cdatastruct

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Data Structure Documentation

3.1 sl_list_node_t Struct Reference

Struct for singly linked list node.

`#include <cds_sl_list.h>`

Collaboration diagram for sl_list_node_t:

Data Fields

- void * data
- struct sl_list_node_t * next

3.1.1 Field Documentation

3.1.1.1 void* sl_list_node_t::data

Pointer to data

3.1.1.2 struct sl_list_node_t* sl_list_node_t::next

Pointer to next node

The documentation for this struct was generated from the following file:

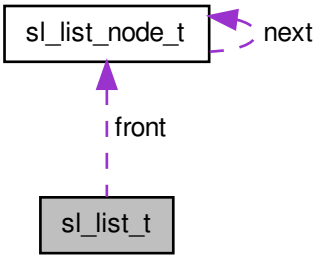
- cds_sl_list.h

3.2 sl_list_t Struct Reference

Struct to contain a list.

`#include <sl_list.h>`

Collaboration diagram for sl_list_t:



Data Fields

- struct sl_list_node_t * front
- size_t length
- int(* cfunc)()

3.2.1 Field Documentation

3.2.1.1 int(* sl_list_t::cfunc)()

Pointer to compare function

3.2.1.2 struct sl_list_node_t* sl_list_t::front

Pointer to first node

3.2.1.3 size_t sl_list_t::length

Length of list

The documentation for this struct was generated from the following file:

- sl_list.h

Chapter 4

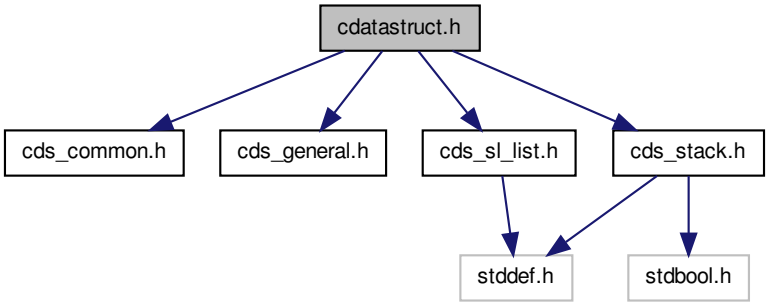
File Documentation

4.1 cdatastruct.h File Reference

Interface to generic C data structures.

```
#include "cds_common.h"
#include "cds_general.h"
#include "cds_sl_list.h"
#include "cds_stack.h"
```

Include dependency graph for cdatastruct.h:



4.1.1 Detailed Description

Interface to generic C data structures.

Author

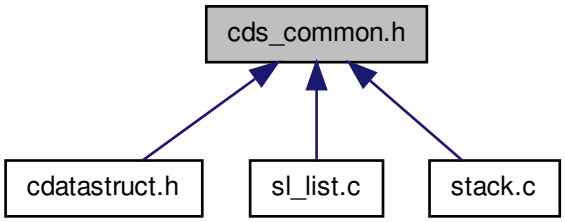
Paul Griffiths

Copyright

4.2 cds_common.h File Reference

Common data types and data for C data structures library.

This graph shows which files directly or indirectly include this file:



Typedefs

- typedef enum cds_error cds_error

  Enumeration of return error codes.

Enumerations

- enum cds_error { CDSERR_ERROR = -1, CDSERR_OUTOFRANGE = -2, CDSERR_NOTFOUND = -3, CDSERR_BADITERATOR = -4 }

  Enumeration of return error codes.

4.2.1 Detailed Description

Author

Paul Griffiths

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4.2.2 Enumeration Type Documentation

4.2.2.1 enum cds_error

Enumerator:

CDSERR_ERROR Unspecified error

CDSERR_OUTOFRANGE Index out of range

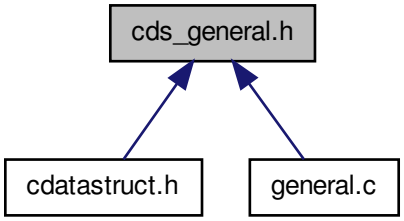
CDSERR_NOTFOUND Data element not found

CDSERR_BADITERATOR Invalid iterator

4.3 cds_general.h File Reference

Interface to general data structure helper functions.

