

Package: treesitter (via r-universe)

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Title Bindings to 'Tree-Sitter'

Version 0.1.0

Description Provides bindings to 'Tree-sitter', an incremental parsing system for programming tools. 'Tree-sitter' builds concrete syntax trees for source files of any language, and can efficiently update those syntax trees as the source file is edited. It also includes a robust error recovery system that provides useful parse results even in the presence of syntax errors.

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URL <https://github.com/DavisVaughan/r-tree-sitter>

BugReports <https://github.com/DavisVaughan/r-tree-sitter/issues>

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is_language *Is x a language?*

Description

Use `is_language()` to determine if an object has a class of "tree_sitter_language".

Usage

```
is_language(x)
```

Arguments

x	[object] An object.
---	------------------------

Value

- TRUE if x is a "tree_sitter_language".
- FALSE otherwise.

Examples

```
language <- treesitter.r::language()
is_language(language)
```

is_node *Is x a node?*

Description

Checks if x is a tree_sitter_node or not.

Usage

```
is_node(x)
```

Arguments

x	[object] An object.
---	------------------------

Value

TRUE if x is a `tree_sitter_node`, otherwise FALSE.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

is_node(node)

is_node(1)
```

is_parser

Is x a parser?

Description

Checks if x is a `tree_sitter_parser` or not.

Usage

```
is_parser(x)
```

Arguments

x	[object]
	An object.

Value

TRUE if x is a `tree_sitter_parser`, otherwise FALSE.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

is_parser(parser)

is_parser(1)
```

is_query	<i>Is x a query?</i>
----------	----------------------

Description

Checks if x is a tree_sitter_query or not.

Usage

```
is_query(x)
```

Arguments

x	[object] An object.
---	------------------------

Value

TRUE if x is a tree_sitter_query, otherwise FALSE.

Examples

```
source <- "(identifier) @id"
language <- treesitter.r::language()

query <- query(language, source)

is_query(query)

is_query(1)
```

is_tree	<i>Is x a tree?</i>
---------	---------------------

Description

Checks if x is a tree_sitter_tree or not.

Usage

```
is_tree(x)
```

Arguments

x	[object] An object.
---	------------------------

Value

TRUE if x is a `tree_sitter_tree`, otherwise FALSE.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)

is_tree(tree)

is_tree(1)
```

language_field_count *Language field count*

Description

Get the number of fields contained within a language.

Usage

```
language_field_count(x)
```

Arguments

x	[<code>tree_sitter_language</code>] A tree-sitter language object.
---	---

Value

A single double value.

Examples

```
language <- treesitter.r::language()
language_field_count(language)
```

language_field_id_for_name
Language field identifiers

Description

Get the integer field identifier for a field name. If you are going to be using a field name repeatedly, it is often a little faster to use the corresponding field identifier instead.

Usage

```
language_field_id_for_name(x, name)
```

Arguments

x	[tree_sitter_language] A tree-sitter language object.
name	[character] The language field names to look up field identifiers for.

Value

An integer vector the same length as name containing:

- The field identifier for the field name, if known.
- NA, if the field name was not known.

See Also

[language_field_name_for_id\(\)](#)

Examples

```
language <- treesitter.r::language()
language_field_id_for_name(language, "lhs")
```

language_field_name_for_id
Language field names

Description

Get the field name for a field identifier.

Usage

```
language_field_name_for_id(x, id)
```

Arguments

x	[tree_sitter_language] A tree-sitter language object.
id	[integer] The language field identifiers to look up field names for.

Value

A character vector the same length as id containing:

- The field name for the field identifier, if known.
- NA, if the field identifier was not known.

See Also

[language_field_id_for_name\(\)](#)

Examples

```
language <- treesitter.r::language()
language_field_name_for_id(language, 1)
```

language_name *Language name*

Description

Extract a language object's language name.

Usage

```
language_name(x)
```


Arguments

x [tree_sitter_language]
A tree-sitter language object.

Value

A string.

Examples

```
language <- treesitter.r::language()
language_name(language)
```

language_next_state *Language state advancement*

Description

Get the next state in the grammar.

Usage

```
language_next_state(x, state, symbol)
```

Arguments

x [tree_sitter_language]
A tree-sitter language object.

state, symbol [integer]
Vectors of equal length containing the current state and symbol information.

Value

A single integer representing the next state.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to function definition
node <- node_child(node, 1)
node <- node_child(node, 3)
```

```
node

state <- node_parse_state(node)
symbol <- node_grammar_symbol(node)

# Function definition symbol
language_symbol_name(language, 85)

# Next state (this is all grammar dependent)
language_next_state(language, state, symbol)
```

language_state_count *Language state count*

Description

Get the number of states traversable within a language.

Usage

```
language_state_count(x)
```

Arguments

x [tree_sitter_language]
 A tree-sitter language object.

Value

A single double value.

Examples

```
language <- treesitter.r::language()
language_state_count(language)
```

language_symbol_count *Language symbol count*

Description

Get the number of symbols contained within a language.

Usage

```
language_symbol_count(x)
```

Arguments

x	[tree_sitter_language] A tree-sitter language object.
---	--

Value

A single double value.

