

libft

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# 1 libft

*This project is part of the official curriculum at [School 42](#).*

## 1.0.1 Overview

- [Official instructions](#)
- The task is to recreate various standard C library functions, as well as additional useful functions.
- Documentation ( [html](#), [pdf](#)) generated with [Doxygen](#).
- The project is consistent with the [Norme](#), the code standard accepted at *School 42*.
- Use `make` to compile the library and include in projects with `#include "libft.h"`
- This project has been tested with [Moullitest](#).

## 1.0.2 Acknowledgements

My thanks go to [yyang42](#) for making Moullitest freely available online, to the entire team behind School 42 and its [Moscow branch](#), to my fellow students for fruitful discussions, as well as to creators and maintainers of Doxygen.

## 2 Data Structure Index

### 2.1 Data Structures

Here are the data structures with brief descriptions:

|                        |                   |
|------------------------|-------------------|
| <a href="#">s_list</a> | <a href="#">4</a> |
|------------------------|-------------------|

## 3 File Index

### 3.1 File List

Here is a list of all documented files with brief descriptions:

|                                    |                    |
|------------------------------------|--------------------|
| <a href="#">libft.h</a>            | <a href="#">6</a>  |
| <a href="#">src/ft_abs.c</a>       | <a href="#">??</a> |
| <a href="#">src/ft_atoi.c</a>      | <a href="#">??</a> |
| <a href="#">src/ft_bzero.c</a>     | <a href="#">??</a> |
| <a href="#">src/ft_calloc.c</a>    | <a href="#">??</a> |
| <a href="#">src/ft_isalnum.c</a>   | <a href="#">??</a> |
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| <a href="#">src/ft_isascii.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_isdigit.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_isprint.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_isspace.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_itoa.c</a>      | <a href="#">??</a> |
| <a href="#">src/ft_lstadd.c</a>    | <a href="#">??</a> |
| <a href="#">src/ft_lstappend.c</a> | <a href="#">??</a> |
| <a href="#">src/ft_lstdel.c</a>    | <a href="#">??</a> |
| <a href="#">src/ft_lstdelone.c</a> | <a href="#">??</a> |
| <a href="#">src/ft_lstiter.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_lstlast.c</a>   | <a href="#">??</a> |
| <a href="#">src/ft_lstmap.c</a>    | <a href="#">??</a> |
| <a href="#">src/ft_lstnew.c</a>    | <a href="#">??</a> |
| <a href="#">src/ft_max.c</a>       | <a href="#">??</a> |
| <a href="#">src/ft_memalloc.c</a>  | <a href="#">??</a> |

|                        |    |
|------------------------|----|
| src/ft_memccpy.c       | ?? |
| src/ft_memchr.c        | ?? |
| src/ft_memcmp.c        | ?? |
| src/ft_memcpy.c        | ?? |
| src/ft_memdel.c        | ?? |
| src/ft_memmove.c       | ?? |
| src/ft_memset.c        | ?? |
| src/ft_min.c           | ?? |
| src/ft_power.c         | ?? |
| src/ft_putchar.c       | ?? |
| src/ft_putchar_fd.c    | ?? |
| src/ft_putendl.c       | ?? |
| src/ft_putendl_fd.c    | ?? |
| src/ft_putnbr.c        | ?? |
| src/ft_putnbr_fd.c     | ?? |
| src/ft_putstr.c        | ?? |
| src/ft_putstr_fd.c     | ?? |
| src/ft_puts.c          | ?? |
| src/ft_putstr.c        | ?? |
| src/ft_putstr_fd.c     | ?? |
| src/ft_sqrt.c          | ?? |
| src/ft_strcapitalize.c | ?? |
| src/ft_strcat.c        | ?? |
| src/ft_strchr.c        | ?? |
| src/ft_strchr.c        | ?? |
| src/ft_strclr.c        | ?? |
| src/ft_strcmp.c        | ?? |
| src/ft_strcpy.c        | ?? |
| src/ft_strdel.c        | ?? |
| src/ft_strdup.c        | ?? |
| src/ft_strequ.c        | ?? |
| src/ft_strintab.c      | ?? |

|                                |    |
|--------------------------------|----|
| <code>src/ft_striter.c</code>  | ?? |
| <code>src/ft_striteri.c</code> | ?? |
| <code>src/ft_strjoin.c</code>  | ?? |
| <code>src/ft_strlast.c</code>  | ?? |
| <code>src/ft_strlcat.c</code>  | ?? |
| <code>src/ft_strlcpy.c</code>  | ?? |
| <code>src/ft_strlen.c</code>   | ?? |
| <code>src/ft_strmap.c</code>   | ?? |
| <code>src/ft_strmapi.c</code>  | ?? |
| <code>src/ft_strncat.c</code>  | ?? |
| <code>src/ft_strncmp.c</code>  | ?? |
| <code>src/ft_strncpy.c</code>  | ?? |
| <code>src/ft_strndup.c</code>  | ?? |
| <code>src/ft_strnequ.c</code>  | ?? |
| <code>src/ft_strnew.c</code>   | ?? |
| <code>src/ft_strnstr.c</code>  | ?? |
| <code>src/ft_strrchr.c</code>  | ?? |
| <code>src/ft_strrev.c</code>   | ?? |
| <code>src/ft_strsplit.c</code> | ?? |
| <code>src/ft_strstr.c</code>   | ?? |
| <code>src/ft_strsub.c</code>   | ?? |
| <code>src/ft_strtrim.c</code>  | ?? |
| <code>src/ft_tolower.c</code>  | ?? |
| <code>src/ft_toupper.c</code>  | ?? |

## 4 Data Structure Documentation

### 4.1 s\_list Struct Reference

```
#include <libft.h>
```

#### Data Fields

- void \* [content](#)
- size\_t [content\\_size](#)
- struct [s\\_list](#) \* [next](#)

### 4.1.1 Detailed Description

Represent links of a list.

Definition at line 35 of file libft.h.

### 4.1.2 Field Documentation

#### 4.1.2.1 content `s_list::content`

The data contained in the link. The `void *` allows to store any kind of data.

Definition at line 37 of file libft.h.

Referenced by `ft_lstdel()`, `ft_lstdelone()`, and `ft_lstnew()`.

#### 4.1.2.2 content\_size `s_list::content_size`

The size of the data stored. The `void *` type doesn't allow you to know the size of the pointed data, as a consequence, it is necessary to save its size. For instance, the size of the string "42" is 3 bytes and the 32 bits integer 42 has a size of 4 bytes.

Definition at line 38 of file libft.h.

Referenced by `ft_lstdel()`, `ft_lstdelone()`, and `ft_lstnew()`.

#### 4.1.2.3 next `s_list::next`

The next link's address or `NULL` if it's the last link.

Definition at line 39 of file libft.h.

Referenced by `ft_lstappend()`, `ft_lstdel()`, `ft_lstdelone()`, `ft_lstiter()`, `ft_lstlast()`, `ft_lstmap()`, and `ft_lstnew()`.

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

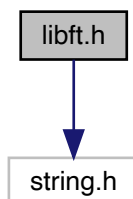
- [libft.h](#)

## 5 File Documentation

### 5.1 libft.h File Reference

```
#include <string.h>
```

Include dependency graph for libft.h:



#### Data Structures

- struct [s\\_list](#)

#### Typedefs

- typedef struct [s\\_list](#) [t\\_list](#)

#### Functions

- int [ft\\_abs](#) (int a)
- int [ft\\_atoi](#) (const char \*str)
- void [ft\\_bzero](#) (void \*s, size\_t n)
- void \* [ft\\_calloc](#) (size\_t count, size\_t size)
- int [ft\\_isalnum](#) (int c)
- int [ft\\_isalpha](#) (int c)
- int [ft\\_isascii](#) (int c)
- int [ft\\_isdigit](#) (int c)
- int [ft\\_isprint](#) (int c)
- int [ft\\_isspace](#) (int c)
- char \* [ft\\_itoa](#) (int n)
- void [ft\\_lstadd](#) (t\_list \*\*alst, t\_list \*new)
- void [ft\\_lstappend](#) (t\_list \*\*alst, t\_list \*new)
- void [ft\\_lstdel](#) (t\_list \*\*alst, void(\*del)(void \*, size\_t))
- void [ft\\_lstdelone](#) (t\_list \*\*alst, void(\*del)(void \*, size\_t))
- void [ft\\_lstiter](#) (t\_list \*lst, void(\*f)(t\_list \*elem))
- t\_list \* [ft\\_lstlast](#) (t\_list \*head)
- t\_list \* [ft\\_lstmap](#) (t\_list \*lst, t\_list \*(\*f)(t\_list \*elem))
- t\_list \* [ft\\_lstnew](#) (void const \*content, size\_t content\_size)
- int [ft\\_max](#) (int a, int b)

