

minishell

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Chapter 1

Minishell

1.1 Introduction

Welcome to the documentation of the Minishell project for EICNAM 2025.

1.2 Features

- [Command](#) parsing and execution
- [Alias](#) management
- Batch mode
- [Command history](#)
- Internal commands (cd, pwd, echo, etc.)

1.3 Usage

See the README for usage instructions.

Chapter 2

Projet - Minishell

2.1 À propos

Ce projet, toujours réalisé dans le cadre de notre module de systèmes avancés, est une version plus légère d'un shell, appelé minishell. Il réponds à la plupart des exigences techniques demandées dans le sujet, celles-ci étant expliquées ci-dessous (lien vers le sujet à l'appui).

2.2 Compilation du projet

Le projet se compile avec le fichier Makefile situé dans le même dossier, à l'aide de la commande `make`. Le fichier exécutable "minishell" se trouvera alors dans le sous-dossier `output/`, prêt à l'emploi.

2.3 Documentation

- [Documentation générée par doxygen **A REMPLIR QUAND ON AURA LES DONNEES**()]
- [PDF généré par doxygen](#)
- [Sujet du projet](#)
- [Page de manuel linux](#)

2.4 Exigences techniques auxquelles nous avons répondu

2.4.1 Capacité d'exécuter des commandes simples

Le minishell réalisé permet l'exécution de commandes simples.

Exemples :

- `ls -a`
- `ps`
- `ls -alF > file.txt`
- `ps aux | grep minishell`

2.4.2 Capacité d'exécuter un sous-ensemble de plusieurs commandes

La logique de différents opérateurs a été recréé, permettant l'accès aux :

- Opérateurs de contrôle
 - Le ET logique: &&
 - Le OU logique: ||
- Opérateurs de redirection de flux simples :
 - Le pipe: |
 - Les chevrons: < et >
 - Les chevrons doubles: << et >>
- Exécutions en arrière-plan
 - Symbole &

2.4.3 L'exécution built-in de certaines commandes

La logique des commandes suivantes a été réécrite :

- cd
- pwd
- exit
- echo

2.4.4 Le maintien d'un historique

Un fichier renseignant toutes les commandes rentrées dans le minishell est disponible sous `~/minishell_logs/command_history` à partir du moment où une commande est rentrée dans le terminal. La commande **history** a également été programmée, et permet la visualisation du fichier susmentionné dans le terminal.

2.4.5 Un mode de lancement "batch"

Un mode de lancement spécial "batch" a été réalisé, qui permet l'exécution de commandes par argument (qu'elles soient simples ou imbriquées avec des opérateurs).

Pour utiliser le mode batch, la syntaxe est la suivante :

- `./[path_to_minishell_executable] [OPTION] <command>`

Les différentes options possibles sont :

- `-c, --command <command>`: Execute the specified command and exit.
- `--help`: Display help message and exit.

2.4.6 La prise en charge d'alias temporaires

Une gestion des alias temporaires, donc disponibles durant une session du minishell, a été prévue (gestion et utilisation des alias dans les commandes lancées).

Les différentes actions possibles sur les alias sont les suivantes :

- La définition d'alias
 - alias [nom_alias]='[command]'
- L'affichage de la commande correspondante à un alias
 - alias [nom_alias]
- L'affichage de toutes les définitions d'alias
 - alias
- La suppression d'alias
 - unalias [nom_alias]
- La suppression de tous les alias
 - unalias -a

2.5 Page de manuel linux

Une page de manuel linux a été créée pour le minishell, et est disponible dans le dossier doc/ sous le nom minishell. Elle peut être consultée en utilisant la commande suivante dans un terminal :

```
man doc/minishell.1
```

Il est possible de l'ajouter au système de manuel linux en copiant le fichier minishell.1 dans le dossier /usr/share/man/man1/ (nécessite les droits administrateurs) :

```
sudo cp doc/minishell.1 /usr/share/man/man1/
```

Après cela, la page de manuel pourra être consultée avec la commande :

```
man minishell
```

Si vous ne souhaitez plus avoir accès à la page de manuel, il suffit de supprimer le fichier copié dans /usr/share/man/man1/ :

```
sudo rm /usr/share/man/man1/minishell.1
```


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Directory Hierarchy

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Data Structure Index

4.1 Data Structures

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File Index

5.1 File List

Here is a list of all files with brief descriptions:

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Chapter 6

Directory Documentation

6.1 include Directory Reference

Files

- file `aliases.h`
- file `batch.h`
- file `env.h`
- file `executor.h`
- file `history.h`
- file `internal_commands.h`
- file `parser.h`
- file `typedef.h`

6.2 src Directory Reference

Directory dependency graph for src:

Files

- file `aliases.c`
Implementation of alias handling for the minishell.
- file `batch.c`
Handles batch mode execution for the minishell.
- file `env.c`
Implementation of environment variable management for the minishell.
- file `executor.c`
Implementation of command execution for the minishell.
- file `history.c`
Implementation of command history handling for the minishell.
- file `internal_commands.c`
Implementation of internal commands for the minishell.
- file `main.c`
Main entry point for the minishell application.
- file `parser.c`
Implementation of the command line parser for the minishell.

