| bars make cores

|_ `spec alas (map term tome)`
produces a door (a core with sample)

|% `(unit term) (map term tome)`
produces a core (battery and payload)

|@ `(unit term) (map term tome)`
produces a wet core (battery and payload)

|. hoon
produces a trap (a core with one arm)

|: `[hoon hoon]`
produces a gate with a custom sample

|- `hoon`
produces a trap (a core with one arm) and evaluates it

|^ `hoon (map term tome)`
produces a core whose battery includes a `$` arm and computes the latter

|~ `[spec value]`
produces an iron gate

|* `[spec value]`
produces a wet gate (a one-armed core with sample)

|= `[spec value]`
produces a dry gate (a one-armed core with sample)

|? `hoon`
produces a lead trap

|$ `(lest term) spec`
produces a mold

$ bucs form molds

$@ `[spec spec]`
structure that normalizes a union tagged by head atom

$: `(list spec)`
forms a cell type (tuple) `[a=foo b=bar c=baz]`

$_ `hoon`
structure that normalizes to an example `_foo`

$% `(list spec)`
structure that recognizes a union tagged by head atom

$* `hoon`
bunt (irregular form is `*`)

$^ `hoon`
structure that normalizes a union tagged by head depth (cell)

$~ `[hoon spec]`
defines a custom type default value

$- `[spec spec]`
structure that normalizes to an example gate

$= `[skin spec]`
structure that wraps a face around another structure `foo=bar`

$? `(list spec)`
forms a type from a union of other types `?($foo $bar $baz)`

$> `[spec spec]`
structure from filter (requiring)

$< `[spec spec]`
structure from filter (excluding)

$$ `[spec (map term spec)]`
structure from recursion

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$| `[spec hoon]`
structure with verification
$. `[spec (map term spec)]`
structure as read–write core
$+ `[stud spec]`
standard structure
$; `hoon`
manual structure
$/ `[spec (map term spec)]`
structure as write-only core
**$`** `[spec (map term spec)]`
structure as read-only core
$& `[spec hoon]`
repaired structure
$! `[spec (map term spec)]`
structure as opaque core

% **cens put the fun in function**

%_ `[wing (list (pair wing hoon))]`
resolves a wing with changes, preserving type
%. `[hoon hoon]`
calls a gate, inverted
%^ `[hoon hoon hoon hoon]`
calls a gate with triple sample
%+ `[hoon hoon hoon]`
calls a gate with a cell sample
%- `[hoon hoon]`
calls a gate `(fun arg)`
%: `[hoon (list hoon)]`
calls a gate with many arguments
%~ `[wing hoon hoon]`
evaluates an arm in a door `~(arm core arg)`
%* `[wing hoon (list (pair winghoon))]`
evaluates an expression, then resolves a wing with changes
%= `[wing (list (pair wing hoon))]`
resolves a wing with changes `foo(x 1, y 2, z 3)`

: **cols make cells**

:_ `[hoon hoon]`
constructs a cell, inverted
:^ `[hoon hoon hoon hoon]`
constructs a cell, 4-tuple `[a b c d]`
:+ `[hoon hoon hoon]`
constructs a cell, 3-tuple `[a b c]`
:- `[hoon hoon]`
constructs a cell, 2-tuple `[a b]`, `a^b`
:~ `(list hoon)`
constructs a null-terminated list `~[a b c]`
:* `(list hoon)`
constructs an n-tuple `[a b c d e …]`
::
marks a comment

. dots nock

.+ `atom`
increments an atom using Nock 4 `+(42)`

.* `[hoon hoon]`
evaluates using Nock 2

.= `[hoon hoon]`
tests for equality using Nock 5 `=(a b)`

.? `hoon`
tests for cell or atom using Nock 3

.^ `[spec hoon]`
loads from namespace using Nock 12

^ kets cast

^| `hoon`
converts a gold core to an iron core (invariant)

^. `[hoon hoon]`
typecasts on value

^- `[spec hoon]`
typecasts by explicit type label `` `foo`bar ``

^+ `[hoon hoon]`
typecasts by inferred type

^& `hoon`
converts a core to a zinc core (covariant)

^~ `hoon`
folds constant at compile time

^= `[skin hoon]`
binds name to a value `foo=bar`

^? `hoon`
converts a core to a lead core (bivariant)