- void \* [ft\\_memalloc](#) (size\_t size)
- void \* [ft\\_memccpy](#) (void \*dst, const void \*src, int c, size\_t n)
- void \* [ft\\_memchr](#) (const void \*s, int c, size\_t n)
- int [ft\\_memcmp](#) (const void \*s1, const void \*s2, size\_t n)
- void \* [ft\\_memcpy](#) (void \*dst, const void \*src, size\_t n)
- void [ft\\_memdel](#) (void \*\*ap)
- void \* [ft\\_memmove](#) (void \*dst, const void \*src, size\_t n)
- void \* [ft\\_memset](#) (void \*b, int c, size\_t len)
- int [ft\\_min](#) (int a, int b)
- int [ft\\_power](#) (int num, unsigned int exponent)
- void [ft\\_putchar](#) (char c)
- void [ft\\_putchar\\_fd](#) (char c, int fd)
- void [ft\\_putendl](#) (char const \*s)
- void [ft\\_putendl\\_fd](#) (char const \*s, int fd)
- void [ft\\_putnbr](#) (int n)
- void [ft\\_putnbr\\_fd](#) (int n, int fd)
- void [ft\\_putstr](#) (char \*s, size\_t n)
- void [ft\\_putstr\\_fd](#) (char \*s, size\_t n, int fd)
- void [ft\\_puts](#) (char const \*s)
- void [ft\\_putstr](#) (char const \*s)
- void [ft\\_putstr\\_fd](#) (char const \*s, int fd)
- int [ft\\_sqrt](#) (int num)
- char \* [ft\\_strcapitalize](#) (const char \*str)
- char \* [ft\\_strcat](#) (char \*s1, const char \*s2)
- int [ft\\_strcmp](#) (char const \*str, char c)
- char \* [ft\\_strchr](#) (const char \*s, int c)
- void [ft\\_strclr](#) (char \*s)
- int [ft\\_strcmp](#) (const char \*s1, const char \*s2)
- char \* [ft\\_strcpy](#) (char \*dst, const char \*src)
- void [ft\\_strdel](#) (char \*\*as)
- char \* [ft\\_strdup](#) (const char \*s1)
- int [ft\\_strequ](#) (const char \*s1, const char \*s2)
- int [ft\\_strintab](#) (const char \*str, char \*const tab[])
- void [ft\\_striter](#) (char \*s, void(\*f)(char \*))
- void [ft\\_striteri](#) (char \*s, void(\*f)(unsigned int, char \*))
- char \* [ft\\_strjoin](#) (const char \*s1, const char \*s2)
- char [ft\\_strlast](#) (char const \*str)
- size\_t [ft\\_strlen](#) (char \*dst, const char \*src, size\_t dstsize)
- size\_t [ft\\_strlen](#) (char \*dst, const char \*src, size\_t maxlen)
- size\_t [ft\\_strlen](#) (const char \*s)
- char \* [ft\\_strmap](#) (char const \*s, char(\*f)(char))
- char \* [ft\\_strmap](#) (char const \*s, char(\*f)(unsigned int, char))
- char \* [ft\\_strncat](#) (char \*s1, const char \*s2, size\_t n)
- int [ft\\_strncmp](#) (const char \*s1, const char \*s2, size\_t n)
- char \* [ft\\_strncpy](#) (char \*dst, const char \*src, size\_t len)
- char \* [ft\\_strndup](#) (const char \*s1, size\_t len)
- int [ft\\_strnequ](#) (char const \*s1, char const \*s2, size\_t n)
- char \* [ft\\_strnew](#) (size\_t size)
- char \* [ft\\_strnstr](#) (const char \*haystack, const char \*needle, size\_t len)
- char \* [ft\\_strchr](#) (const char \*s, int c)
- char \* [ft\\_strev](#) (const char \*s)
- char \*\* [ft\\_strsplit](#) (char const \*str, char delim)
- char \* [ft\\_strstr](#) (const char \*haystack, const char \*needle)
- char \* [ft\\_strsub](#) (char const \*s, unsigned int start, size\_t len)
- char \* [ft\\_strtrim](#) (char const \*s)
- int [ft\\_tolower](#) (int c)
- int [ft\\_toupper](#) (int c)



### 5.1.1 Function Documentation

**5.1.1.1 ft\_abs()** `int ft_abs (`  
`int a )`

Returns the absolute value of the argument.

#### Note

This function is only needed, since "The Norme" (the code standard at School 42) forbids the use of parametrized macros.

#### Parameters

|    |   |   |
|----|---|---|
| in | a | The integer to take an absolute value of. |
|----|---|---|

Definition at line 20 of file ft\_abs.c.

```
21 {
22     return (a < 0 ? -a : a);
23 }
```

**5.1.1.2 ft\_atoi()** `int ft_atoi (`  
`const char * str )`

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 20 of file ft\_atoi.c.

```
21 {
22     int i;
23     int num;
24     int is_neg;
25
26     i = 0;
27     is_neg = 0;
28     num = 0;
29     while (str[i] == ' ' || str[i] == '\t' || str[i] == '\n' || str[i] == '\v'
30 || str[i] == '\f' || str[i] == '\r')
31         i++;
32     if (str[i] == '-')
33         is_neg = 1;
34     if (str[i] == '-' || str[i] == '+')
35         i++;
36     while (str[i] >= '0' && str[i] <= '9')
37     {
38         num *= 10;
39         num += (str[i] - '0');
40         i++;
41     }
42     return (is_neg ? -num : num);
43 }
```

**5.1.1.3 ft\_bzero()** void ft\_bzero (  
    void \* s,  
    size\_t n )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_bzero.c.

```
20 {  
21     size_t      i;  
22     unsigned char *s1;  
23  
24     i = 0;  
25     s1 = (unsigned char *)s;  
26     while (i < n)  
27         s1[i++] = 0;  
28 }
```

Referenced by ft\_calloc().

**5.1.1.4 ft\_calloc()** void\* ft\_calloc (  
    size\_t count,  
    size\_t size )

Mimic behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 20 of file ft\_calloc.c.

```
21 {  
22     void      *mem;  
23  
24     mem = malloc(count * size);  
25     if (mem == NULL)  
26         return (NULL);  
27     ft_bzero(mem, count * size);  
28     return (mem);  
29 }
```

References ft\_bzero().

Here is the call graph for this function:



**5.1.1.5 ft\_isalnum()** `int ft_isalnum (`  
`int c )`

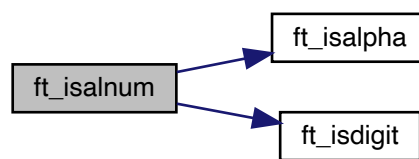
Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_isalnum.c`.

```
20 {  
21     return (ft_isalpha(c) || ft_isdigit(c));  
22 }
```

References `ft_isalpha()`, and `ft_isdigit()`.

Here is the call graph for this function:



**5.1.1.6 ft\_isalpha()** `int ft_isalpha (`  
`int c )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_isalpha.c`.

```
20 {  
21     if (c >= 'a' && c <= 'z')  
22         return (1);  
23     else if (c >= 'A' && c <= 'Z')  
24         return (1);  
25     else  
26         return (0);  
27 }
```

Referenced by `ft_isalnum()`.

**5.1.1.7 ft\_isascii()** `int ft_isascii (`  
`int c )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_isascii.c`.

```
20 {  
21     return (c >= 0 && c <= 127);  
22 }
```

**5.1.1.8 ft\_isdigit()** int ft\_isdigit (  
int c )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_isdigit.c.

```
20 {  
21     if (c >= '0' && c <= '9')  
22         return (1);  
23     else  
24         return (0);  
25 }
```

Referenced by ft\_isalnum().

**5.1.1.9 ft\_isprint()** int ft\_isprint (  
int c )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_isprint.c.

```
20 {  
21     return (c >= 040 && c <= 0176);  
22 }
```

**5.1.1.10 ft\_isspace()** int ft\_isspace (  
int c )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_isspace.c.

```
20 {  
21     return ((c >= 9 && c <= 13) || c == ' ');  
22 }
```

**5.1.1.11 ft\_itoa()** char\* ft\_itoa (  
int n )

Allocate (with malloc) and returns a “fresh” string ending with '\0' representing the integer n given as argument. Negative numbers must be supported. If the allocation fails, the function returns NULL.

#### Parameters

|          |  |
|----------|--|
| <i>n</i> | The integer to be transformed into a string. |
|----------|--|

#### Returns

The string representing the integer passed as argument.