Examples

```
language <- treesitter.r::language()
language_symbol_count(language)
```

language_symbol_for_name
Language symbols

Description

Get the integer symbol ID for a particular node name. Can be useful for exploring the grammar.

Usage

```
language_symbol_for_name(x, name, ..., named = TRUE)
```

Arguments

x	[tree_sitter_language] A tree-sitter language object.
name	[character] The names to look up symbols for.
...	These dots are for future extensions and must be empty.
named	[logical] Should named or anonymous nodes be looked up? Recycled to the size of name.

Value

An integer vector the same size as name containing either:

- The integer symbol ID of the node name, if known.
- NA if the node name was not known.

See Also

[language_symbol_name\(\)](#)

Examples

```
language <- treesitter.r::language()
language_symbol_for_name(language, "identifier")
```

language_symbol_name *Language symbol names*

Description

Get the name for a particular language symbol ID. Can be useful for exploring a grammar.

Usage

```
language_symbol_name(x, symbol)
```

Arguments

x	[tree_sitter_language] A tree-sitter language object.
symbol	[positive integer] The language symbols to look up names for.

Value

A character vector the same length as symbol containing:

- The name of the symbol, if known.
- NA, if the symbol was not known.

See Also

[language_symbol_for_name\(\)](#)

Examples

```
language <- treesitter.r::language()
language_symbol_name(language, 1)
```

node-child	<i>Get a node's child by index</i>
------------	------------------------------------

Description

These functions return the *i*th child of *x*.

- `node_child()` considers both named and anonymous children.
- `node_named_child()` considers only named children.

Usage

```
node_child(x, i)
```

```
node_named_child(x, i)
```

Arguments

<i>x</i>	[<code>tree_sitter_node</code>] A node.
<i>i</i>	[<code>integer(1)</code>] The index of the child to return.

Value

The *i*th child node of *x* or `NULL` if there is no child at that index.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Starts with `program` node for the whole document
node

# Navigate to first child
node <- node_child(node, 1)
node

# Note how the named variant skips the anonymous operator node
node_child(node, 2)
node_named_child(node, 2)

# OOB indices return `NULL`
node_child(node, 5)
```

node-child-by-field *Get a node's child by field id or name*

Description

These functions return children of `x` by field id or name.

- `node_child_by_field_id()` retrieves a child by field id.
- `node_child_by_field_name()` retrieves a child by field name.

Use `language_field_id_for_name()` to get the field id for a field name.

Usage

```
node_child_by_field_id(x, id)
```

```
node_child_by_field_name(x, name)
```

Arguments

<code>x</code>	<code>[tree_sitter_node]</code> A node.
<code>id</code>	<code>[integer(1)]</code> The field id of the child to return.
<code>name</code>	<code>[character(1)]</code> The field name of the child to return.

Value

A child of `x`, or NULL if no matching child can be found.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)
node

# Get the field name of the first child
name <- node_field_name_for_child(node, 1)
name
```

```

# Now get the child again by that field name
node_child_by_field_name(node, name)

# If you need to look up by field name many times, you can look up the
# more direct field id first and use that instead
id <- language_field_id_for_name(language, name)
id

node_child_by_field_id(node, id)

# Returns `NULL` if no matching child
node_child_by_field_id(node, 10000)

```

node-child-count	<i>Get a node's child count</i>
------------------	---------------------------------

Description

These functions return the number of children of x.

- `node_child_count()` considers both named and anonymous children.
- `node_named_child_count()` considers only named children.

Usage

```
node_child_count(x)
```

```
node_named_child_count(x)
```

Arguments

x	[tree_sitter_node] A node.
---	-------------------------------

Value

A single integer, the number of children of x.

Examples

```

language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)

```

```
node

# Note how the named variant doesn't count the anonymous operator node
node_child_count(node)
node_named_child_count(node)
```

node-children *Get a node's children*

Description

These functions return the children of `x` within a list.

- `node_children()` considers both named and anonymous children.
- `node_named_children()` considers only named children.

Usage

```
node_children(x)

node_named_children(x)
```

Arguments

```
x                    [tree_sitter_node]
                      A node.
```

Value

The children of `x` as a list.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)
node

# Note how the named variant doesn't include the anonymous operator node
node_children(node)
node_named_children(node)
```

node-descendant	<i>Node descendants</i>
-----------------	-------------------------

Description

These functions return the smallest node within this node that spans the given range of bytes or points. If the ranges are out of bounds, or no smaller node can be determined, the input is returned.

Usage

```
node_descendant_for_byte_range(x, start, end)
node_named_descendant_for_byte_range(x, start, end)
node_descendant_for_point_range(x, start, end)
node_named_descendant_for_point_range(x, start, end)
```

Arguments

x	[tree_sitter_node] A node.
start, end	[integer(1) / tree_sitter_point] For the byte range functions, start and end bytes to search within. For the point range functions, start and end points created by <code>point()</code> to search within.

Value

A node.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# The whole `<-` binary operator node
node <- node_child(node, 1)
node

# The byte range points to a location in the word `function`
node_descendant_for_byte_range(node, 7, 9)
node_named_descendant_for_byte_range(node, 7, 9)
```

```

start <- point(0, 14)
end <- point(0, 15)

node_descendant_for_point_range(node, start, end)
node_named_descendant_for_point_range(node, start, end)

# OOB returns the input
node_descendant_for_byte_range(node, 25, 29)

```

node-first-child-byte *Get the first child that extends beyond the given byte offset*

Description

These functions return the first child of `x` that extends beyond the given byte offset. Note that byte is a 0-indexed offset.

