

# HTML: Parsing Library

Version 7.7

May 1, 2020

```
(require html)      package: html-lib
```

The `html` library provides functions to read conformant HTML4 documents and structures to represent them. Since `html` assumes documents are conformant and is restricted to the older specific, it should be viewed as a legacy library. We suggest using the `html-parsing` package for modern Web scraping.

```
(read-xhtml port) → html?  
  port : input-port?  
(read-html port) → html?  
  port : input-port?
```

Reads (X)HTML from a port, producing an `html` instance.

```
(read-html-as-xml port) → (listof content/c)  
  port : input-port?
```

Reads HTML from a port, producing a list of XML content, each of which could be turned into an X-expression, if necessary, with `xml->xexpr`.

```
(read-html-comments) → boolean?  
(read-html-comments v) → void?  
  v : any/c
```

If `v` is not `#f`, then comments are read and returned. Defaults to `#f`.

```
(use-html-spec) → boolean?  
(use-html-spec v) → void?  
  v : any/c
```

If `v` is not `#f`, then the HTML must respect the HTML specification with regards to what elements are allowed to be the children of other elements. For example, the top-level "`<html>`" element may only contain a "`<body>`" and "`<head>`" element. Defaults to `#t`.

# 1 Example

```
(module html-example racket

; Some of the symbols in html and xml conflict with
; each other and with racket/base language, so we prefix
; to avoid namespace conflict.
(require (prefix-in h: html)
         (prefix-in x: xml))

(define an-html
  (h:read-xhtml
   (open-input-string
    (string-append
     "<html><head><title>My title</title></head><body>"
     "<p>Hello world</p><p><b>Testing</b>!</p>"
     "</body></html>"))))

; extract-pcdata: html-content/c -> (listof string)
; Pulls out the pcdata strings from some-content.
(define (extract-pcdata some-content)
  (cond [(x:pcdata? some-content)
         (list (x:pcdata-string some-content))]
        [(x:entity? some-content)
         (list)]
        [else
         (extract-pcdata-from-element some-content)]))

; extract-pcdata-from-element: html-element -> (listof string)
; Pulls out the pcdata strings from an-html-element.
(define (extract-pcdata-from-element an-html-element)
  (match an-html-element
    [(struct h:html-full (attributes content))
     (apply append (map extract-pcdata content))]

    [(struct h:html-element (attributes))
     '()])))

(printf "~s\n" (extract-pcdata an-html))

> (require 'html-example)
("My title" "Hello world" "Testing" "!")
```

## 2 HTML Structures

`pcdata`, `entity`, and `attribute` are defined in the `xml` documentation.

`html-content/c` : contract?

A `html-content/c` is either

- `html-element`
- `pcdata`
- `entity`

```
(struct html-element (attributes)
  #:extra-constructor-name make-html-element)
attributes : (listof attribute)
```

Any of the structures below inherits from `html-element`.

```
(struct html-full struct:html-element (content)
  #:extra-constructor-name make-html-full)
content : (listof html-content/c)
```

Any html tag that may include content also inherits from `html-full` without adding any additional fields.

```
(struct mzscheme html-full ()
  #:extra-constructor-name make-mzscheme)
```

A `mzscheme` is special legacy value for the old documentation system.

```
(struct html html-full ()
  #:extra-constructor-name make-html)
```

A `html` is `(make-html (listof attribute) (listof Contents-of-html))`

A `Contents-of-html` is either

- `body`
- `head`

```
(struct div html-full ()
  #:extra-constructor-name make-div)
```

A div is (make-div (listof attribute) (listof G2))

```
(struct center html-full ()
  #:extra-constructor-name make-center)
```

A center is (make-center (listof attribute) (listof G2))

```
(struct blockquote html-full ()
  #:extra-constructor-name make-blockquote)
```

A blockquote is (make-blockquote (listof attribute) (listof G2))

```
(struct ins html-full ()
  #:extra-constructor-name make-ins)
```

An Ins is (make-ins (listof attribute) (listof G2))

```
(struct del html-full ()
  #:extra-constructor-name make-del)
```

A del is (make-del (listof attribute) (listof G2))

```
(struct dd html-full ()
  #:extra-constructor-name make-dd)
```

A dd is (make-dd (listof attribute) (listof G2))

```
(struct li html-full ()
  #:extra-constructor-name make-li)
```

A li is (make-li (listof attribute) (listof G2))

```
(struct th html-full ()
  #:extra-constructor-name make-th)
```

A th is (make-th (listof attribute) (listof G2))

```
(struct td html-full ()
  #:extra-constructor-name make-td)
```