Definition at line 36 of file ft\_itoa.c.

```

37 {
38     char    *str;
39     size_t   len;
40     int      tmp;
41
42     len = ft_int_len(n);
43     tmp = n < 0 ? n : -n;
44     if (n < 0)
45         len++;
46     if (!(str = ft_strnew(len)))
47         return (NULL);
48     while (tmp)
49     {
50         str[--len] = -(tmp % 10) + '0';
51         tmp /= 10;
52     }
53     if (n < 0)
54         str[--len] = '-';
55     return (str);
56 }

```

References `ft_strnew()`.

Here is the call graph for this function:



**5.1.1.12 ft\_lstadd()** void ft\_lstadd (

```

    t_list ** alst,
    t_list * new )

```

Adds the element new at the beginning of the list.

#### Parameters

|             |   |
|-------------|---|
| <i>alst</i> | The address of a pointer to the first link of a list. |
| <i>new</i>  | The link to add at the beginning of the list.         |

Definition at line 21 of file `ft_lstadd.c`.

```

22 {
23     if (!alst || !new)
24         return ;
25     new->next = *alst;
26     *alst = new;
27 }

```

**5.1.1.13 ft\_lstappend()** void ft\_lstappend (

```

    t_list ** alst,
    t_list * new )

```

Adds the element new at the end of the list.

## Parameters

|             |   |
|-------------|---|
| <i>alst</i> | The address of a pointer to the first link of a list. |
| <i>new</i>  | The link to add at the beginning of the list.         |

Definition at line 21 of file ft\_lstappend.c.

```
22 {  
23     t_list    *last;  
24  
25     if (!alst || !new)  
26         return ;  
27     if (!*alst)  
28     {  
29         *alst = new;  
30         return ;  
31     }  
32     last = ft_lstlast(*alst);  
33     last->next = new;  
34 }
```

References `ft_lstlast()`, and `s_list::next`.

Here is the call graph for this function:



**5.1.1.14 ft\_lstdel()** void ft\_lstdel (  
    t\_list \*\* alst,  
    void(\*) (void \*, size\_t) del )

Takes as a parameter the address of a pointer to a link and frees the memory of this link and every successors of that link using the functions `del` and `free`. Finally the pointer to the link that was just freed must be set to `NULL` (quite similar to the function `memdel`).

## Parameters

|             |  |
|-------------|--|
| <i>alst</i> | The address of a pointer to the first link of a list that needs to be freed. |
| <i>del</i>  | The address of a function to apply to each link of a list.                   |

Definition at line 27 of file ft\_lstdel.c.

```
28 {  
29     t_list *head;  
30     t_list *new_head;  
31  
32     if (!alst || !(*alst) || !del)  
33         return ;  
34     head = *alst;  
35     while (head)  
36     {  
37         new_head = head->next;
```

```

38     del(head->content, head->content_size);
39     free(head);
40     head = new_head;
41 }
42 *alst = NULL;
43 }

```

References `s_list::content`, `s_list::content_size`, and `s_list::next`.

**5.1.1.15 ft\_lstdelone()** `void ft_lstdelone (`  
     `t_list ** alst,`  
     `void(*) (void *, size_t) del )`

Takes as a parameter a link's pointer address and frees the memory of the link's content using the function `del` given as a parameter, then frees the link's memory using `free`. The memory of next must not be freed under any circumstance. Finally, the pointer to the link that was just freed must be set to `NULL` (quite similar to the function `memdel`).

#### Parameters

|             |  |
|-------------|--|
| <i>alst</i> | The address of a pointer to a link that needs to be freed. |
| <i>del</i>  | The address of a function to apply to each link of a list. |

Definition at line 27 of file `ft_lstdelone.c`.

```

28 {
29     t_list *link;
30
31     if (!alst || !(*alst) || !del || !(*del))
32         return ;
33     link = *alst;
34     link->next = NULL;
35     del(link->content, link->content_size);
36     free(link);
37     *alst = NULL;
38 }

```

References `s_list::content`, `s_list::content_size`, and `s_list::next`.

**5.1.1.16 ft\_lstiter()** `void ft_lstiter (`  
     `t_list * lst,`  
     `void(*) (t_list *elem) f )`

Iterates the list `lst` and applies the function `f` to each link.

#### Parameters

|            |  |
|------------|--|
| <i>lst</i> | A pointer to the first link of a list.                     |
| <i>f</i>   | The address of a function to apply to each link of a list. |

Definition at line 21 of file `ft_lstiter.c`.

```

22 {
23     if (!f)
24         return ;
25     while (lst)
26     {

```

```

27         f(lst);
28         lst = lst->next;
29     }
30 }

```

References `s_list::next`.

**5.1.1.17 ft\_lstlast()** `t_list*` `ft_lstlast` (  
`t_list * lst` )

Return last element of the list.

Parameters

|            |  |
|------------|--|
| <i>lst</i> | A pointer's to the first link of a list. |
|------------|--|

Returns

The last link of the list.

Definition at line 21 of file `ft_lstlast.c`.

```

22 {
23     if (!lst)
24         return (NULL);
25     while (lst->next)
26         lst = lst->next;
27     return (lst);
28 }

```

References `s_list::next`.

Referenced by `ft_lstappend()`.

**5.1.1.18 ft\_lstmap()** `t_list*` `ft_lstmap` (  
`t_list * lst`,  
`t_list *(*)(t_list *elem) f` )

Iterates a list `lst` and applies the function `f` to each link to create a “fresh” list (using `malloc`) resulting from the successive applications of `f`. If the allocation fails, the function returns `NULL`.

Parameters

|            |  |
|------------|--|
| <i>lst</i> | A pointer's to the first link of a list.                   |
| <i>f</i>   | The address of a function to apply to each link of a list. |

Returns

The new list.



## Remarks

This function fails if `f` returns `NULL`;

Definition at line 26 of file `ft_lstmap.c`.

```

27 {
28     t_list    *new;
29     t_list    *tmp;
30
31     if (!lst)
32         return (NULL);
33     tmp = f(lst);
34     new = tmp;
35     while (lst->next)
36     {
37         lst = lst->next;
38         tmp->next = f(lst);
39         tmp = tmp->next;
40     }
41     return (new);
42 }
```

References `s_list::next`.

**5.1.1.19 ft\_lstnew()** `t_list* ft_lstnew (`  
`void const * content,`  
`size_t content_size )`

Allocates (with `malloc`) and returns a “fresh” link. The variables `content` and `content_size` of the new link are initialized by copy of the parameters of the function. If the parameter `content` is `NULL`, the variable `content` is initialized to `NULL` and the variable `content_size` is initialized to 0 even if the parameter `content_size` isn't. The variable `next` is initialized to `NULL`. If the allocation fails, the function returns `NULL`.

## Parameters

|                     |  |
|---------------------|--|
| <i>content</i>      | The content to put in the new link.      |
| <i>content_size</i> | The size of the content of the new link. |

## Returns

The new link.

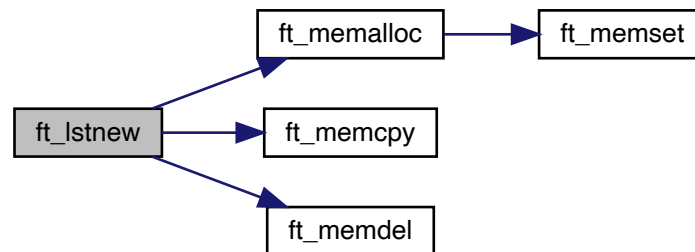
Definition at line 29 of file `ft_lstnew.c`.

```

30 {
31     t_list    *link;
32
33     if (!(link = (t_list *)malloc(sizeof(t_list))))
34         return (NULL);
35     if (content)
36     {
37         if (!(link->content = ft_memalloc(content_size)))
38         {
39             ft_memdel((void **)&link);
40             return (NULL);
41         }
42         ft_memcpy(link->content, content, content_size);
43         link->content_size = content_size;
44     }
45     else
46     {
47         link->content = NULL;
48         link->content_size = 0;
49     }
50     link->next = NULL;
51     return (link);
52 }
```

References `s_list::content`, `s_list::content_size`, `ft_memalloc()`, `ft_memcpy()`, `ft_memdel()`, and `s_list::next`.

Here is the call graph for this function:



**5.1.1.20 ft\_max()** `int ft_max (`  
     `int a,`  
     `int b )`

Returns the maximum of two integer arguments.

#### Note

This function is only needed, since "The Norme" (the code standard at School 42) forbids the use of parametrized macros.

#### Parameters

|    |          |                                |
|----|----------|--------------------------------|
| in | <i>a</i> | The first integer to compare.  |
| in | <i>b</i> | The second integer to compare. |

#### Returns

The larger of the two integers.

Definition at line 22 of file `ft_max.c`.

```

23 {
24     return (a > b ? a : b);
25 }
```

**5.1.1.21 ft\_memalloc()** `void* ft_memalloc (`  
     `size_t size )`

Allocates (with `malloc`) and returns a "fresh" memory area. The memory allocated is initialized to 0. If the allocation fails, the function returns `NULL`.