^* `spec`
produces example type value

^: `spec`
produces a ‘factory’ gate for a type

~ sigs hint

~| `[hoon hoon]`
prints in stack trace if failure

~$ `[term hoon]`
profiler hit counter

~_ `[hoon hoon]`
prints in stack trace, user-formatted

~% `[chum hoon tyre hoon]`
registers jet

~/ `[chum hoon]`
registers jet with registered context

~< `[$@(term [term hoon]) hoon]`
raw hint, applied to product (“backward”)

~> `[$@(term [term hoon]) hoon]`
raw hint, applied to computation (“forward”)

~+ `[@ hoon]`
caches a computation

~& `[@ud hoon hoon]`
prints (used for debugging)

~? `[@ud hoon hoon hoon]`
prints conditionally (used for debugging)

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~= `[hoon hoon]`
detects duplicate
~! `[hoon hoon]`
prints type if compilation failure

; mics make

;: `[hoon (list hoon)]`
calls a binary function as an n-ary function
`:(fun a b c d)`
;< `[spec hoon hoon hoon]`
glues a pipeline together (monadic bind)
;~ `[hoon (list hoon)]`
glues a pipeline together with a product-sample adapter (monadic bind)
;; `[spec hoon]`
normalizes with a mold, asserting fixpoint
;+
(Sail) makes a single XML node
;*
(Sail) makes a list of XML nodes from Hoon expression
;= `marl:hoot`
(Sail) makes a list of XML nodes
;/ `hoon`
(Sail) yields tape as XML element

= tises alter

=| `[spec hoon]`
combines default type value with the subject
=. `[wing hoon hoon]`
changes one leg in the subject
=? `[wing hoon hoon hoon]`
changes one leg in the subject conditionally
=^ `[skin wing hoon hoon]`
pins the head of a pair; changes a leg with the tail
=: `[(list (pair wing hoon)) hoon]`
changes multiple legs in the subject
=/ `[skin hoon hoon]`
combines a named noun with the subject
=; `[skin hoon hoon]`
combines a named noun with the subject, inverted
=< `[hoon hoon]`
composes two expressions, inverted
`foo:bar`
=> `[hoon hoon]`
composes two expressions
=- `[hoon hoon]`
combines a new noun with the subject
=* `[(pair term (unit spec)) hoon hoon]`
defines an alias
=, `[hoon hoon]`
exposes namespace
=+ `[hoon hoon]`
combines a new noun with the subject
=~ `(list hoon)`
composes many expressions