- `node_first_child_for_byte()` considers both named and anonymous nodes.
- `node_first_named_child_for_byte()` considers only named nodes.

Usage

```

node_first_child_for_byte(x, byte)

node_first_named_child_for_byte(x, byte)

```

Arguments

<code>x</code>	[tree_sitter_node] A node.
<code>byte</code>	[integer(1)] The byte to start the search from. Note that byte is 0-indexed!

Value

A new node, or NULL if there is no node past the byte offset.

Examples

```

language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

```

```

# Navigate to first child
node <- node_child(node, 1)
node

# `fn {here}<- function()`
node_first_child_for_byte(node, 3)
node_first_named_child_for_byte(node, 3)

# Past any node
node_first_child_for_byte(node, 100)

```

node-grammar

Node grammar types and symbols

Description

- `node_grammar_type()` gets the node's type as it appears in the grammar, *ignoring aliases*.
- `node_grammar_symbol()` gets the node's symbol (the type as a numeric id) as it appears in the grammar, *ignoring aliases*. This should be used in `language_next_state()` rather than `node_symbol()`.

Usage

```
node_grammar_type(x)
```

```
node_grammar_symbol(x)
```

Arguments

<code>x</code>	<code>[tree_sitter_node]</code> A node.
----------------	--

See Also

[node_type\(\)](#), [node_symbol\(\)](#)

Examples

```
language <- treesitter.r::language()
parser <- parser(language)
```

```
text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)
```

```

# Examples for these functions are highly specific to the grammar,
# because they relies on the placement of `alias()` calls in the grammar.
node_grammar_type(node)

```

```
node_grammar_symbol(node)
```

node-location

Node byte and point accessors

Description

These functions return information about the location of `x` in the document. The byte, row, and column locations are all 0-indexed.

- `node_start_byte()` returns the start byte.
- `node_end_byte()` returns the end byte.
- `node_start_point()` returns the start point, containing a row and column location within the document. Use accessors like `point_row()` to extract the row and column positions.
- `node_end_point()` returns the end point, containing a row and column location within the document. Use accessors like `point_row()` to extract the row and column positions.
- `node_range()` returns a range object that contains all of the above information. Use accessors like `range_start_point()` to extract individual pieces from the range.

Usage

```
node_start_byte(x)
```

```
node_end_byte(x)
```

```
node_start_point(x)
```

```
node_end_point(x)
```

```
node_range(x)
```

Arguments

<code>x</code>	<code>[tree_sitter_node]</code> A node.
----------------	--

Value

- `node_start_byte()` and `node_end_byte()` return a single numeric value.
- `node_start_point()` and `node_end_point()` return single points.
- `node_range()` returns a range.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)

# Navigate to function definition node
node <- node_child(node, 3)
node

node_start_byte(node)
node_end_byte(node)

node_start_point(node)
node_end_point(node)

node_range(node)
```

node-metadata

Node metadata

Description

These functions return metadata about the current node.

- `node_is_named()` reports if the current node is named or anonymous.
- `node_is_missing()` reports if the current node is MISSING, i.e. if it was implied through error recovery.
- `node_is_extra()` reports if the current node is an "extra" from the grammar.
- `node_is_error()` reports if the current node is an ERROR node.
- `node_has_error()` reports if the current node is an ERROR node, or if any descendants of the current node are ERROR or MISSING nodes.

Usage

```
node_is_named(x)
```

```
node_is_missing(x)
```

```
node_is_extra(x)
```

```
node_is_error(x)
```

```
node_has_error(x)
```

Arguments

```
x                [tree_sitter_node]  
                A node.
```

Value

TRUE or FALSE.

Examples

```
language <- treesitter.r::language()  
parser <- parser(language)  
  
text <- "fn <- function() { 1 + 1 }"  
tree <- parser_parse(parser, text)  
node <- tree_root_node(tree)  
  
node <- node_child(node, 1)  
  
fn <- node_child(node, 1)  
operator <- node_child(node, 2)  
  
fn  
node_is_named(fn)  
  
operator  
node_is_named(operator)  
  
# Examples of `TRUE` cases for these are a bit hard to come up with, because  
# they are dependent on the exact state of the grammar and the error recovery  
# algorithm  
node_is_missing(node)  
node_is_extra(node)
```

node-parse-state

Node parse states

Description

These are advanced functions that return information about the internal parse states.

- `node_parse_state()` returns the parse state of the current node.
- `node_next_parse_state()` returns the parse state after this node.

See [language_next_state\(\)](#) for more information.

Usage

```
node_parse_state(x)
```

```
node_next_parse_state(x)
```

Arguments

```
x                [tree_sitter_node]  
                A node.
```

Value

A single integer representing a parse state.

Examples

```
language <- treesitter.r::language()  
parser <- parser(language)  
  
text <- "fn <- function() { 1 + 1 }"  
tree <- parser_parse(parser, text)  
node <- tree_root_node(tree)  
  
node <- node_child(node, 1)  
  