**Parameters**

|             |  |
|-------------|--|
| <i>size</i> | The size of the memory that needs to be allocated. |
|-------------|--|

**Returns**

The allocated memory area.

Definition at line 24 of file ft\_memalloc.c.

```

25 {
26     char    *mem;
27
28     mem = malloc(size);
29     if (mem == NULL)
30         return (NULL);
31     ft_memset(mem, 0, size);
32     return (mem);
33 }
```

References ft\_memset().

Referenced by ft\_lstnew(), ft\_strnew(), and ft\_strsplit().

Here is the call graph for this function:



**5.1.1.22 ft\_memccpy()** void\* ft\_memccpy (

```

    void * dst,
    const void * src,
    int c,
    size_t n )
```

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_memccpy.c.

```

20 {
21     size_t    i;
22     unsigned char *s1;
23     unsigned char *s2;
24     unsigned char c1;
25
26     s1 = (unsigned char *)dst;
27     s2 = (unsigned char *)src;
28     c1 = (unsigned char)c;
29     i = 0;
30     while (i < n)
31     {
32         s1[i] = s2[i];
33         if (s1[i] == c1)
34             return (s1 + i + 1);
35         i++;
36     }
37     return (NULL);
38 }
```

**5.1.1.23 ft\_memchr()** void\* ft\_memchr (  
    const void \* s,  
    int c,  
    size\_t n )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_memchr.c.

```
20 {  
21     size_t      i;  
22     unsigned char *s1;  
23     unsigned char c1;  
24  
25     i = 0;  
26     s1 = (unsigned char *)s;  
27     c1 = (unsigned char)c;  
28     while (i < n)  
29     {  
30         if (s1[i] == c1)  
31             return (s1 + i);  
32         i++;  
33     }  
34     return (NULL);  
35 }
```

**5.1.1.24 ft\_memcmp()** int ft\_memcmp (  
    const void \* s1,  
    const void \* s2,  
    size\_t n )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_memcmp.c.

```
20 {  
21     unsigned char *str1;  
22     unsigned char *str2;  
23     size_t      i;  
24  
25     i = 0;  
26     str1 = (unsigned char *)s1;  
27     str2 = (unsigned char *)s2;  
28     while (i < n)  
29     {  
30         if (str1[i] - str2[i])  
31             return (str1[i] - str2[i]);  
32         i++;  
33     }  
34     return (0);  
35 }
```

**5.1.1.25 ft\_memcpy()** void\* ft\_memcpy (  
    void \* dst,  
    const void \* src,  
    size\_t n )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_memcpy.c.

```
20 {  
21     size_t      i;  
22     unsigned char *dst1;  
23     unsigned char *src1;  
24  
25     if (!dst && !src)  
26         return (NULL);  
27     i = 0;
```

```
28     dst1 = (unsigned char *)dst;
29     src1 = (unsigned char *)src;
30     while (i < n)
31     {
32         dst1[i] = src1[i];
33         i++;
34     }
35     return (dst);
36 }
```

Referenced by `ft_lstnew()`, and `ft_strlcpy()`.

**5.1.1.26 `ft_memdel()`** `void ft_memdel (`  
    `void ** ap )`

Takes as a parameter the address of a memory area that needs to be freed with `free`, then puts the pointer to `NULL`.

#### Parameters

|                 |  |
|-----------------|--|
| <code>ap</code> | A pointer's address that needs its memory freed and set to <code>NULL</code> . |
|-----------------|--|

Definition at line 22 of file `ft_memdel.c`.

```
23 {
24     if (!ap || !(*ap))
25         return ;
26     free(*ap);
27     *ap = 0;
28 }
```

Referenced by `ft_lstnew()`, and `ft_strdel()`.

**5.1.1.27 `ft_memmove()`** `void* ft_memmove (`  
    `void * dst,`  
    `const void * src,`  
    `size_t n )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_memmove.c`.

```
20 {
21     unsigned char *s1;
22     unsigned char *s2;
23
24     if (!dst && !src)
25         return (NULL);
26     s1 = (unsigned char *)dst;
27     s2 = (unsigned char *)src;
28     while (n > 0)
29     {
30         if (s1 < s2)
31             *(s1++) = *(s2++);
32         else
33             s1[n - 1] = s2[n - 1];
34         n--;
35     }
36     return (dst);
37 }
```

**5.1.1.28 ft\_memset()** void\* ft\_memset (  
    void \* b,  
    int c,  
    size\_t len )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_memset.c.

```
20 {  
21     unsigned char    *s;  
22     unsigned char    cl;  
23  
24     s = (unsigned char *)b;  
25     cl = (unsigned char)c;  
26     while (len-- > 0)  
27     {  
28         *s = cl;  
29         s++;  
30     }  
31     return (b);  
32 }
```

Referenced by ft\_memalloc(), and ft\_strclr().

**5.1.1.29 ft\_min()** int ft\_min (  
    int a,  
    int b )

Returns the minimum of two integer arguments.

#### Note

This function is only needed, since "The Norme" (the code standard at School 42) forbids the use of parametrized macros.

#### Parameters

|    |          |                                |
|----|----------|--------------------------------|
| in | <i>a</i> | The first integer to compare.  |
| in | <i>b</i> | The second integer to compare. |

#### Returns

The smaller of the two integers.

Definition at line 22 of file ft\_min.c.

```
23 {  
24     return (a < b ? a : b);  
25 }
```

**5.1.1.30 ft\_power()** int ft\_power (  
    int num,  
    unsigned int exponent )

Raises a number to a given power.

**Parameters**

|                 |               |
|-----------------|---------------|
| <i>num</i>      | The base.     |
| <i>exponent</i> | The exponent. |

**Returns**

The result or 0 if an integer overflow occurred.

Definition at line 23 of file `ft_power.c`.

```
24 {
25     long long result;
26
27     result = 1;
28     while (exponent-- > 0)
29         result *= num;
30     if (result > INT_MAX)
31         return (0);
32     else
33         return ((int)result);
34 }
```

**5.1.1.31 ft\_putchar()** `void ft_putchar (`  
    `char c )`

Outputs the character `c` to the standard output.

**Parameters**

|          |                          |
|----------|--------------------------|
| <i>c</i> | The character to output. |
|----------|--------------------------|

Definition at line 21 of file `ft_putchar.c`.

```
22 {
23     ft_putchar_fd(c, 1);
24 }
```

References `ft_putchar_fd()`.

Here is the call graph for this function:



**5.1.1.32 ft\_putchar\_fd()** `void ft_putchar_fd (`  
    `char c,`  
    `int fd )`

Outputs the char `c` to the file descriptor `fd`.

## Parameters

|           |                          |
|-----------|--------------------------|
| <i>c</i>  | The character to output. |
| <i>fd</i> | The file descriptor.     |

Definition at line 22 of file `ft_putchar_fd.c`.

```
23 {  
24     write(fd, &c, 1);  
25 }
```

Referenced by `ft_putchar()`, `ft_putendl_fd()`, and `ft_putnbr_fd()`.

**5.1.1.33 ft\_putendl()** `void ft_putendl (`  
    `char const * s )`

Outputs the string `s` to the standard output followed by a `' \n '`.

## Parameters

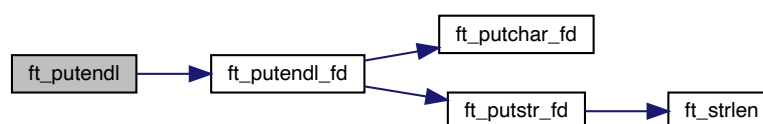
|          |                       |
|----------|-----------------------|
| <i>s</i> | The string to output. |
|----------|-----------------------|

Definition at line 20 of file `ft_putendl.c`.

```
21 {  
22     ft_putendl_fd(s, 1);  
23 }
```

References `ft_putendl_fd()`.

Here is the call graph for this function:



**5.1.1.34 ft\_putendl\_fd()** `void ft_putendl_fd (`  
    `char const * s,`  
    `int fd )`

Outputs the string `s` to the file descriptor `fd` followed by a `' \n '`.

## Parameters

|           |                       |
|-----------|-----------------------|
| <i>s</i>  | The string to output. |
| <i>fd</i> | The file descriptor.  |



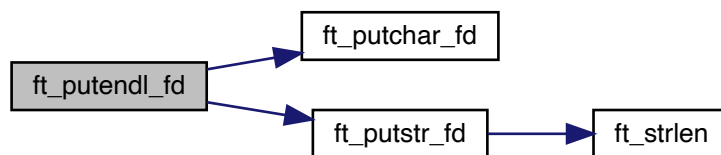
Definition at line 21 of file ft\_putendl\_fd.c.

```
22 {  
23     ft_putstr_fd(s, fd);  
24     ft_putchar_fd('\n', fd);  
25 }
```

References ft\_putchar\_fd(), and ft\_putstr\_fd().