A td is (make-td (listof attribute) (listof G2))

```
(struct iframe html-full ()
 #:extra-constructor-name make-iframe)
```

An `iframe` is `(make-iframe (listof attribute) (listof G2))`

```
(struct noframes html-full ()
 #:extra-constructor-name make-noframes)
```

A `noframes` is `(make-noframes (listof attribute) (listof G2))`

```
(struct noscript html-full ()
 #:extra-constructor-name make-noscript)
```

A `noscript` is `(make-noscript (listof attribute) (listof G2))`

```
(struct style html-full ()
 #:extra-constructor-name make-style)
```

A `style` is `(make-style (listof attribute) (listof pcdatalist))`

```
(struct script html-full ()
 #:extra-constructor-name make-script)
```

A `script` is `(make-script (listof attribute) (listof pcdatalist))`

```
(struct basefont html-element ()
 #:extra-constructor-name make-basefont)
```

A `basefont` is `(make-basefont (listof attribute))`

```
(struct br html-element ()
 #:extra-constructor-name make-br)
```

A `br` is `(make-br (listof attribute))`

```
(struct area html-element ()
 #:extra-constructor-name make-area)
```

An `area` is `(make-area (listof attribute))`

```
(struct alink html-element ()
 #:extra-constructor-name make-alink)
```

A `alink` is `(make-alink (listof attribute))`

```
(struct img html-element ()
  #:extra-constructor-name make-img)
```

An `img` is `(make-img (listof attribute))`

```
(struct param html-element ()
  #:extra-constructor-name make-param)
```

A `param` is `(make-param (listof attribute))`

```
(struct hr html-element ()
  #:extra-constructor-name make-hr)
```

A `hr` is `(make-hr (listof attribute))`

```
(struct input html-element ()
  #:extra-constructor-name make-input)
```

An `input` is `(make-input (listof attribute))`

```
(struct col html-element ()
  #:extra-constructor-name make-col)
```

A `col` is `(make-col (listof attribute))`

```
(struct isindex html-element ()
  #:extra-constructor-name make-isindex)
```

An `isindex` is `(make-isindex (listof attribute))`

```
(struct base html-element ()
  #:extra-constructor-name make-base)
```

A `base` is `(make-base (listof attribute))`

```
(struct meta html-element ()
  #:extra-constructor-name make-meta)
```

A `meta` is `(make-meta (listof attribute))`

```
(struct option html-full ()
  #:extra-constructor-name make-option)
```

An `option` is `(make-option (listof attribute) (listof pcddata))`

```
(struct textarea html-full ()
  #:extra-constructor-name make-textarea)
```

A `textarea` is `(make-textarea (listof attribute) (listof pcdata))`

```
(struct title html-full ()
  #:extra-constructor-name make-title)
```

A `title` is `(make-title (listof attribute) (listof pcdata))`

```
(struct head html-full ()
  #:extra-constructor-name make-head)
```

A `head` is `(make-head (listof attribute) (listof Contents-of-head))`

A `Contents-of-head` is either

- `base`
- `isindex`
- `alink`
- `meta`
- `object`
- `script`
- `style`
- `title`

```
(struct tr html-full ()
  #:extra-constructor-name make-tr)
```

A `tr` is `(make-tr (listof attribute) (listof Contents-of-tr))`

A `Contents-of-tr` is either

- `td`
- `th`

```
(struct colgroup html-full ()
  #:extra-constructor-name make-colgroup)
```

A `colgroup` is `(make-colgroup (listof attribute) (listof col))`

```
(struct thead html-full ()
  #:extra-constructor-name make-thead)
```

A `thead` is `(make-thead (listof attribute) (listof tr))`

```
(struct tfoot html-full ()
  #:extra-constructor-name make-tfoot)
```

A `tfoot` is `(make-tfoot (listof attribute) (listof tr))`

```
(struct tbody html-full ()
  #:extra-constructor-name make-tbody)
```

A `tbody` is `(make-tbody (listof attribute) (listof tr))`

```
(struct tt html-full ()
  #:extra-constructor-name make-tt)
```

A `tt` is `(make-tt (listof attribute) (listof G5))`

```
(struct i html-full ()
  #:extra-constructor-name make-i)
```

An `i` is `(make-i (listof attribute) (listof G5))`

```
(struct b html-full ()
  #:extra-constructor-name make-b)
```

A `b` is `(make-b (listof attribute) (listof G5))`

```
(struct u html-full ()
  #:extra-constructor-name make-u)
```

An `u` is `(make-u (listof attribute) (listof G5))`

```
(struct s html-full ()
  #:extra-constructor-name make-s)
```

A `s` is `(make-s (listof attribute) (listof G5))`

```
(struct strike html-full ()
  #:extra-constructor-name make-strike)
```