This graph shows which files directly or indirectly include this file:



Functions

- void * cds_new_int (const int n)
  Dynamically allocates memory for a new `int`.
- void * cds_new_uint (const unsigned int n)
  Dynamically allocates memory for a new `unsigned int`.
- void * cds_new_long (const long n)
  Dynamically allocates memory for a new `long`.
- void * cds_new_ulong (const unsigned long n)
  Dynamically allocates memory for a new `unsigned long`.
- void * cds_new_string (const char *str)
  Dynamically allocates memory for a new string.
- int cds_compare_int (const void *data, const void *cmp)
  Compares two `int` via `void` pointers.
- int cds_compare_uint (const void *data, const void *cmp)
  Compares two `unsigned int` via `void` pointers.
- int cds_compare_long (const void *data, const void *cmp)
  Compares two `long` via `void` pointers.
- int cds_compare_ulong (const void *data, const void *cmp)
  Compares two `unsigned long` via `void` pointers.
- int cds_compare_string (const void *data, const void *cmp)
  Compares two strings via `void` pointers.

4.3.1 Detailed Description

Interface to general data structure helper functions.

Author

Paul Griffiths

Copyright

4.3.2 Function Documentation

4.3.2.1 int cds_compare_int (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.3.2.2 int cds_compare_long (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.3.2.3 int cds_compare_string (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.3.2.4 int cds_compare_uint (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.3.2.5 int cds_compare_ulong (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.3.2.6 void* cds_new_int (const int *n*)

Parameters

n	The new `int` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.3.2.7 void* cds_new_long (const long *n*)

Parameters

n	The new `long` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.3.2.8 void* cds_new_string (const char * *str*)

Parameters

str	The new string for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.3.2.9 void* cds_new_uint (const unsigned int *n*)

Parameters

n	The new `unsigned int` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.3.2.10 void* cds_new_ulong (const unsigned long *n*)

Parameters

n	The new `unsigned long` for which to allocate.

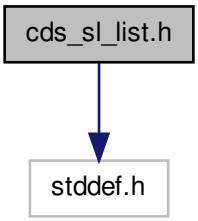
Returns

A `void` pointer to the allocated memory.

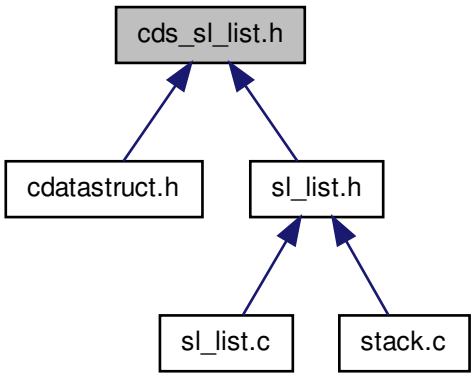
4.4 cds_sl_list.h File Reference

User interface to singly linked list data structure.

`#include <stddef.h>`
Include dependency graph for cds_sl_list.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct sl_list_node_t

  Struct for singly linked list node.

Typedefs

- typedef struct sl_list_node_t sl_list_node_t

  Struct for singly linked list node.
- typedef struct sl_list_t * sl_list

  Typedef for list pointer.
- typedef struct sl_list_node_t * sl_list_itr

  Typedef for list iterator.

Functions

- sl_list sl_list_init (int(*cfunc)(const void *, const void *))

  Initializes a new singly linked list.
- void sl_list_free (sl_list list)

  Frees the resources associated with a list.
- size_t sl_list_length (const sl_list list)

  Returns the number of elements in a list.
- bool sl_list_isempty (const sl_list list)

  Checks if a list is empty.
- void sl_list_prepend (sl_list list, void *data)

  Inserts an element at the beginning of a list.
- int sl_list_insert_at (sl_list list, const size_t index, void *data)

  Inserts an element at the specified index of a list.
- int sl_list_insert_after (sl_list list, const sl_list_itr itr, void *data)