Referenced by ft\_putendl().

Here is the call graph for this function:



**5.1.1.35 ft\_putnbr()** void ft\_putnbr (  
int n )

Outputs the integer n to the standard output.

#### Parameters

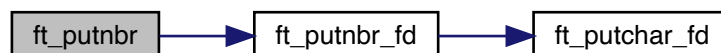
|          |                        |
|----------|------------------------|
| <i>n</i> | The integer to output. |
|----------|------------------------|

Definition at line 20 of file ft\_putnbr.c.

```
21 {  
22     ft_putnbr_fd(n, 1);  
23 }
```

References ft\_putnbr\_fd().

Here is the call graph for this function:



**5.1.1.36 ft\_putnbr\_fd()** void ft\_putnbr\_fd (  
    int *n*,  
    int *fd* )

Outputs the integer *n* to the file descriptor *fd*.

#### Parameters

|           |                       |
|-----------|-----------------------|
| <i>n</i>  | The integer to print. |
| <i>fd</i> | The file descriptor.  |

Definition at line 22 of file ft\_putnbr\_fd.c.

```
23 {  
24     if (n == INT_MIN)  
25     {  
26         ft_putnbr_fd(n / 10, fd);  
27         ft_putnbr_fd(-(n % 10), fd);  
28     }  
29     else if (n < 0)  
30     {  
31         ft_putchar_fd('-', fd);  
32         ft_putnbr_fd(-n, fd);  
33     }  
34     else if (n > 9)  
35     {  
36         ft_putnbr_fd(n / 10, fd);  
37         ft_putchar_fd(n % 10 + '0', fd);  
38     }  
39     else  
40         ft_putchar_fd(n % 10 + '0', fd);  
41 }
```

References ft\_putchar\_fd().

Referenced by ft\_putnbr().

Here is the call graph for this function:



**5.1.1.37 ft\_putstr()** void ft\_putstr (  
    char \* *s*,  
    size\_t *n* )

Outputs the first *n* characters of the string *s* to the standard output.

#### Parameters

|          |  |
|----------|--|
| <i>s</i> | The string, the characters of which to output. |
| <i>n</i> | The number of characters to output.            |

**Remarks**

If `s` contains less than `n` characters, behaviour is undefined.

Definition at line 23 of file `ft_putnstr.c`.

```
24 {  
25     write(1, s, n);  
26 }
```

**5.1.1.38 ft\_putnstr\_fd()** `void ft_putnstr_fd (`  
    `char * s,`  
    `size_t n,`  
    `int fd )`

Outputs the first `n` characters of the string `s` to the file descriptor `fd`.

**Parameters**

|                 |  |
|-----------------|--|
| <code>s</code>  | The string, the characters of which to output. |
| <code>n</code>  | The number of characters to output.            |
| <code>fd</code> | The file descriptor.                           |

**Remarks**

If `s` contains less than `n` characters, behaviour is undefined.

Definition at line 24 of file `ft_putnstr_fd.c`.

```
25 {  
26     write(fd, s, n);  
27 }
```

**5.1.1.39 ft\_puts()** `void ft_puts (`  
    `const char * s )`

Replicates behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_puts.c`.

```
20 {  
21     return (write(1, s, ft_strlen(s)));  
22 }
```

References `ft_strlen()`.

Here is the call graph for this function:



**5.1.1.40 ft\_putstr()** void ft\_putstr (  
char const \* s )

Outputs the string *s* to the standard output.

#### Parameters

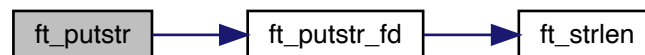
|          |                       |
|----------|-----------------------|
| <i>s</i> | The string to output. |
|----------|-----------------------|

Definition at line 21 of file ft\_putstr.c.

```
22 {  
23     ft_putstr_fd(s, 1);  
24 }
```

References ft\_putstr\_fd().

Here is the call graph for this function:



**5.1.1.41 ft\_putstr\_fd()** void ft\_putstr\_fd (  
char const \* s,  
int fd )

Outputs the string *s* to the file descriptor *fd*.

#### Parameters

|           |                       |
|-----------|-----------------------|
| <i>s</i>  | The string to output. |
| <i>fd</i> | The file descriptor.  |

Definition at line 22 of file ft\_putstr\_fd.c.

```
23 {  
24     write(fd, s, ft_strlen(s));  
25 }
```

References ft\_strlen().

Referenced by ft\_putendl\_fd(), and ft\_putstr().

Here is the call graph for this function:



**5.1.1.42 ft\_sqrt()** `int ft_sqrt (`  
    `int num )`

Computes an integer square root of a given number.

**Parameters**

|            |  |
|------------|--|
| <i>num</i> | The number of which to take a square root. |
|------------|--|

**Returns**

The integer square root, or `-1` if it doesn't exit.

Definition at line 19 of file `ft_sqrt.c`.

```
20 {
21     int factor;
22
23     if (num < 0 ||
24         (num % 2 == 0 && num % 4 != 0) ||
25         (num % 3 == 0 && num % 9 != 0))
26         return (-1);
27     factor = (num % 2) ? 1 : 0;
28     while (factor < num / 2)
29     {
30         if (factor * factor == num)
31             return (factor);
32         factor += 2;
33     }
34     return (-1);
35 }
```

**5.1.1.43 ft\_strcapitalize()** `char* ft_strcapitalize (`  
    `const char * s1 )`

Capitalizes all words (defined as stretches of alpha-numeric characters) in a `NULL`-terminated string and writes them to a newly allocated string.

Example: `ft_strcapitalize("My word IS 42about%8THEM")` returns `"My Word Is 42about%8them"`

**Parameters**

|           |                           |
|-----------|---------------------------|
| <i>s1</i> | The string to capitalize. |
|-----------|---------------------------|

**Returns**

A duplicate of `str` in which all words have been capitalized. If `str` is a `NULL` pointer or allocation fails, `NULL` is returned.

Definition at line 49 of file `ft_strcapitalize.c`.

```
50 {
51     char    *s2;
52
53     if (!s1 || !(s2 = ft_strdup(s1)))
54         return (0);
55     while (scroll_to_word(&s2))
56         capitalize_word(&s2);
57     return (s2);
58 }
```

References `ft_strdup()`.

Here is the call graph for this function:



**5.1.1.44 ft\_strcat()** `char* ft_strcat (`  
     `char * s1,`  
     `const char * s2 )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strcat.c`.

```
20 {
21     size_t i;
22     size_t len;
23
24     len = ft_strlen(s1);
25     i = 0;
26     while (s2[i])
27     {
28         s1[len + i] = s2[i];
29         i++;
30     }
31     s1[len + i] = '\0';
32     return (s1);
33 }
```

References `ft_strlen()`.

Referenced by `ft_strjoin()`.

Here is the call graph for this function:



**5.1.1.45 ft\_strcchr()** int ft\_strcchr (  
    char const \* str,  
    char c )

Count the number of occurrences of a character in a string.

#### Parameters

|            |                                    |
|------------|------------------------------------|
| <i>str</i> | The string in which to search.     |
| <i>c</i>   | The character for which to search. |

#### Returns

The number of occurrences.

Definition at line 22 of file ft\_strcchr.c.

```
23 {  
24     int count;  
25  
26     count = 0;  
27     if (!str || !c)  
28         return (-1);  
29     while (*str)  
30     {  
31         if (*str == c)  
32             count++;  
33         str++;  
34     }  
35     return (count);  
36 }
```

**5.1.1.46 ft\_strchr()** char\* ft\_strchr (  
    const char \* s,  
    int c )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strchr.c.

```
20 {  
21     size_t i;  
22  
23     i = 0;  
24     while (s[i])  
25     {  
26         if (s[i] == c)  
27             return ((char *) (s + i));  
28         i++;  
29     }  
30     if (c == 0)  
31         return ((char *) (s + i));  
32     else  
33         return (NULL);  
34 }
```

**5.1.1.47 ft\_strclr()** void ft\_strclr (  
    char \* s )

Sets every character of the string to the value '\0'.

## Parameters

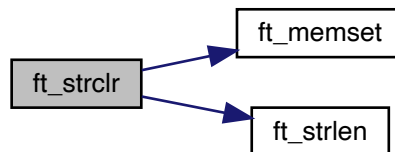
|   |                                      |
|---|--------------------------------------|
| s | The string that needs to be cleared. |
|---|--------------------------------------|

Definition at line 20 of file ft\_strclr.c.

```
21 {  
22     if (!s)  
23         return ;  
24     ft_memset(s, 0, ft_strlen(s));  
25 }
```

References `ft_memset()`, and `ft_strlen()`.