# Parse states are grammar dependent  
node_parse_state(node)  
node_next_parse_state(node)
```

node-sibling *Node sibling accessors*

Description

These functions return siblings of the current node, i.e. if you looked "left" or "right" from the current node rather "up" (parent) or "down" (child).

- `node_next_sibling()` and `node_next_named_sibling()` return the next sibling.
- `node_previous_sibling()` and `node_previous_named_sibling()` return the previous sibling.

Usage

```
node_next_sibling(x)
```

```
node_next_named_sibling(x)
```

```
node_previous_sibling(x)
```

```
node_previous_named_sibling(x)
```

Arguments

x	[tree_sitter_node]
---	--------------------

A node.

Value

A sibling node, or NULL if there is no sibling node.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)

# Navigate to function definition node
node <- node_child(node, 3)
node

node_previous_sibling(node)

# Skip anonymous operator node
node_previous_named_sibling(node)

# There isn't one!
node_next_sibling(node)
```

node_descendant_count *Node descendant count*

Description

Returns the number of descendants of this node, including this node in the count.

Usage

```
node_descendant_count(x)
```


Arguments

x [tree_sitter_node]
A node.

Value

A single double.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Top level program node
node_descendant_count(node)

# The whole `<-` binary operator node
node <- node_child(node, 1)
node_descendant_count(node)

# Just the literal `<-` operator itself
node <- node_child_by_field_name(node, "operator")
node_descendant_count(node)
```

node_field_name_for_child

Get a child's field name by index

Description

node_field_name_for_child() returns the field name for the *i*th child, considering both named and anonymous nodes.

Nodes themselves don't know their own field names, because they don't know if they are fields or not. You must have access to their parents to query their field names.

Usage

```
node_field_name_for_child(x, i)
```

Arguments

x	[tree_sitter_node] A node.
i	[integer(1)] The index of the child to get the field name for.

Value

The field name for the *i*th child of *x*, or `NA_character_` if that child doesn't exist.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Navigate to first child
node <- node_child(node, 1)
node

# Get the field name of the first few children (note that anonymous children
# are considered)
node_field_name_for_child(node, 1)
node_field_name_for_child(node, 2)

# 10th child doesn't exist, this returns `NA_character_`
node_field_name_for_child(node, 10)
```

node_language

Get a node's underlying language

Description

`node_language()` returns the document text underlying a node.

Usage

```
node_language(x)
```

Arguments

x	[tree_sitter_node] A node.
---	-------------------------------

Value

A tree_sitter_language object.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

node_language(node)
```

node_parent

Get a node's parent

Description

node_parent() looks up the tree and returns the current node's parent.

Usage

```
node_parent(x)
```

Arguments

x [tree_sitter_node]
A node.

Value

The parent node of x or NULL if there is no parent.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Parent of a root node is `NULL`
node_parent(node)

node_function <- node |>
  node_child(1) |>
```

```
node_child(3)
node_function
node_parent(node_function)
```

node_raw_s_expression *"Raw" S-expression*

Description

node_raw_s_expression() returns the "raw" s-expression as seen by tree-sitter. Most of the time, [node_show_s_expression\(\)](#) provides a better view of the tree, but occasionally it can be useful to see exactly what the underlying C library is using.

Usage

```
node_raw_s_expression(x)
```

Arguments

x	[tree_sitter_node]
---	--------------------

A node.

Value

A single string containing the raw s-expression.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

node_raw_s_expression(node)
```

```
node_show_s_expression
```

Pretty print a node's s-expression

Description

node_show_s_expression() prints a nicely formatted s-expression to the console. It powers the print methods of nodes and trees.

Usage

```
node_show_s_expression(
  x,
  ...,
  max_lines = NULL,
  show_anonymous = TRUE,
  show_locations = TRUE,
  show_parentheses = TRUE,
  dangling_parenthesis = TRUE,
  color_parentheses = TRUE,
  color_locations = TRUE
)
```

Arguments

x	[tree_sitter_node] A node.
...	These dots are for future extensions and must be empty.
max_lines	[double(1) / NULL] An optional maximum number of lines to print. If the maximum is hit, then <truncated> will be printed at the end.
show_anonymous	[bool] Should anonymous nodes be shown? If FALSE, only named nodes are shown.
show_locations	[bool] Should node locations be shown?
show_parentheses	[bool] Should parentheses around each node be shown?
dangling_parenthesis	[bool] Should the) parenthesis "dangle" on its own line? If FALSE, it is appended to the line containing the last child. This can be useful for conserving space.
color_parentheses	[bool] Should parentheses be colored? Printing large s-expressions is faster if this is set to FALSE.

color_locations

[bool]

Should locations be colored? Printing large s-expressions is faster if this is set to FALSE.

Value

x invisibly.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function(a, b = 2) { a + b + 2 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

node_show_s_expression(node)

node_show_s_expression(node, max_lines = 5)

# This is more like a typical abstract syntax tree
node_show_s_expression(
  node,
  show_anonymous = FALSE,
  show_locations = FALSE,
  dangling_parenthesis = FALSE
)
```

node_symbol

Node symbol

Description

node_symbol() returns the symbol id of the current node as an integer.