  Inserts an element after a provided iterator.
- int sl_list_find_index (const sl_list list, const void *data)

  Finds the index of the specified data in a list.
- sl_list_itr sl_list_find_itr (const sl_list list, const void *data)

  Gets an iterator to the specified data in a list.
- void * sl_list_data (const sl_list list, const size_t index)

  Returns a pointer to the data at a specified index.
- sl_list_itr sl_list_first (const sl_list list)

  Returns an iterator to the first element of a list.
- sl_list_itr sl_list_next (const sl_list_itr itr)

  Advances a list iterator by one element.
- sl_list_itr sl_list_index (const sl_list list, const size_t index)

  Return an iterator to a specified element of a list.
- int sl_list_delete_at (sl_list list, const size_t index)

  Deletes a list element at a specified index.

4.4.1 Detailed Description

Author

Paul Griffiths

Copyright

4.4.2 Function Documentation

4.4.2.1 void* sl_list_data (const sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the data.

Returns

A pointer to the data, or NULL if the index is out of range.

4.4.2.2 int sl_list_delete_at (sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the element to delete.

Returns

0 on success, CDSERR_OUTOFRANGE if the the index is out of range.

4.4.2.3 int sl_list_find_index (const sl_list *list,* const void * *data*)

Parameters

list	A pointer to the list.
data	A pointer to the data to find.

Returns

The index of the element, if found, or CDSERR_NOTFOUND if it is not in the list.

4.4.2.4 sl_list_itr sl_list_find_itr (const sl_list *list,* const void * *data*)

Parameters

list	A pointer to the list.
data	A pointer to the data to find.

Returns

An iterator to the found element, or NULL is the element is not in the list.

4.4.2.5 sl_list_itr sl_list_first (const sl_list *list*)

Parameters

list	A pointer to the list.

Returns

An iterator to the first element.

4.4.2.6 void sl_list_free (sl_list *list*)

Parameters

list	A pointer to the list to free.

4.4.2.7 sl_list_itr sl_list_index (const sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The specified index.

Returns

The iterator, or NULL if `index` is out of range.

4.4.2.8 sl_list sl_list_init (int(∗)(const void ∗, const void ∗) *cfunc*)

Parameters

cfunc	A pointer to a compare function. The function should return `int` and accept two parameters of type `void *`. It should return less than 1 if the first parameter is less than the second, greater than 1 if the first parameter is greater than the second, and zero if the parameters are equal.

Returns

A pointer to the new list.

4.4.2.9 int sl_list_insert_after (sl_list *list,* const sl_list_itr *itr,* void ∗ *data*)

Parameters

list	A pointer to the list.
itr	The iterator after which to insert.
data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

Returns

0 on success, CDSERR_BADITERATOR if `itr` is a NULL pointer.

4.4.2.10 int sl_list_insert_at (sl_list *list,* const size_t *index,* void ∗ *data*)

Parameters

list	A pointer to the list.
index	The index at which to insert. Setting this equal to the length of the list (i.e. to one element past the zero-based index of the last element) inserts the element at the end of the list.

data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

Returns

0 on success, CDSERR_OUTOFRANGE if `index` exceeds the length of the list.

4.4.2.11 bool sl_list_isempty (const sl_list *list*)

Parameters

list	A pointer to the list.

Returns

`true` if the list is empty, otherwise `false`.

4.4.2.12 size_t sl_list_length (const sl_list *list*)

Parameters

list	A pointer to the list.

4.4.2.13 sl_list_itr sl_list_next (const sl_list_itr *itr*)

Parameters

itr	The iterator to advance

Returns

The advanced iterator.

4.4.2.14 void sl_list_prepend (sl_list *list,* void * *data*)

Parameters

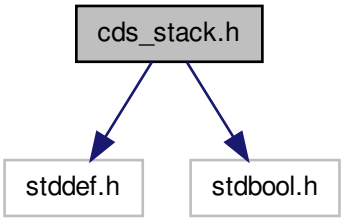
list	A pointer to the list.
data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

4.5 cds_stack.h File Reference

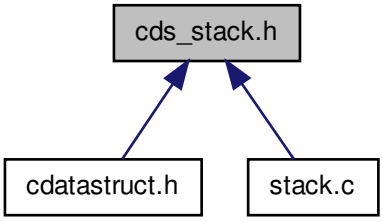
User interface to stack data structure.

```
#include <stddef.h>
#include <stdbool.h>
```

Include dependency graph for cds_stack.h:



This graph shows which files directly or indirectly include this file:



Typedefs

- typedef struct sl_list_t * stack

  Typedef for stack pointer.