Here is the call graph for this function:



**5.1.1.48 ft\_strcmp()** int ft\_strcmp (  
    const char \* s1,  
    const char \* s2 )

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file ft\_strcmp.c.

```
20 {  
21     unsigned char *s1u;  
22     unsigned char *s2u;  
23  
24     s1u = (unsigned char *)s1;  
25     s2u = (unsigned char *)s2;  
26     while (*s1u || *s2u)  
27     {  
28         if (*s1u - *s2u)  
29             return (*s1u - *s2u);  
30         s1u++;  
31         s2u++;  
32     }  
33     return (0);  
34 }
```



**5.1.1.49 ft\_strcpy()** `char* ft_strcpy (`  
    `char * dst,`  
    `const char * src )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strcpy.c`.

```
20 {
21     size_t i;
22
23     i = 0;
24     while (src[i])
25     {
26         dst[i] = src[i];
27         i++;
28     }
29     dst[i] = 0;
30     return (dst);
31 }
```

Referenced by `ft_strjoin()`.

**5.1.1.50 ft\_strdel()** `void ft_strdel (`  
    `char ** as )`

Takes as a parameter the address of a string that need to be freed with `free`, then sets its pointer to `NULL`.

#### Parameters

|    |  |
|----|--|
| as | The string's address that needs to be freed and its pointer set to <code>NULL</code> . |
|----|--|

Definition at line 22 of file `ft_strdel.c`.

```
23 {
24     ft_memdel((void **)as);
25 }
```

References `ft_memdel()`.

Here is the call graph for this function:



**5.1.1.51 ft\_strdup()** `char* ft_strdup (`  
    `const char * s1 )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file ft\_strdup.c.

```

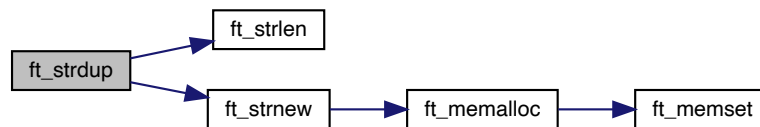
20 {
21     size_t  i;
22     char    *cpy;
23
24     if (!(cpy = ft_strnew(ft_strlen(s1))))
25         return (NULL);
26     i = 0;
27     while (s1[i])
28     {
29         cpy[i] = s1[i];
30         i++;
31     }
32     cpy[i] = 0;
33     return (cpy);
34 }

```

References `ft_strlen()`, and `ft_strnew()`.

Referenced by `ft_strcapitalize()`, `ft_strmap()`, `ft_strmapi()`, and `ft_strtrim()`.

Here is the call graph for this function:



**5.1.1.52 ft\_strequ()** `int ft_strequ (const char * s1, const char * s2 )`

Lexicographical comparison between `s1` and `s2` up to `n` characters or until a `'\0'` is reached. If the 2 strings are identical, the function returns 1, or 0 otherwise.

#### Parameters

|                 |                                   |
|-----------------|-----------------------------------|
| <code>s1</code> | The first string to be compared.  |
| <code>s2</code> | The second string to be compared. |

#### Returns

1 or 0 according to if the 2 strings are identical or not.

Definition at line 24 of file ft\_strequ.c.

```

25 {
26     if (!s1 && !s2)
27         return (1);
28     else if (!s1 || !s2)
29         return (0);
30     while (*s1 || *s2)
31     {
32         if (*s1 != *s2)

```

```

33         return (0);
34     s1++;
35     s2++;
36 }
37 return (1);
38 }

```

Referenced by `ft_strintab()`.

**5.1.1.53 ft\_strintab()** `int ft_strintab (`  
`const char * str,`  
`char *const tab[] )`

Perform lexicographical comparison between a given string and strings contained in a NULL-terminated tab. If the tab contains an identical string, the function returns 1, or 0 otherwise.

#### Parameters

|            |                                       |
|------------|---------------------------------------|
| <i>str</i> | The string to search for.             |
| <i>tab</i> | The NULL-terminated tab to search in. |

#### Returns

1 or 0 depending on whether the tab contains an identical string.

Definition at line 25 of file `ft_strintab.c`.

```

26 {
27     while (*tab)
28     {
29         if (ft_strequ(str, *tab))
30             return (1);
31         tab++;
32     }
33     return (0);
34 }

```

References `ft_strequ()`.

Here is the call graph for this function:



**5.1.1.54 ft\_striter()** `void ft_striter (`  
`char * s,`  
`void(*) (char *) f )`

Applies the function `f` to each character of the string passed as argument. Each character is passed by address to `f` to be modified if necessary.

## Parameters

|          |   |
|----------|---|
| <i>s</i> | The string to iterate.                                |
| <i>f</i> | The function to apply to each character of <i>s</i> . |

Definition at line 22 of file ft\_striter.c.

```
23 {  
24     if (!s || !f)  
25         return ;  
26     while (*s)  
27         f(s++);  
28 }
```

**5.1.1.55 ft\_striteri()** void ft\_striteri (  
char \* *s*,  
void(\*) (unsigned int, char \*) *f* )

Applies the function *f* to each character of the string passed as argument, and passing its index as first argument. Each character is passed by address to *f* to be modified if necessary.

## Parameters

|          |  |
|----------|--|
| <i>s</i> | The string to iterate.   |
| <i>f</i> | The function to apply to each character of <i>s</i> and its index. |

Definition at line 23 of file ft\_striteri.c.

```
24 {  
25     size_t i;  
26  
27     if (!s || !f)  
28         return ;  
29     i = 0;  
30     while (*s)  
31         f(i++, s++);  
32 }
```

**5.1.1.56 ft\_strjoin()** char\* ft\_strjoin (  
const char \* *s1*,  
const char \* *s2* )

Allocates (with `malloc`) and returns a “fresh” string ending with `'\0'`, result of the concatenation of *s1* and *s2*. If the allocation fails the function returns `NULL`.

## Parameters

|           |                    |
|-----------|--------------------|
| <i>s1</i> | The prefix string. |
| <i>s2</i> | The suffix string. |

## Returns

The “fresh” string result of the concatenation of the 2 strings.

Definition at line 24 of file ft\_strjoin.c.

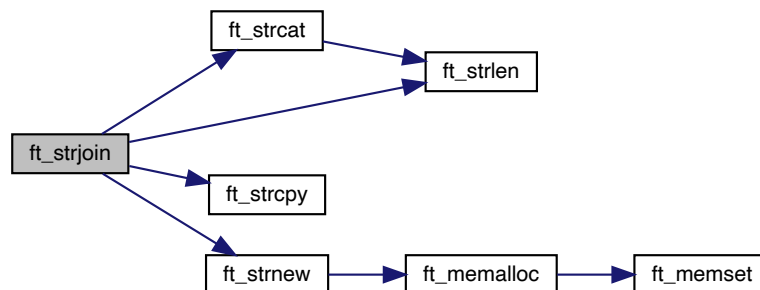
```

25 {
26     char    *s_joined;
27
28     if (!s1 && !s2)
29         return (NULL);
30     else if (!s1)
31         return (char *)s2;
32     else if (!s2)
33         return (char *)s1;
34     if (!(s_joined = ft_strnew(ft_strlen(s1) + ft_strlen(s2))))
35         return (NULL);
36     s_joined = ft_strcpy(s_joined, s1);
37     s_joined = ft_strcat(s_joined, s2);
38     return (s_joined);
39 }

```

References ft\_strcat(), ft\_strcpy(), ft\_strlen(), and ft\_strnew().

Here is the call graph for this function:



**5.1.1.57 ft\_strlast()** `char ft_strlast (char const * str)`

Returns the last characters (excluding `NULL`-termination) of a string.

#### Parameters

|            |             |
|------------|-------------|
| <i>str</i> | The string. |
|------------|-------------|

#### Returns

The last character of the string, or 0 if it is empty.

Definition at line 21 of file ft\_strlast.c.

```

22 {
23     size_t i;
24
25     i = 0;
26     while (str[i + 1])
27         i++;
28     return (str[i]);
29 }

```

**5.1.1.58 ft\_strlcat()** size\_t ft\_strlcat (  
    char \* dst,  
    const char \* src,  
    size\_t dstsize )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strlcat.c.

```
20 {  
21     size_t  dstlen;  
22     size_t  srclen;  
23     size_t  i;  
24  
25     dstlen = ft_strlen(dst);  
26     srclen = ft_strlen(src);  
27     if (dstlen >= dstsize)  
28         return (srclen + dstsize);  
29     i = 0;  
30     while (i < dstsize - dstlen - 1 && src[i])  
31     {  
32         dst[dstlen + i] = src[i];  
33         i++;  
34     }  
35     dst[dstlen + i] = '\0';  
36     return (srclen + dstlen);  
37 }
```

References ft\_strlen().