Usage

```
node_symbol(x)
```

Arguments

x [tree_sitter_node]
A node.

Value

A single integer.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Top level program node
node_symbol(node)

# The whole `<-` binary operator node
node <- node_child(node, 1)
node_symbol(node)

# Just the literal `<-` operator itself
node <- node_child_by_field_name(node, "operator")
node_symbol(node)
```

node_text	<i>Get a node's underlying text</i>
-----------	-------------------------------------

Description

node_text() returns the document text underlying a node.

Usage

```
node_text(x)
```

Arguments

x	[tree_sitter_node] A node.
---	-------------------------------

Value

A single string containing the node's text.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)
```

```
node |>
  node_child(1) |>
  node_child_by_field_name("rhs") |>
  node_text()
```

node_type

Node type

Description

node_type() returns the "type" of the current node as a string.

This is a very useful function for making decisions about how to handle the current node.

Usage

```
node_type(x)
```

Arguments

x	[tree_sitter_node] A node.
---	-------------------------------

Value

A single string.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Top level program node
node_type(node)

# The whole `<-` binary operator node
node <- node_child(node, 1)
node
node_type(node)

# Just the literal `<-` operator itself
node <- node_child_by_field_name(node, "operator")
node
node_type(node)
```

node_walk	<i>Generate a TreeCursor iterator</i>
-----------	---------------------------------------

Description

node_walk() creates a [TreeCursor](#) starting at the current node. You can use it to "walk" the tree more efficiently than using [node_child\(\)](#) and other similar node functions.

Usage

```
node_walk(x)
```

Arguments

x	[tree_sitter_node] A node.
---	-------------------------------

Value

A TreeCursor object.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

cursor <- node_walk(node)

cursor$goto_first_child()
cursor$goto_first_child()
cursor$node()
cursor$goto_next_sibling()
cursor$node()
```

parser	<i>Create a new parser</i>
--------	----------------------------

Description

parser() constructs a parser from a tree-sitter language object. You can use [parser_parse\(\)](#) to parse language specific text with it.

Usage

```
parser(language)
```

Arguments

```
language      [tree_sitter_language]  
              A language object.
```

Value

A new parser.

Examples

```
language <- treesitter.r::language()  
parser <- parser(language)  
parser  
  
text <- "1 + foo"  
tree <- parser_parse(parser, text)  
tree
```

parser-adjustments *Parser adjustments*

Description

- `parser_set_language()` sets the language of the parser. This is usually done by `parser()` though.
- `parser_set_timeout()` sets an optional timeout used when calling `parser_parse()` or `parser_reparse()`. If the timeout is hit, an error occurs.
- `parser_set_included_ranges()` sets an optional list of ranges that are the only locations considered when parsing. The ranges are created by `range()`.

Usage

```
parser_set_language(x, language)  
  
parser_set_timeout(x, timeout)  
  
parser_set_included_ranges(x, included_ranges)
```

Arguments

x	[tree_sitter_parser] A parser.
language	[tree_sitter_language] A language.
timeout	[double(1)] A single whole number corresponding to a timeout in microseconds to use when parsing.
included_ranges	[list_of<tree_sitter_range>] A list of ranges constructed by <code>range()</code> . These are the only locations that will be considered when parsing. An empty list can be used to clear any existing ranges so that the parser will again parse the entire document.

Value

A new parser.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)
parser_set_timeout(parser, 10000)
```

parser-parse

Parse or reparse text

Description

- `parser_parse()` performs an initial parse of text, a string typically containing contents of a file. It returns a tree for further manipulations.
- `parser_reparse()` performs a fast incremental reparse. `text` is typically a slightly modified version of the original text with a new "edit" applied. The position of the edit is described by the `byte` and `point` arguments to this function. The `tree` argument corresponds to the original tree returned by `parser_parse()`.

All bytes and points should be 0-indexed.

Usage

```
parser_parse(x, text, ..., encoding = "UTF-8")

parser_reparse(
  x,
  text,
```

```

    tree,
    start_byte,
    start_point,
    old_end_byte,
    old_end_point,
    new_end_byte,
    new_end_point,
    ...,
    encoding = "UTF-8"
)

```

Arguments

x	[tree_sitter_parser] A parser.
text	[string] The text to parse.
...	These dots are for future extensions and must be empty.
encoding	[string] The expected encoding of the text. Either "UTF-8" or "UTF-16".
tree	[tree_sitter_tree] The original tree returned by parser_parse(). Components of the tree will be reused to perform the incremental reparse.
start_byte, start_point	[double(1) / tree_sitter_point] The starting byte and starting point of the edit location.
old_end_byte, old_end_point	[double(1) / tree_sitter_point] The old ending byte and old ending point of the edit location.
new_end_byte, new_end_point	[double(1) / tree_sitter_point] The new ending byte and new ending point of the edit location.

Value

A new tree.

Examples