? **wuts test**

?| `(list hoon)`
logical OR (loobean) `|(foo bar baz)`

?: `[hoon hoon hoon]`
branches on a boolean test

?. `[hoon hoon hoon]`
branches on a boolean test, inverted

?< `[hoon hoon]`
negative assertion

?> `[hoon hoo]`
positive assertion

?- `[wing (list (pair spec hoon))]`
switches against a union, no default

?^ `[wing hoon hoon]`
branches on whether a wing of the subject is a cell

?= `[spec wing]`
tests pattern match

?# `[skin wing]`
tests pattern match

?+ `[wing hoon (list (pair spec hoon))]`
switches against a union, with default

?& `(list hoon)`
logical AND (loobean) `&(foo bar baz)`

?@ `[wing hoon hoon]`
branches on whether a wing of the subject is an atom

?~ `[wing hoon hoon]`
branches on whether a wing of the subject is null

?! `hoon`
logical NOT (loobean) `!foo`

! **zaps wild**

!:
turns on stack trace

!.
turns off stack trace

!, `[hoon hoon]`
emits AST of expression

!; `[hoon hoon]`
emits the type for an expression using the type of type

!> `hoon`
wraps a noun in its type

!= `hoon`
makes the Nock formula for a Hoon expression

!? `[$@(@ {@ @}) hoon]`
restricts Hoon version

!! `~`
crashes

!< `hoon`
lift dynamic value into static context

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/ fases ford
/$ slams a gate on extra arguments
/| takes a series of horns and produces the first one (L-to-R) that succeeds; if none succeed, produces stack traces from arguments
/= runs a horn (usually produced by another Ford rune), takes the result of that horn, and wraps a face around it
/. produces a null-terminated list from a sequence of horns, terminated by ==
/, acts as switch statement, picking a branch to evaluate based on whether the current path matches the path in the switch statement
/& pass a horn through multiple marks
/_ *unfiltered*: takes a horn, producing new horn mapping supplied horn over list of files in current directory; *filtered*: runs a horn on each file matching aura
/~ produces a horn that evaluates a twig and places the product in the subject
/: takes a path and a horn, and evaluates the horn with the current path set to the supplied path
/^ takes a mold and a horn, and casts the result of the horn to the mold
/! produces a mark
/+ accepts a filename and loads that filename from the `lib` directory
/- accepts a filename and loads that filename from the `sur` directory
// parses relative path as a hoon twig, and adds the resulting twig to the subject
/; takes a twig and a horn; the twig should evaluate to a gate, which is then slammed with the result of the horn as its sample
/# takes a horn and produces a cell of the dependency hash of the result of the horn, and the result itself
/% forwards extra arguments to enclosed renderers
-/= terminators terminate
-- terminates core expression
== terminates running series of Hoon expressions
+ luses change
+| labels a chapter
+$ produces a structure arm (type definition)
++ produces a (normal) arm
+* produces a type constructor arm

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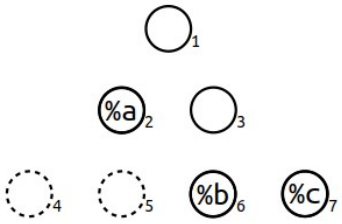
syntax

`+1:[%a [%b %c]]  [%a [%b %c]]`	`[%a [%b %c]]`	`.:[%a [%b %c]]  [%a [%b %c]]`
`+2:[%a [%b %c]]  %a`		`-:[%a [%b %c]]  %a`
`+3:[%a [%b %c]]  [%b %c]`		`+:[%a [%b %c]]  [%b %c]`
`+4:[%a [%b %c]]  %ride failed`		`-<:[%a [%b %c]]  %ride failed`
`+6:[%a [%b %c]]  %b`		`+<:[%a [%b %c]]  %b`
`+7:[%a [%b %c]]  %c`		`+>:[%a [%b %c]]  %c`



`.`	current subject
`+`	`+:.`
`-`	`-:.`
`+>`	`+>:.`

`^face`	face in outer core
`..arm`	core in which `++arm` is defined

	`~` 0 (nil)	`eny` entropy	`` `a [~ a] ``
`%.y`	`&` yes/true	`now` current time	`~[a b c] [a b c ~]`
`%.n`	`|` no/false		`[a b c]~ [[a b c] ~]`

`<[1 2 3]>`	renders list as a tape
`>[1 2 3]<`	renders list as a tank

```
?=($hoon %hoon) %.y
?=($hoon %loon) %.n
```

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@p notation

`@c`	Unicode codepoints	`~-~45fed.`
`@d`	Date	
`@da`	Date, absolute	`~2020.12.25..7.15.0..1ef5`
`@dr`	Date, relative	`~d71.h19.m26.s24..9d55`
`@n`	Nil	
`@p`	Phonemic base	`~laszod-dozser-fosrum-fanbyr`
`@r`	IEEE-754 floating-point number	
`@rh`	Floating-point number, half-precision, 16-bit	`.~~3.14`
`@rs`	Floating-point number, single-precision, 32-bit	`.3.141592653589793`
`@rd`	Floating-point number, double-precision, 64-bit	`.~3.141592653589793`
`@rq`	Floating-point number, quadruple-precision, 128-bit	`.~~~3.141592653589793`
`@s`	Integer, signed (sign bit low)	
`@sb`	Signed binary	`--0b10.0000`
`@sd`	Signed decimal	`--1.000`
`@sv`	Signed base-32	`--0v201.4gvml.245kc`
`@sw`	Signed base-64	`--0w2.04AfS.G8xqc`
`@sx`	Signed hexadecimal	`--0x2004.90fd`
`@t`	UTF-8 text (cord)	`"urbit"`
`@ta`	ASCII text (knot)	`~.urbit`
`@tas`	ASCII text symbol (term)	`%urbit`
`@u`	Integer, unsigned	
`@ub`	Unsigned binary	`0b10.1011`
`@ud`	Unsigned decimal	`8.675.309`
`@uv`	Unsigned base-32	`0v88nvd`
`@uw`	Unsigned base-64	`0wx5~J`
`@ux`	Unsigned hexadecimal	`0x84.5fed`

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