Here is the call graph for this function:



**5.1.1.59 ft\_strlcpy()** size\_t ft\_strlcpy (  
    char \* dst,  
    const char \* src,  
    size\_t maxlen )

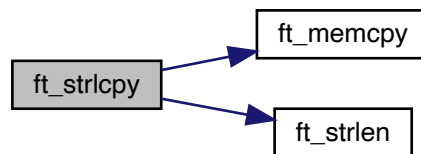
Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strlcpy.c.

```
20 {  
21     size_t srclen;  
22  
23     srclen = ft_strlen(src);  
24     if (srclen + 1 < maxlen)  
25     {  
26         ft_memcpy(dst, src, srclen + 1);  
27     }  
28     else if (maxlen != 0)  
29     {  
30         ft_memcpy(dst, src, maxlen - 1);  
31         dst[maxlen - 1] = '\0';  
32     }  
33     return (srclen);  
34 }
```

References `ft_memcpy()`, and `ft_strlen()`.

Here is the call graph for this function:



**5.1.1.60 ft\_strlen()** `size_t ft_strlen (`  
`const char * s )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strlen.c`.

```

20 {
21     size_t i;
22
23     i = 0;
24     while (s[i])
25         i++;
26     return (i);
27 }
  
```

Referenced by `ft_puts()`, `ft_putstr_fd()`, `ft_strcat()`, `ft_strclr()`, `ft_strdup()`, `ft_strjoin()`, `ft_strlcat()`, `ft_strlcpy()`, `ft_strncat()`, `ft_strrev()`, and `ft_strtrim()`.

**5.1.1.61 ft\_strmap()** `char* ft_strmap (`  
`char const * s,`  
`char (*) (char) f )`

Applies the function `f` to each character of the string given as argument to create a “fresh” new string (with `malloc`) resulting from the successive applications of `f`.

#### Parameters

|                |   |
|----------------|---|
| <code>s</code> | The string to map.  |
| <code>f</code> | The function to apply to each character of <code>s</code> . |

#### Returns

The “fresh” string created from the successive applications of `f`.

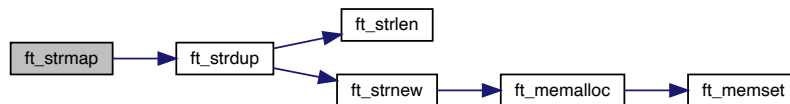
Definition at line 24 of file ft\_strmap.c.

```

25 {
26     char    *s_new;
27     size_t   i;
28
29     if (!s || !f)
30         return (NULL);
31     s_new = ft_strdup(s);
32     if (!s_new)
33         return (NULL);
34     i = 0;
35     while (s[i])
36     {
37         s_new[i] = f(s[i]);
38         i++;
39     }
40     return (s_new);
41 }
```

References `ft_strdup()`.

Here is the call graph for this function:



**5.1.1.62 ft\_strmap()** `char* ft_strmap (`  
`char const * s,`  
`char(*) (unsigned int, char) f )`

Applies the function `f` to each character of the string passed as argument by giving its index as first argument to create a “fresh” new string (with `malloc`) resulting from the successive applications of `f`.

#### Parameters

|          |   |
|----------|---|
| <i>s</i> | The string to map.  |
| <i>f</i> | The function to apply to each character and its index of <i>s</i> . |

#### Returns

The “fresh” string created from the successive applications of `f`.

Definition at line 25 of file ft\_strmap.c.

```

26 {
27     char    *s_new;
28     size_t   i;
29
30     if (!s || !f)
31         return (NULL);
32     s_new = ft_strdup(s);
33     if (!s_new)
34         return (NULL);
35     i = 0;
36     while (s[i])
37     {
```



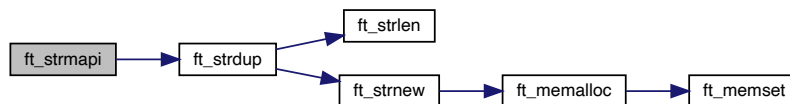
```

38         s_new[i] = f(i, s[i]);
39         i++;
40     }
41     return (s_new);
42 }

```

References `ft_strdup()`.

Here is the call graph for this function:



**5.1.1.63 ft\_strncat()** `char* ft_strncat (`  
`char * s1,`  
`const char * s2,`  
`size_t n )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strncat.c`.

```

20 {
21     size_t i;
22     size_t len;
23
24     i = 0;
25     len = ft_strlen(s1);
26     while (i < n && s2[i])
27     {
28         s1[len + i] = s2[i];
29         i++;
30     }
31     s1[len + i] = 0;
32     return (s1);
33 }

```

References `ft_strlen()`.

Here is the call graph for this function:



**5.1.1.64 ft\_strncmp()** int ft\_strncmp (
   
const char \* s1,
   
const char \* s2,
   
size\_t n )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strncmp.c.

```

20 {
21     unsigned char *s1u;
22     unsigned char *s2u;
23
24     s1u = (unsigned char *)s1;
25     s2u = (unsigned char *)s2;
26     while ((*s1u || *s2u) && n-- > 0)
27     {
28         if (*s1u - *s2u)
29             return (*s1u - *s2u);
30         s1u++;
31         s2u++;
32     }
33     return (0);
34 }
```

**5.1.1.65 ft\_strncpy()** char\* ft\_strncpy (
   
char \* dst,
   
const char \* src,
   
size\_t len )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strncpy.c.

```

20 {
21     size_t i;
22
23     i = 0;
24     while (i < len && src[i])
25     {
26         dst[i] = src[i];
27         i++;
28     }
29     while (i < len)
30     {
31         dst[i] = '\0';
32         i++;
33     }
34     return (dst);
35 }
```

Referenced by ft\_strsub().

**5.1.1.66 ft\_strndup()** char\* ft\_strndup (
   
const char \* s1,
   
size\_t len )

Allocate sufficient memory for a string of len characters, do the copy of len characters, NULL terminate the string, and return a pointer to it. The pointer may subsequently be used as an argument to the function free.

#### Parameters

|            |                               |
|------------|-------------------------------|
| <i>s1</i>  | String to be copied from.     |
| <i>len</i> | Number of characters to copy. |

**Returns**

String of length `len` with copied characters.

**Remarks**

If `s1` contains less than `len` characters, behaviour is undefined.

Definition at line 27 of file `ft_strndup.c`.

```

28 {
29     size_t i;
30     char *cpy;
31
32     if (!(cpy = (char *)malloc(sizeof(char) * (len + 1))))
33         return (NULL);
34     i = 0;
35     while (i < len)
36     {
37         cpy[i] = s1[i];
38         i++;
39     }
40     cpy[i] = '\0';
41     return (cpy);
42 }
```

Referenced by `ft_strsplit()`.

**5.1.1.67 ft\_strnequ()** `int ft_strnequ (`  
`char const * s1,`  
`char const * s2,`  
`size_t n )`

Lexicographical comparison between `s1` and `s2` up to `n` characters or until a `'\0'` is reached. If the 2 strings are identical, the function returns 1, or 0 otherwise.

**Parameters**

|                 |  |
|-----------------|--|
| <code>s1</code> | The first string to be compared.                 |
| <code>s2</code> | The second string to be compared.                |
| <code>n</code>  | The maximum number of characters to be compared. |

**Returns**

1 or 0 according to if the 2 strings are identical or not.

Definition at line 25 of file `ft_strnequ.c`.

```

26 {
27     if (!s1 && !s2)
28         return (1);
29     else if (!s1 || !s2)
30         return (0);
31     while ((*s1 || *s2) && n-- > 0)
32     {
33         if (*s1 != *s2)
34             return (0);
35         s1++;
36         s2++;
37     }
38     return (1);
39 }
```

**5.1.1.68 ft\_strnew()** `char* ft_strnew (`  
`size_t size )`

Allocates (with `malloc`) and returns a “fresh” string ending with `'\0'`. Each character of the string is initialized at `'\0'`. If the allocation fails the function returns `NULL`.

#### Parameters

|             |   |
|-------------|---|
| <i>size</i> | The size of the string to be allocated. |
|-------------|---|

#### Returns

The string allocated and initialized to 0.

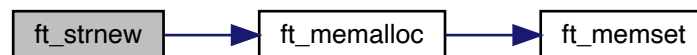
Definition at line 23 of file `ft_strnew.c`.

```
24 {
25     if (size + 1 < size)
26         return (NULL);
27     return (ft_memalloc(sizeof(char) * (size + 1)));
28 }
```

References `ft_memalloc()`.

Referenced by `ft_itoa()`, `ft_strdup()`, `ft_strjoin()`, `ft_strrev()`, and `ft_strsub()`.