Chapter 7

Data Structure Documentation

7.1 Alias Struct Reference

```
#include <typedef.h>
```

Data Fields

- char * [name](#)
- char * [command](#)

7.1.1 Detailed Description

Structure for alias management

7.1.2 Field Documentation

7.1.2.1 [command](#)

```
char* Alias::command
```

7.1.2.2 [name](#)

```
char* Alias::name
```

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

- [include/typedef.h](#)

7.2 BackgroundProcess Struct Reference

```
#include <typedef.h>
```

Collaboration diagram for BackgroundProcess:

Data Fields

- int `count`
- `Jobs processes [MAX_BG_PROCESSES]`

7.2.1 Detailed Description

Structure to manage background processes

7.2.2 Field Documentation

7.2.2.1 `count`

```
int BackgroundProcess::count
```

7.2.2.2 `processes`

```
Jobs BackgroundProcess::processes [MAX_BG_PROCESSES]
```

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

- include/typedef.h

7.3 Command Struct Reference

```
#include <typedef.h>
```

Data Fields

- char * `command`
- `size_t length`
- char ** `args`
- int `arg_count`
- char * `input_redirect`
- char * `output_redirect`
- char * `heredoc_delimiter`
- bool `append_output`

7.3.1 Detailed Description

Structure to hold a single command and its details

7.3.2 Field Documentation

7.3.2.1 append_output

```
bool Command::append_output
```

7.3.2.2 arg_count

```
int Command::arg_count
```

7.3.2.3 args

```
char** Command::args
```

7.3.2.4 command

```
char* Command::command
```

7.3.2.5 heredoc_delimiter

```
char* Command::heredoc_delimiter
```

7.3.2.6 input_redirect

```
char* Command::input_redirect
```

7.3.2.7 length

```
size_t Command::length
```

7.3.2.8 output_redirect

```
char* Command::output_redirect
```

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

- [include/typedef.h](#)

7.4 Commands Struct Reference

```
#include <typedef.h>
```

Collaboration diagram for Commands:

Data Fields

- Command `commands` [`MAX_COMMANDS`]
- `char *` `operators` [`MAX_COMMANDS`]
- `int` `command_count`

7.4.1 Detailed Description

Structure to hold multiple commands and their operators

7.4.2 Field Documentation

7.4.2.1 `command_count`

```
int Commands::command_count
```

7.4.2.2 `commands`

```
Command Commands::commands [MAX_COMMANDS]
```

7.4.2.3 `operators`

```
char* Commands::operators [MAX_COMMANDS]
```

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

- `include/typedef.h`

7.5 EnvVar Struct Reference

```
#include <typedef.h>
```

Collaboration diagram for EnvVar:

Data Fields

- `char *` `name`
- `char *` `value`
- struct `EnvVar *` `next`

7.5.1 Field Documentation

7.5.1.1 name

```
char* EnvVar::name
```

7.5.1.2 next

```
struct EnvVar* EnvVar::next
```

7.5.1.3 value

```
char* EnvVar::value
```

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

- [include/typedef.h](#)

7.6 Jobs Struct Reference

```
#include <typedef.h>
```

Data Fields

- pid_t [pid](#)
- char * [command](#)

7.6.1 Detailed Description

Structure to hold background job details

7.6.2 Field Documentation

7.6.2.1 command

```
char* Jobs::command
```

7.6.2.2 pid

```
pid_t Jobs::pid
```

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

- [include/typedef.h](#)

Chapter 8

File Documentation

8.1 include/aliases.h File Reference

```
#include "typedef.h"
#include <limits.h>
```

Include dependency graph for aliases.h: This graph shows which files directly or indirectly include this file:

Macros

- #define MAX_ALIASES 20

Functions

- void `handle_alias` (char **args)
Handles the alias command and its various functionalities.
- void `handle_unalias` (char **args)
Handles the unalias command and its various functionalities.
- void `add_alias` (Alias new_alias)
Adds a new alias to the alias list.
- void `remove_alias` (const char *name)
Removes an alias from the alias list from its name.
- int `is_alias` (const char *name)
Checks if a given name corresponds to an existing alias.
- void `list_aliases` ()
Lists all currently defined aliases. Used when the alias command is called without arguments.
- void `free_aliases` ()
Frees all allocated memory for aliases and resets the alias count.
- char * `get_alias_command` (const char *name)
Retrieves the command associated with a given alias name.

8.1.1 Macro Definition Documentation

8.1.1.1 MAX_ALIASES

```
#define MAX_ALIASES 20
```

8.1.2 Function Documentation

8.1.2.1 add_alias()

```
void add_alias (
    Alias new_alias)
```

Adds a new alias to the alias list.