A `strike` is `(make-strike (listof attribute) (listof G5))`

```
(struct big html-full ()  
  #:extra-constructor-name make-big)
```

A `big` is `(make-big (listof attribute) (listof G5))`

```
(struct small html-full ()  
  #:extra-constructor-name make-small)
```

A `small` is `(make-small (listof attribute) (listof G5))`

```
(struct em html-full ()  
  #:extra-constructor-name make-em)
```

An `em` is `(make-em (listof attribute) (listof G5))`

```
(struct strong html-full ()  
  #:extra-constructor-name make-strong)
```

A `strong` is `(make-strong (listof attribute) (listof G5))`

```
(struct dfn html-full ()  
  #:extra-constructor-name make-dfn)
```

A `dfn` is `(make-dfn (listof attribute) (listof G5))`

```
(struct code html-full ()  
  #:extra-constructor-name make-code)
```

A `code` is `(make-code (listof attribute) (listof G5))`

```
(struct samp html-full ()  
  #:extra-constructor-name make-samp)
```

A `samp` is `(make-samp (listof attribute) (listof G5))`

```
(struct kbd html-full ()  
  #:extra-constructor-name make-kbd)
```

A `kbd` is `(make-kbd (listof attribute) (listof G5))`

```
(struct var html-full ()  
  #:extra-constructor-name make-var)
```

A `var` is `(make-var (listof attribute) (listof G5))`

```
(struct cite html-full ()  
  #:extra-constructor-name make-cite)
```

A `cite` is `(make-cite (listof attribute) (listof G5))`

```
(struct abbr html-full ()  
  #:extra-constructor-name make-abbr)
```

An `abbr` is `(make-abbr (listof attribute) (listof G5))`

```
(struct acronym html-full ()  
  #:extra-constructor-name make-acronym)
```

An `acronym` is `(make-acronym (listof attribute) (listof G5))`

```
(struct sub html-full ()  
  #:extra-constructor-name make-sub)
```

A `sub` is `(make-sub (listof attribute) (listof G5))`

```
(struct sup html-full ()  
  #:extra-constructor-name make-sup)
```

A `sup` is `(make-sup (listof attribute) (listof G5))`

```
(struct span html-full ()  
  #:extra-constructor-name make-span)
```

A `span` is `(make-span (listof attribute) (listof G5))`

```
(struct bdo html-full ()  
  #:extra-constructor-name make-bdo)
```

A `bdo` is `(make-bdo (listof attribute) (listof G5))`

```
(struct font html-full ()  
  #:extra-constructor-name make-font)
```

A `font` is `(make-font (listof attribute) (listof G5))`

```
(struct p html-full ()  
  #:extra-constructor-name make-p)
```

A `p` is `(make-p (listof attribute) (listof G5))`

```
(struct h1 html-full ()  
  #:extra-constructor-name make-h1)
```

A `h1` is `(make-h1 (listof attribute) (listof G5))`

```
(struct h2 html-full ()  
  #:extra-constructor-name make-h2)
```

A `h2` is `(make-h2 (listof attribute) (listof G5))`

```
(struct h3 html-full ()  
  #:extra-constructor-name make-h3)
```

A `h3` is `(make-h3 (listof attribute) (listof G5))`

```
(struct h4 html-full ()  
  #:extra-constructor-name make-h4)
```

A `h4` is `(make-h4 (listof attribute) (listof G5))`

```
(struct h5 html-full ()  
  #:extra-constructor-name make-h5)
```

A `h5` is `(make-h5 (listof attribute) (listof G5))`

```
(struct h6 html-full ()  
  #:extra-constructor-name make-h6)
```

A `h6` is `(make-h6 (listof attribute) (listof G5))`

```
(struct q html-full ()  
  #:extra-constructor-name make-q)
```

A `q` is `(make-q (listof attribute) (listof G5))`

```
(struct dt html-full ()  
  #:extra-constructor-name make-dt)
```

A `dt` is `(make-dt (listof attribute) (listof G5))`

```
(struct legend html-full ()  
  #:extra-constructor-name make-legend)
```

A `legend` is `(make-legend (listof attribute) (listof G5))`

```
(struct caption html-full ()  
  #:extra-constructor-name make-caption)
```

A `caption` is `(make-caption (listof attribute) (listof G5))`

```
(struct table html-full ()  
  #:extra-constructor-name make-table)
```

A `table` is `(make-table (listof attribute) (listof Contents-of-table))`

A `Contents-of-table` is either

- `caption`
- `col`
- `colgroup`
- `tbody`
- `tfoot`
- `thead`

```
(struct button html-full ()  
  #:extra-constructor-name make-button)
```