```

language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)
tree

text <- "1 + bar(foo)"
parser_reparse(

```

```

    parser,
    text,
    tree,
    start_byte = 4,
    start_point = point(0, 4),
    old_end_byte = 7,
    old_end_point = point(0, 7),
    new_end_byte = 12,
    new_end_point = point(0, 12)
)

```

points

Points

Description

- `point()` creates a new tree-sitter point.
- `point_row()` and `point_column()` access a point's row and column value, respectively.
- `is_point()` determines whether or not an object is a point.

Note that points are 0-indexed. This is typically the easiest form to work with them in, since most of the time when you are provided row and column information from third party libraries, they will already be 0-indexed. It is also consistent with bytes, which are also 0-indexed and are often provided alongside their corresponding points.

Usage

```
point(row, column)
```

```
point_row(x)
```

```
point_column(x)
```

```
is_point(x)
```

Arguments

row	[double(1)] A 0-indexed row to place the point at.
column	[double(1)] A 0-indexed column to place the point at.
x	[tree_sitter_point] A point.

Value

- `point()` returns a new point.
- `point_row()` and `point_column()` return a single double.
- `is_point()` returns TRUE or FALSE.

Examples

```
x <- point(1, 2)

point_row(x)
point_column(x)

is_point(x)
```

query

Queries

Description

`query()` lets you specify a query source string for use with `query_captures()` and `query_matches()`. The source string is written in a way that is somewhat similar to the idea of capture groups in regular expressions. You write out a pattern that matches a node in a tree, and then you "capture" parts of that pattern with `@name` tags. The captures are the values returned by `query_captures()` and `query_matches()`. There are also a series of *predicates* that can be used to further refine the query. Those are described in the `query_matches()` help page.

Read the [tree-sitter documentation](#) to learn more about the query syntax.

Usage

```
query(language, source)
```

Arguments

language	[tree_sitter_language] A language.
source	[string] A query source string.

Value

A query.

Examples

```

# This query looks for binary operators where the left hand side is an
# identifier named `fn`, and the right hand side is a function definition.
# The operator can be `<-` or `=` (technically it can also be things like
# `+` as well in this example).
source <- '(binary_operator
  lhs: (identifier) @lhs
  operator: _ @operator
  rhs: (function_definition) @rhs
  (#eq? @lhs "fn")
)'
```

```

language <- treesitter.r::language()

query <- query(language, source)

text <- "
  fn <- function() {}
  fn2 <- function() {}
  fn <- 5
  fn = function(a, b, c) { a + b + c }
"

parser <- parser(language)
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

query_matches(query, node)
```

query-accessors

Query accessors

Description

- `query_pattern_count()` returns the number of patterns in a query.
- `query_capture_count()` returns the number of captures in a query.
- `query_string_count()` returns the number of string literals in a query.
- `query_start_byte_for_pattern()` returns the byte where the *i*th pattern starts in the query source.

Usage

```
query_pattern_count(x)
```

```
query_capture_count(x)
```

```
query_string_count(x)
```

```
query_start_byte_for_pattern(x, i)
```

Arguments

x	[tree_sitter_query] A query.
i	[double(1)] The ith pattern to extract the start byte for.

Value

- `query_pattern_count()`, `query_capture_count()`, and `query_string_count()` return a single double count value.
- `query_start_byte_for_pattern()` returns a single double for the start byte if there was an ith pattern, otherwise it returns NA.

Examples

```
source <- '(binary_operator
  lhs: (identifier) @lhs
  operator: _ @operator
  rhs: (function_definition) @rhs
  (#eq? @lhs "fn")
)'
```

```
language <- treesitter.r::language()

query <- query(language, source)

query_pattern_count(query)
query_capture_count(query)
query_string_count(query)

text <- "
  fn <- function() {}
  fn2 <- function() {}
  fn <- 5
  fn <- function(a, b, c) { a + b + c }
"

parser <- parser(language)
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

query_matches(query, node)
```


Description

These two functions execute a query on a given node, and return the captures of the query for further use. Both functions return the same information, just structured differently depending on your use case.

- `query_matches()` returns the captures first grouped by *pattern*, and further grouped by *match* within each pattern. This is useful if you include multiple patterns in your query.
- `query_captures()` returns a flat list of captures ordered by their node location in the original text. This is normally the easiest structure to use if you have a single pattern without any alternations that would benefit from having individual captures split by match.

Both also return the capture name, i.e. the @name you specified in your query.

Usage

```
query_matches(x, node, ..., range = NULL)
```

```
query_captures(x, node, ..., range = NULL)
```

Arguments

x	[tree_sitter_query] A query.
node	[tree_sitter_node] A node to run the query over.
...	These dots are for future extensions and must be empty.
range	[tree_sitter_range / NULL] An optional range to restrict the query to.

Predicates

There are 3 core types of predicates supported:

- `#eq? @capture "string"`
- `#eq? @capture1 @capture2`
- `#match? @capture "regex"`

Each of these predicates can also be inverted with a not- prefix, i.e. `#not-eq?` and `#not-match?`.

String double quotes:

The underlying tree-sitter predicate parser requires that strings supplied in a query must use double quotes, i.e. `"string"` not `'string'`. If you try and use single quotes, you will get a query error.

#match? regex:

The regex support provided by `#match?` is powered by `grep1()`.

Escapes are a little tricky to get right within these match regex strings. To use something like `\s` in the regex string, you need the literal text `\\s` to appear in the string to tell the tree-sitter regex engine to escape the backslash so you end up with just `\s` in the captured string. This requires putting two literal backslash characters in the R string itself, which can be accomplished

with either `"\\\\s"` or using a raw string like `r'["\\\\s"]'` which is typically a little easier. You can also write your queries in a separate file (typically called `queries.scm`) and read them into R, which is also a little more straightforward because you can just write something like `(#match? @id "^\\\\s$")` and that will be read in correctly.

Examples