Functions

- stack stack_init (void)

  Initializes a new stack.
- void stack_free (stack stk)

  Frees memory and releases resources used by a stack.
- size_t stack_length (const stack stk)

  Gets the number of items in a stack.
- bool stack_isempty (const stack stk)

  Checks if a stack is empty.
- void * stack_pop (stack stk)

  Pops a data item from the stack.
- void stack_push (stack stk, void *data)

  Pushes a data item onto the stack.

4.5.1 Detailed Description

Author

Paul Griffiths

Copyright

4.5.2 Function Documentation

4.5.2.1 void stack_free (stack *stk*)

Parameters

stk	A pointer to the stack.

4.5.2.2 stack stack_init (void)

Returns

A pointer to the new stack.

4.5.2.3 bool stack_isempty (const stack *stk*)

Parameters

stk	A pointer to the stack.

Returns

`true` is the stack is empty, `false` if not.

4.5.2.4 size_t stack_length (const stack *stk*)

Parameters

stk	A pointer to the stack.

Returns

The number of items in the stack.

4.5.2.5 void* stack_pop (stack *stk*)

The item returned was previously allocated using `malloc()`, so the user must `free()` the returned pointer when done.

Parameters

stk	A pointer to the stack.

Returns

A `void` pointer to the popped data item.

4.5.2.6 void stack_push (stack *stk*, void * *data*)

The provided pointer should point to dynamically allocated memory.

Parameters

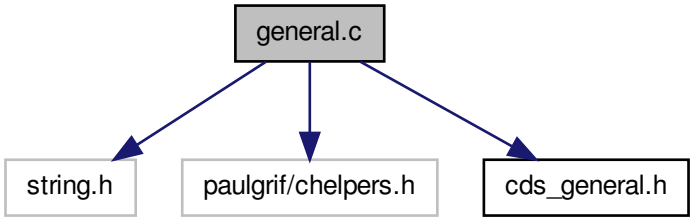
stk	A pointer to the stack.
data	A pointer to the data item to be pushed.

4.6 general.c File Reference

Implementation of general data structure helper functions.

```
#include <string.h>
#include <paulgrif/chelpers.h>
#include "cds_general.h"
```

Include dependency graph for general.c:



Functions

- void * cds_new_int (const int n)

  Dynamically allocates memory for a new `int`.
- void * cds_new_uint (const unsigned int n)

  Dynamically allocates memory for a new `unsigned int`.
- void * cds_new_long (const long n)

  Dynamically allocates memory for a new `long`.
- void * cds_new_ulong (const unsigned long n)

  Dynamically allocates memory for a new `unsigned long`.
- void * cds_new_string (const char *str)

  Dynamically allocates memory for a new string.
- int cds_compare_int (const void *data, const void *cmp)

  Compares two `int` via `void` pointers.
- int cds_compare_uint (const void *data, const void *cmp)

  Compares two `unsigned int` via `void` pointers.

- int cds_compare_long (const void *data, const void *cmp)

  Compares two `long` via `void` pointers.
- int cds_compare_ulong (const void *data, const void *cmp)

  Compares two `unsigned long` via `void` pointers.
- int cds_compare_string (const void *data, const void *cmp)

  Compares two strings via `void` pointers.

4.6.1 Detailed Description

Implementation of general data structure helper functions.

Author

Paul Griffiths

Copyright

4.6.2 Function Documentation

4.6.2.1 int cds_compare_int (const void * *data*, const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.6.2.2 int cds_compare_long (const void * *data*, const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.6.2.3 int cds_compare_string (const void * *data*, const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.6.2.4 int cds_compare_uint (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.6.2.5 int cds_compare_ulong (const void * *data,* const void * *cmp*)

Parameters

data	Pointer to the data to which to compare.
cmp	Pointer to the comparison data.