Here is the call graph for this function:



**5.1.1.69 ft\_strnstr()** `char* ft_strnstr (`  
`const char * haystack,`  
`const char * needle,`  
`size_t len )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strnstr.c`.

```
20 {
21     size_t i;
22     size_t j;
23
24     i = 0;
25     if (*needle == '\0')
26         return ((char *)haystack);
27     while (haystack[i] && i < len)
28     {
29         if (haystack[i] == needle[0])
30         {
31             j = 0;
32             while (needle[j] &&
```

```
33             i + j < len &&
34             haystack[i + j] == needle[j])
35         j++;
36         if (needle[j] == 0)
37             return ((char *) (haystack + i));
38     }
39     i++;
40 }
41 return (NULL);
42 }
```

**5.1.1.70 ft\_strchr()** char\* ft\_strchr (  
const char \* s,  
int c )

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_strchr.c.

```
20 {
21     size_t i;
22     size_t last;
23     int found;
24
25     i = 0;
26     last = 0;
27     found = 0;
28     while (s[i])
29     {
30         if (s[i] == c)
31         {
32             last = i;
33             found = 1;
34         }
35         i++;
36     }
37     if (found)
38         return ((char *) (s + last));
39     else if (c == 0)
40         return ((char *) (s + i));
41     else
42         return (NULL);
43 }
```

**5.1.1.71 ft\_strrev()** char\* ft\_strrev (  
const char \* s )

Allocates (with malloc) and returns a “reversed” NULL-terminated string or NULL if allocation fails.

Example: ft\_strrev("0123456789") returns "9876543210"

#### Parameters

|   |                        |
|---|------------------------|
| s | String to be reversed. |
|---|------------------------|

#### Returns

Reversed string.

Definition at line 24 of file ft\_strrev.c.

```
25 {
26     size_t len;
```

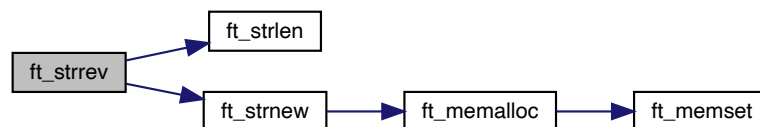
```

27     size_t  i;
28     char    *srev;
29
30     if (!s)
31         return (NULL);
32     len = ft_strlen(s);
33     if (!(srev = ft_strnew(len)))
34         return (NULL);
35     i = 0;
36     while (i < len)
37     {
38         srev[i] = s[len - i - 1];
39         i++;
40     }
41     return (srev);
42 }

```

References `ft_strlen()`, and `ft_strnew()`.

Here is the call graph for this function:



**5.1.1.72 ft\_strsplit()** `char** ft_strsplit (`  
`char const * s,`  
`char delim )`

Allocates (with `malloc`) and returns an array of “fresh” strings (all ending with `'\0'`, including the array itself) obtained by splitting `s` using the character `c` as a delimiter. If the allocation fails the function returns `NULL`.

Example : `ft_strsplit("hello*fellow***students*", '*')` returns the array `["hello", "fellow", "students"]`.

#### Parameters

|              |                          |
|--------------|--------------------------|
| <i>s</i>     | The string to split.     |
| <i>delim</i> | The delimiter character. |

#### Returns

The array of “fresh” strings result of the split.

Definition at line 69 of file `ft_strsplit.c`.

```

70 {
71     char    **tab;
72     const char *start;
73     const char *end;
74     size_t  wcount;
75     size_t  i;
76

```

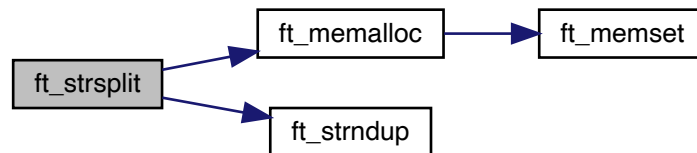
```

77     wcount = count_words(s, delim);
78     if (!(tab = ft_memalloc(sizeof(char *) * (wcount + 1))))
79         return (NULL);
80     i = 0;
81     end = s;
82     while (i < wcount)
83     {
84         start = search_not_delim(end, delim);
85         end = search_delim(start, delim);
86         if (!(tab[i] = ft_strndup(start, end - start)))
87         {
88             free_tab(tab);
89             return (NULL);
90         }
91         i++;
92     }
93     tab[i++] = NULL;
94     return (tab);
95 }

```

References `ft_memalloc()`, and `ft_strndup()`.

Here is the call graph for this function:



**5.1.1.73 ft\_strstr()** `char* ft_strstr (`  
     `const char * haystack,`  
     `const char * needle )`

Replicate behaviour of a function of the same name (sans `ft_`) from `libc`.

Definition at line 19 of file `ft_strstr.c`.

```

20 {
21     size_t i;
22     size_t j;
23
24     i = 0;
25     if (*needle == 0)
26         return ((char *)haystack);
27     while (haystack[i])
28     {
29         if (haystack[i] == needle[0])
30         {
31             j = 0;
32             while (needle[j] && haystack[i + j] == needle[j])
33                 j++;
34             if (needle[j] == 0)
35                 return ((char *) (haystack + i));
36         }
37         i++;
38     }
39     return (NULL);
40 }

```

**5.1.1.74 ft\_strsub()** `char* ft_strsub (`  
`char const * s,`  
`unsigned int start,`  
`size_t len )`

Allocates (with `malloc`) and returns a “fresh” substring from the string given as argument. The substring begins at index `start` and is of size `len`. If `start` and `len` aren’t referring to a valid substring, the behavior is undefined. If the allocation fails, the function returns `NULL`.

#### Parameters

|              |   |
|--------------|---|
| <i>s</i>     | The string from which create the substring. |
| <i>start</i> | The start index of the substring.           |
| <i>len</i>   | The size of the substring.                  |

#### Returns

The substring.

Definition at line 27 of file `ft_strsub.c`.

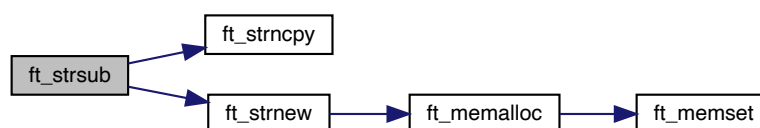
```

28 {
29     char    *sub;
30
31     if (!s ||
32         !(sub = ft_strnew(len)))
33         return (NULL);
34     ft_strncpy(sub, s + start, len);
35     return (sub);
36 }
```

References `ft_strncpy()`, and `ft_strnew()`.

Referenced by `ft_strtrim()`.

Here is the call graph for this function:



**5.1.1.75 ft\_strtrim()** `char* ft_strtrim (`  
`char const * s )`

Allocates (with `malloc`) and returns a copy of the string given as argument without whitespaces at the beginning or at the end of the string. Will be considered as whitespaces the following characters ' ', '\n' and '\t'. If `s` has no whitespaces at the beginning or at the end, the function returns a copy of `s`. If the allocation fails the function returns `NULL`.



## Parameters

|   |                           |
|---|---------------------------|
| s | The string to be trimmed. |
|---|---------------------------|

## Returns

The “fresh” trimmed string or a copy of s.

Definition at line 31 of file ft\_strtrim.c.

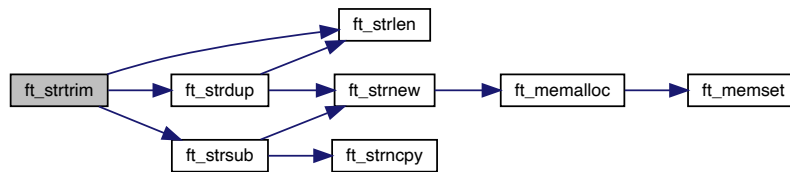
```

32 {
33     size_t i;
34     size_t j;
35
36     i = 0;
37     while (is_trimmable(s[i]))
38         i++;
39     if (s[i] == '\0')
40         return (ft_strdup(""));
41     j = ft_strlen(s) - 1;
42     while (is_trimmable(s[j]))
43         j--;
44     return (ft_strsub(s, i, j - i + 1));
45 }

```

References ft\_strdup(), ft\_strlen(), and ft\_strsub().

Here is the call graph for this function:



**5.1.1.76 ft\_tolower()** int ft\_tolower (int c)

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_tolower.c.

```

20 {
21     if (c >= 'A' && c <= 'Z')
22         return (c + 'a' - 'A');
23     else
24         return (c);
25 }

```

**5.1.1.77 ft\_toupper()** int ft\_toupper (int c)

Replicate behaviour of a function of the same name (sans ft\_) from libc.

Definition at line 19 of file ft\_toupper.c.

```

20 {
21     if (c >= 'a' && c <= 'z')
22         return (c + 'A' - 'a');
23     else
24         return (c);
25 }

```

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