```
text <- "
foo + b + a + ab
and(a)
"

source <- "(identifier) @id"

language <- treesitter.r::language()

query <- query(language, source)
parser <- parser(language)
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# A flat ordered list of captures, that's most useful here since
# we only have 1 pattern!
captures <- query_captures(query, node)
captures$node
```

ranges

Ranges

Description

- `range()` creates a new tree-sitter range.
- `range_start_byte()` and `range_end_byte()` access a range's start and end bytes, respectively.
- `range_start_point()` and `range_end_point()` access a range's start and end points, respectively.
- `is_range()` determines whether or not an object is a range.

Note that the bytes and points used in ranges are 0-indexed.

Usage

```
range(start_byte, start_point, end_byte, end_point)
```

```
range_start_byte(x)
```

```
range_start_point(x)
```

```
range_end_byte(x)
```

```
range_end_point(x)
```

```
is_range(x)
```

Arguments

start_byte, end_byte

[double(1)]

0-indexed bytes for the start and end of the range, respectively.

start_point, end_point

[tree_sitter_point]

0-indexed points for the start and end of the range, respectively.

x

[tree_sitter_range]

A range.

Value

- `range()` returns a new range.
- `range_start_byte()` and `range_end_byte()` return a single double.
- `range_start_point()` and `range_end_point()` return a [point\(\)](#).
- `is_range()` returns TRUE or FALSE.

See Also

[node_range\(\)](#)

Examples

```
x <- range(5, point(1, 3), 7, point(1, 5))
```

```
x
```

```
range_start_byte(x)
```

```
range_end_byte(x)
```

```
range_start_point(x)
```

```
range_end_point(x)
```

```
is_range(x)
```

text_parse	<i>Parse a snippet of text</i>
------------	--------------------------------

Description

`text_parse()` is a convenience utility for quickly parsing a small snippet of text using a particular language and getting access to its root node. It is meant for demonstration purposes. If you are going to need to reparse the text after an edit has been made, you should create a full parser with `parser()` and use `parser_parse()` instead.

Usage

```
text_parse(x, language)
```

Arguments

<code>x</code>	[string] The text to parse.
<code>language</code>	[tree_sitter_language] The language to parse with.

Value

A root node.

Examples

```
language <- treesitter.r::language()
text <- "map(xs, function(x) 1 + 1)"

# Note that this directly returns the root node, not the tree
text_parse(text, language)
```

tree-accessors	<i>Tree accessors</i>
----------------	-----------------------

Description

- `tree_text()` retrieves the tree's text that it was parsed with.
- `tree_language()` retrieves the tree's language that it was parsed with.
- `tree_included_ranges()` retrieves the tree's `included_ranges` that were provided to `parser_set_included_range`. Note that if no ranges were provided originally, then this still returns a default that always covers the entire document.

Usage

```
tree_included_ranges(x)
```

```
tree_text(x)
```

```
tree_language(x)
```

Arguments

```
x                [tree_sitter_tree]  
                A tree.
```

Value

- `tree_text()` returns a string.
- `tree_language()` returns a `tree_sitter_language`.
- `tree_included_ranges()` returns a list of `range()` objects.

Examples

```
language <- treesitter.r::language()  
parser <- parser(language)  
  
text <- "1 + foo"  
tree <- parser_parse(parser, text)  
  
tree_text(tree)  
tree_language(tree)  
tree_included_ranges(tree)
```

TreeCursor

Tree cursors

Description

TreeCursor is an R6 class that allows you to walk a tree in a more efficient way than calling `node_*`() functions like `node_child()` repeatedly.

You can also more elegantly create a cursor with `node_walk()` and `tree_walk()`.

Value

R6 object representing the tree cursor.

Methods

Public methods:

- `TreeCursor$new()`
- `TreeCursor$reset()`
- `TreeCursor$node()`
- `TreeCursor$field_name()`
- `TreeCursor$field_id()`
- `TreeCursor$descendant_index()`
- `TreeCursor$goto_parent()`
- `TreeCursor$goto_next_sibling()`
- `TreeCursor$goto_previous_sibling()`
- `TreeCursor$goto_first_child()`
- `TreeCursor$goto_last_child()`
- `TreeCursor$depth()`
- `TreeCursor$goto_first_child_for_byte()`
- `TreeCursor$goto_first_child_for_point()`

Method `new()`: Create a new tree cursor.

Usage:

```
TreeCursor$new(node)
```

Arguments:

```
node [tree_sitter_node]  
    The node to start walking from.
```

Method `reset()`: Reset the tree cursor to a new root node.

Usage:

```
TreeCursor$reset(node)
```

Arguments:

```
node [tree_sitter_node]  
    The node to start walking from.
```

Method `node()`: Get the current node that the cursor points to.

Usage:

```
TreeCursor$node()
```

Method `field_name()`: Get the field name of the current node.

Usage:

