatic Perl, simple conditionals are achieved with ...

... booleans operators.

Give the syntax of conditionals.

```
if (cond1) {
   #block1
elsif (cond2) {
  #block2
else {
  #blocknN
Braces are always required.
```

What's the idiomatic way to accomplish the "if not" control flow?

unless (cond) {
 #block
}

What are the four looping constructions?

- -while -until -for
- foreach

while's cousin is ...

... unless which executes the block as long as the condition is falsy.

Give the canonical for-loop iteration construction in Perl.

```
for (\$i = 0; \$i < num; \$i++) {
    #body
```

Describe the foreach construction.

What's the huge surprise?

```
foreach $el (@arr) {
    #body
}
```

\$el is by reference, not value, so you can in fact mutate @arr by re-assigning \$el.

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Perl doesn't have break/continue, but has what?

next, last, and redo.

next is just like continue. last is just like break. redo executes the same iteration again. next/last can optionally specify what?

Block labels, identifying which enclosing looping construction is being referred to.

If an operator can produce either a list or a scalar, which will be returned?

It depends on context. List context can be provided various ways, including by assigning to a list or by an operator that provides the LIST context to its arguments.