Returns

-1 if the comparison data is greater than the data, 1 if the comparison data is less than the data, and 0 if the comparison data is equal to the data.

4.6.2.6 void* cds_new_int (const int *n*)

Parameters

n	The new `int` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.6.2.7 void* cds_new_long (const long *n*)

Parameters

n	The new `long` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.6.2.8 void* cds_new_string (const char * *str*)

Parameters

str	The new string for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.6.2.9 void* cds_new_uint (const unsigned int *n*)

Parameters

n	The new `unsigned int` for which to allocate.

Returns

A `void` pointer to the allocated memory.

4.6.2.10 void* cds_new_ulong (const unsigned long *n*)

Parameters

n	The new `unsigned long` for which to allocate.

Returns

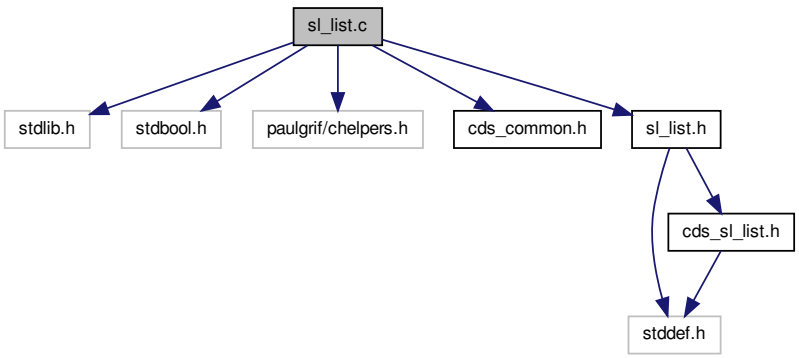
A `void` pointer to the allocated memory.

4.7 sl_list.c File Reference

Implementation of singly linked list data structure.

```
#include <stdlib.h>
#include <stdbool.h>
#include <paulgrif/chelpers.h>
#include "cds_common.h"
#include "sl_list.h"
```

Include dependency graph for sl_list.c:



Functions

- sl_list sl_list_init (int(*cfunc)(const void *, const void *))

  Initializes a new singly linked list.
- void sl_list_free (sl_list list)

  Frees the resources associated with a list.
- size_t sl_list_length (const sl_list list)

  Returns the number of elements in a list.
- bool sl_list_isempty (const sl_list list)

  Checks if a list is empty.
- void sl_list_prepend (sl_list list, void *data)

  Inserts an element at the beginning of a list.
- int sl_list_insert_at (sl_list list, const size_t index, void *data)

  Inserts an element at the specified index of a list.
- int sl_list_insert_after (sl_list list, const sl_list_itr itr, void *data)

  Inserts an element after a provided iterator.
- int sl_list_find_index (const sl_list list, const void *data)

  Finds the index of the specified data in a list.
- sl_list_itr sl_list_find_itr (const sl_list list, const void *data)

  Gets an iterator to the specified data in a list.
- void * sl_list_data (const sl_list list, const size_t index)

  Returns a pointer to the data at a specified index.
- sl_list_itr sl_list_first (const sl_list list)

  Returns an iterator to the first element of a list.
- sl_list_itr sl_list_next (const sl_list_itr itr)

  Advances a list iterator by one element.
- sl_list_itr sl_list_index (const sl_list list, const size_t index)

  Return an iterator to a specified element of a list.
- int sl_list_delete_at (sl_list list, const size_t index)

  Deletes a list element at a specified index.
- sl_list_node sl_list_remove_at (sl_list list, const size_t index)

  Removes, but does not delete, an element at an index.
- sl_list_node sl_list_new_node (void *data)

  Creates a new list node.
- void sl_list_free_node (sl_list_node node)

  Frees resources for a node and any data.

4.7.1 Detailed Description

Author

Paul Griffiths

Copyright

4.7.2 Function Documentation

4.7.2.1 void* sl_list_data (const sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the data.