```
TreeCursor$field_name()
```

Method `field_id()`: Get the field id of the current node.

Usage:

```
TreeCursor$field_id()
```

Method `descendant_index()`: Get the descendent index of the current node.

Usage:

```
TreeCursor$descendant_index()
```

Method `goto_parent()`: Go to the current node's parent.

Returns TRUE if a parent was found, and FALSE if not.

Usage:

```
TreeCursor$goto_parent()
```

Method `goto_next_sibling()`: Go to the current node's next sibling.

Returns TRUE if a sibling was found, and FALSE if not.

Usage:

```
TreeCursor$goto_next_sibling()
```

Method `goto_previous_sibling()`: Go to the current node's previous sibling.

Returns TRUE if a sibling was found, and FALSE if not.

Usage:

```
TreeCursor$goto_previous_sibling()
```

Method `goto_first_child()`: Go to the current node's first child.

Returns TRUE if a child was found, and FALSE if not.

Usage:

```
TreeCursor$goto_first_child()
```

Method `goto_last_child()`: Go to the current node's last child.

Returns TRUE if a child was found, and FALSE if not.

Usage:

```
TreeCursor$goto_last_child()
```

Method `depth()`: Get the depth of the current node.

Usage:

```
TreeCursor$depth()
```

Method `goto_first_child_for_byte()`: Move the cursor to the first child of its current node that extends beyond the given byte offset.

Returns TRUE if a child was found, and FALSE if not.

Usage:

```
TreeCursor$goto_first_child_for_byte(byte)
```

Arguments:

```
byte [double(1)]
```

The byte to move the cursor past.

Method `goto_first_child_for_point()`: Move the cursor to the first child of its current node that extends beyond the given point.

Returns TRUE if a child was found, and FALSE if not.

Usage:

```
TreeCursor$goto_first_child_for_point(point)
```

Arguments:

```
point [tree_sitter_point]  
The point to move the cursor past.
```

Examples

```
language <- treesitter.r::language()  
parser <- parser(language)  
  
text <- "fn <- function(a, b) { a + b }"  
  
tree <- parser_parse(parser, text)  
node <- tree_root_node(tree)  
  
cursor <- TreeCursor$new(node)  
  
cursor$node()  
cursor$goto_first_child()  
cursor$goto_first_child()  
cursor$node()  
cursor$goto_next_sibling()  
cursor$node()
```

tree_root_node	<i>Retrieve the root node of the tree</i>
----------------	---

Description

tree_root_node() is the entry point for accessing nodes within a specific tree. It returns the "root" of the tree, from which you can use other node_*() functions to navigate around.

Usage

```
tree_root_node(x)
```

Arguments

```
x [tree_sitter_tree]  
A tree.
```

Value

A node.

Examples

```

language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)
node <- tree_root_node(tree)

# Trees and nodes have a similar print method, but you can
# only use other `node_*()` functions on nodes.
tree
node

node |>
  node_child(1) |>
  node_children()

```

```
tree_root_node_with_offset
```

Retrieve an offset root node

Description

`tree_root_node_with_offset()` is similar to `tree_root_node()`, but the returned root node's position has been shifted by the given number of bytes, rows, and columns.

This function allows you to parse a subset of a document with `parser_parse()` as if it were a self-contained document, but then later access the syntax tree in the coordinate space of the larger document.

Note that the underlying text within `x` is not what you are offsetting into. Instead, you should assume that the text you provided to `parser_parse()` already contained the entire subset of the document you care about, and the offset you are providing is how far into the document the beginning of text is.

Usage

```
tree_root_node_with_offset(x, byte, point)
```

Arguments

<code>x</code>	<code>[tree_sitter_tree]</code> A tree.
<code>byte, point</code>	<code>[double(1), tree_sitter_point]</code> A byte and point offset combination.

Value

An offset root node.

Examples

```

language <- treesitter.r::language()
parser <- parser(language)

text <- "fn <- function() { 1 + 1 }"
tree <- parser_parse(parser, text)

# If `text` was the whole document, you can just use `tree_root_node()`
node <- tree_root_node(tree)

# If `text` represents a subset of the document, use
# `tree_root_node_with_offset()` to be able to get positions in the
# coordinate space of the original document.
byte <- 5
point <- point(5, 0)
node_offset <- tree_root_node_with_offset(tree, byte, point)

# The position of `fn` if you treat `text` as the whole document
node |>
  node_child(1) |>
  node_child(1)

# The position of `fn` if you treat `text` as a subset of a larger document
node_offset |>
  node_child(1) |>
  node_child(1)

```

tree_walk

Generate a TreeCursor iterator

Description

tree_walk() creates a [TreeCursor](#) starting at the root node. You can use it to "walk" the tree more efficiently than using [node_child\(\)](#) and other similar node functions.

Usage

```
tree_walk(x)
```

Arguments

x	[tree_sitter_tree]
	A tree.

Value

A TreeCursor object.

Examples

```
language <- treesitter.r::language()
parser <- parser(language)

text <- "1 + foo"
tree <- parser_parse(parser, text)

cursor <- tree_walk(tree)

cursor$goto_first_child()
cursor$goto_first_child()
cursor$node()
cursor$goto_next_sibling()
cursor$node()
```

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