A `button` is `(make-button (listof attribute) (listof G4))`

```
(struct fieldset html-full ()  
  #:extra-constructor-name make-fieldset)
```

A `fieldset` is `(make-fieldset (listof attribute) (listof Contents-of-fieldset))`

A `Contents-of-fieldset` is either

- `legend`
- `G2`

```
(struct optgroup html-full ()  
  #:extra-constructor-name make-optgroup)
```

An `optgroup` is `(make-optgroup (listof attribute) (listof option))`

```
(struct select html-full ()  
  #:extra-constructor-name make-select)
```

A `select` is `(make-select (listof attribute) (listof Contents-of-select))`

A `Contents-of-select` is either

- `optgroup`
- `option`

```
(struct label html-full ()  
  #:extra-constructor-name make-label)
```

A `label` is `(make-label (listof attribute) (listof G6))`

```
(struct form html-full ()  
  #:extra-constructor-name make-form)
```

A `form` is `(make-form (listof attribute) (listof G3))`

```
(struct ol html-full ()  
  #:extra-constructor-name make-ol)
```

An `ol` is `(make-ol (listof attribute) (listof li))`

```
(struct ul html-full ()  
  #:extra-constructor-name make-ul)
```

An `ul` is `(make-ul (listof attribute) (listof li))`

```
(struct dir html-full ()  
  #:extra-constructor-name make-dir)
```

A `dir` is `(make-dir (listof attribute) (listof li))`

```
(struct menu html-full ()  
  #:extra-constructor-name make-menu)
```

A `menu` is `(make-menu (listof attribute) (listof li))`

```
(struct dl html-full ()  
  #:extra-constructor-name make-dl)
```

A `dl` is `(make-dl (listof attribute) (listof Contents-of-dl))`

A `Contents-of-dl` is either

- `dd`
- `dt`

```
(struct pre html-full ()  
  #:extra-constructor-name make-pre)
```

A `pre` is `(make-pre (listof attribute) (listof Contents-of-pre))`

A `Contents-of-pre` is either

- `G9`
- `G11`

```
(struct object html-full ()  
  #:extra-constructor-name make-object)
```

An `object` is `(make-object (listof attribute) (listof Contents-of-object-applet))`

```
(struct applet html-full ()  
  #:extra-constructor-name make-applet)
```

An `applet` is `(make-applet (listof attribute) (listof Contents-of-object-applet))`

A `Contents-of-object-applet` is either

- `param`
- `G2`

```
(struct -map html-full ()  
  #:extra-constructor-name make--map)
```

A `Map` is `(make--map (listof attribute) (listof Contents-of-map))`

A `Contents-of-map` is either

- `area`
- `fieldset`
- `form`
- `isindex`
- G10

```
(struct a html-full ()
  #:extra-constructor-name make-a)
```

An `a` is `(make-a (listof attribute) (listof Contents-of-a))`

A `Contents-of-a` is either

- `label`
- G7

```
(struct address html-full ()
  #:extra-constructor-name make-address)
```

An `address` is `(make-address (listof attribute) (listof Contents-of-address))`

A `Contents-of-address` is either

- `p`
- G5

```
(struct body html-full ()
  #:extra-constructor-name make-body)
```

A `body` is `(make-body (listof attribute) (listof Contents-of-body))`

A `Contents-of-body` is either

- `del`
- `ins`
- G2

A G12 is either

- `button`
- `iframe`
- `input`
- `select`
- `textarea`

A G11 is either

- `a`
- `label`
- `G12`

A G10 is either

- `address`
- `blockquote`
- `center`
- `dir`
- `div`
- `dl`
- `h1`
- `h2`
- `h3`
- `h4`
- `h5`
- `h6`
- `hr`
- `menu`
- `noframes`



- `noscript`
- `ol`
- `p`
- `pre`
- `table`
- `ul`

A G9 is either

- `abbr`
- `acronym`
- `b`
- `bdo`
- `br`
- `cite`
- `code`
- `dfn`
- `em`
- `i`
- `kbd`
- `-map`
- `pcdata`
- `q`
- `s`
- `samp`
- `script`
- `span`
- `strike`
- `strong`

- `tt`
- `u`
- `var`

A G8 is either

- `applet`
- `basefont`
- `big`
- `font`
- `img`
- `object`
- `small`
- `sub`
- `sup`
- G9

A G7 is either

- G8
- G12

A G6 is either

- `a`
- G7

A G5 is either

- `label`
- G6

A G4 is either

- G8
- G10

A G3 is either

- `fieldset`
- `isindex`
- G4
- G11

A G2 is either

- `form`
- G3