Returns

A pointer to the data, or NULL if the index is out of range.

4.7.2.2 int sl_list_delete_at (sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the element to delete.

Returns

0 on success, CDSERR_OUTOFRANGE if the the index is out of range.

4.7.2.3 int sl_list_find_index (const sl_list *list,* const void * *data*)

Parameters

list	A pointer to the list.
data	A pointer to the data to find.

Returns

The index of the element, if found, or CDSERR_NOTFOUND if it is not in the list.

4.7.2.4 sl_list_itr sl_list_find_itr (const sl_list *list,* const void * *data*)

Parameters

list	A pointer to the list.
data	A pointer to the data to find.

Returns

An iterator to the found element, or NULL is the element is not in the list.

4.7.2.5 sl_list_itr sl_list_first (const sl_list *list*)

Parameters

list	A pointer to the list.

Returns

An iterator to the first element.

4.7.2.6 void sl_list_free (sl_list *list*)

Parameters

list	A pointer to the list to free.

4.7.2.7 void sl_list_free_node (sl_list_node *node*)

Parameters

node	A pointer to the node to free.

4.7.2.8 sl_list_itr sl_list_index (const sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The specified index.

Returns

The iterator, or NULL if `index` is out of range.

4.7.2.9 sl_list sl_list_init (int(*)(const void *, const void *) *cfunc*)

Parameters

cfunc	A pointer to a compare function. The function should return `int` and accept two parameters of type `void *`. It should return less than 1 if the first parameter is less than the second, greater than 1 if the first parameter is greater than the second, and zero if the parameters are equal.

Returns

A pointer to the new list.

4.7.2.10 int sl_list_insert_after (sl_list *list,* const sl_list_itr *itr,* void * *data*)

Parameters

list	A pointer to the list.
itr	The iterator after which to insert.
data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

Returns

0 on success, CDSERR_BADITERATOR if `itr` is a NULL pointer.

4.7.2.11 int sl_list_insert_at (sl_list *list*, const size_t *index*, void * *data*)

Parameters

list	A pointer to the list.
index	The index at which to insert. Setting this equal to the length of the list (i.e. to one element past the zero-based index of the last element) inserts the element at the end of the list.
data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

Returns

0 on success, CDSERR_OUTOFRANGE if `index` exceeds the length of the list.

4.7.2.12 bool sl_list_isempty (const sl_list *list*)

Parameters

list	A pointer to the list.

Returns

`true` if the list is empty, otherwise `false`.

4.7.2.13 size_t sl_list_length (const sl_list *list*)

Parameters

list	A pointer to the list.

4.7.2.14 sl_list_node sl_list_new_node (void * *data*)

Parameters

data	The data for the new node.

Returns

A pointer to the newly created node.

4.7.2.15 sl_list_itr sl_list_next (const sl_list_itr *itr*)

Parameters

itr	The iterator to advance

Returns

The advanced iterator.

4.7.2.16 void sl_list_prepend (sl_list *list*, void * *data*)

Parameters

list	A pointer to the list.
data	A pointer to the data to add. The memory pointed to by this parameter must be dynamically allocated, as an attempt will be made to `free()` it when deleting the list.

4.7.2.17 sl_list_node sl_list_remove_at (sl_list *list*, const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the element to be removed.

Returns

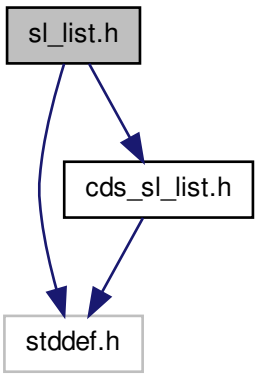
A pointer to the removed node. This should be `free()`d by calling sl_list_free_node().

4.8 sl_list.h File Reference

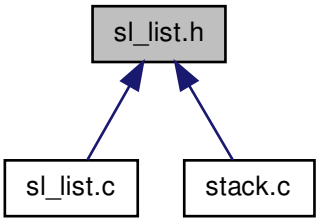
Developer interface to singly linked list data structure.

```
#include <stddef.h>
#include "cds_sl_list.h"
```

Include dependency graph for sl_list.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct sl_list_t

  Struct to contain a list.

Typedefs

- typedef struct sl_list_t sl_list_t

  Struct to contain a list.
- typedef struct sl_list_node_t * sl_list_node

  Typedef for list node.

Functions

- sl_list_node sl_list_remove_at (sl_list list, const size_t index)

  Removes, but does not delete, an element at an index.
- sl_list_node sl_list_new_node (void *data)

  Creates a new list node.
- void sl_list_free_node (sl_list_node node)

  Frees resources for a node and any data.

4.8.1 Detailed Description

Author

Paul Griffiths

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4.8.2 Function Documentation

4.8.2.1 void sl_list_free_node (sl_list_node *node*)

Parameters

node	A pointer to the node to free.

4.8.2.2 sl_list_node sl_list_new_node (void * *data*)

Parameters

data	The data for the new node.

Returns

A pointer to the newly created node.

4.8.2.3 sl_list_node sl_list_remove_at (sl_list *list,* const size_t *index*)

Parameters

list	A pointer to the list.
index	The index of the element to be removed.

Returns

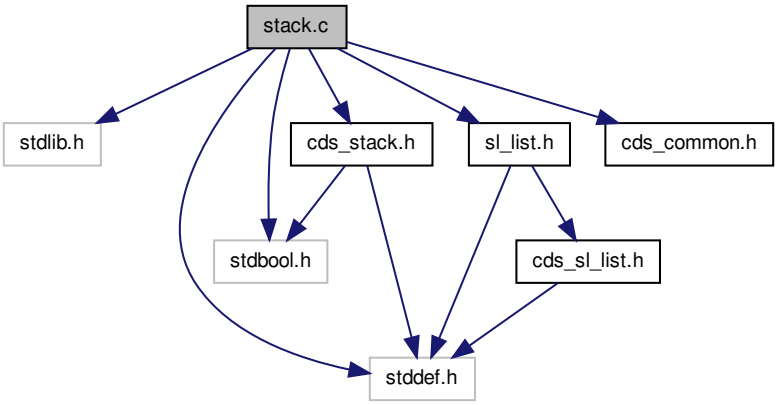
A pointer to the removed node. This should be `free()`d by calling sl_list_free_node().

4.9 stack.c File Reference

Implementation of stack data structure.

```
#include <stdlib.h>
#include <stddef.h>
#include <stdbool.h>
#include "cds_stack.h"
#include "sl_list.h"
#include "cds_common.h"
```

Include dependency graph for stack.c:



Functions

- stack stack_init (void)

  Initializes a new stack.
- void stack_free (stack stk)

  Frees memory and releases resources used by a stack.
- size_t stack_length (const stack stk)

  Gets the number of items in a stack.
- bool stack_isempty (const stack stk)

  Checks if a stack is empty.
- void * stack_pop (stack stk)

  Pops a data item from the stack.
- void stack_push (stack stk, void *data)

  Pushes a data item onto the stack.

4.9.1 Detailed Description

Implemented in terms of a singly linked, singled-ended list data structure.

Author

Paul Griffiths

Copyright

4.9.2 Function Documentation

4.9.2.1 void stack_free (stack *stk*)

Parameters

stk	A pointer to the stack.

4.9.2.2 stack stack_init (void)

Returns

A pointer to the new stack.

4.9.2.3 bool stack_isempty (const stack *stk*)

Parameters

stk	A pointer to the stack.

Returns

`true` is the stack is empty, `false` if not.

4.9.2.4 size_t stack_length (const stack *stk*)

Parameters

stk	A pointer to the stack.

Returns

The number of items in the stack.

4.9.2.5 void* stack_pop (stack *stk*)

The item returned was previously allocated using `malloc()`, so the user must `free()` the returned pointer when done.

Parameters

stk	A pointer to the stack.

Returns

A `void` pointer to the popped data item.

4.9.2.6 void stack_push (stack *stk,* void * *data*)

The provided pointer should point to dynamically allocated memory.

Parameters

stk	A pointer to the stack.
data	A pointer to the data item to be pushed.

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