Parameters

<i>new_alias</i>	The Alias struct containing the name and command of the new alias.
------------------	--

8.1.2.2 free_aliases()

```
void free_aliases ()
```

Frees all allocated memory for aliases and resets the alias count.

8.1.2.3 get_alias_command()

```
char * get_alias_command (
    const char * name)
```

Retrieves the command associated with a given alias name.

Parameters

<i>name</i>	The name of the alias.
-------------	------------------------

Returns

The command string if the alias exists, NULL otherwise.

8.1.2.4 handle_alias()

```
void handle_alias (
    char ** args)
```

Handles the alias command and its various functionalities.

Parameters

<i>args</i>	The different arguments passed to the alias command.
-------------	--

8.1.2.5 handle_unalias()

```
void handle_unalias (
    char ** args)
```

Handles the unalias command and its various functionalities.

Parameters

<i>args</i>	The different arguments passed to the unalias command (an alias name or -a).
-------------	--

8.1.2.6 is_alias()

```
int is_alias (
    const char * name)
```

Checks if a given name corresponds to an existing alias.

Parameters

<i>name</i>	The name to check.
-------------	--------------------

Returns

EXIT_SUCCESS if the name is an alias, EXIT_FAILURE otherwise.

8.1.2.7 list_aliases()

```
void list_aliases ()
```

Lists all currently defined aliases. Used when the alias command is called without arguments.

8.1.2.8 remove_alias()

```
void remove_alias (
    const char * name)
```

Removes an alias from the alias list from its name.

Parameters

<i>name</i>	The name of the alias to remove.
-------------	----------------------------------

8.2 aliases.h

[Go to the documentation of this file.](#)

```
00001 #ifndef ALIASES_H
00002 #define ALIASES_H
00003
00004 #include "typedef.h"
00005 #include <limits.h>
00006
00007 #define MAX_ALIASES 20
00008
00013 void handle_alias(char **args);
00014
00019 void handle_unalias(char **args);
00020
00025 void add_alias(Alias new_alias);
00026
00031 void remove_alias(const char *name);
00032
00038 int is_alias(const char *name);
00039
00044 void list_aliases();
00045
00049 void free_aliases();
00050
00056 char* get_alias_command(const char *name);
00057
00058 #endif // ALIASES_H
```

8.3 include/batch.h File Reference

```
#include "typedef.h"
#include "internal_commands.h"
#include "parser.h"
#include "executor.h"
```

Include dependency graph for batch.h: This graph shows which files directly or indirectly include this file:

Macros

- [#define MAX_ARGUMENTS 3](#)

Functions

- [int handle_arguments \(int argc, const char *argv\[\]\)](#)
Handles command-line arguments for batch mode. Possible options are:

8.3.1 Macro Definition Documentation

8.3.1.1 MAX_ARGUMENTS

```
#define MAX_ARGUMENTS 3
```

8.3.2 Function Documentation

8.3.2.1 handle_arguments()

```
int handle_arguments (
    int argc,
    const char * argv[ ])
```

Handles command-line arguments for batch mode. Possible options are:

- -c, --command <command>: Execute the specified command and exit.
- --help: Display help message and exit.

Parameters

<i>argc</i>	Argument count.
<i>argv</i>	Argument vector.

Returns

Returns EXIT_SUCCESS or EXIT_FAILURE.

8.4 batch.h

[Go to the documentation of this file.](#)

```
00001 #ifndef BATCH_H
00002 #define BATCH_H
00003
00004 #include "typedef.h"
00005 #include "internal_commands.h"
00006 #include "parser.h"
00007 #include "executor.h"
00008
00009 #define MAX_ARGUMENTS 3
00010
00020 int handle_arguments(int argc, const char *argv[]);
00021
00022 #endif // BATCH_H
```

8.5 include/env.h File Reference

#include "typedef.h"

Include dependency graph for env.h: This graph shows which files directly or indirectly include this file:

Functions

- void [set_env_var](#) (const char *name, const char *value)
- void [unset_env_var](#) (const char *name)
- char * [get_env_var](#) (const char *name)
- void [print_env_vars](#) ()

8.5.1 Function Documentation

8.5.1.1 `get_env_var()`

```
char * get_env_var (
    const char * name)
```

8.5.1.2 `print_env_vars()`

```
void print_env_vars ()
```

8.5.1.3 `set_env_var()`

```
void set_env_var (
    const char * name,
    const char * value)
```

8.5.1.4 `unset_env_var()`

```
void unset_env_var (
    const char * name)
```

8.6 env.h

[Go to the documentation of this file.](#)

```
00001 #ifndef ENV_H
00002 #define ENV_H
00003
00004 #include "typedef.h"
00005
00006 void set_env_var(const char* name, const char* value);
00007 void unset_env_var(const char* name);
00008
00009 char* get_env_var(const char* name);
00010 void print_env_vars();
00011
00012 #endif // ENV_H
```

8.7 include/executor.h File Reference

```
#include "typedef.h"
#include "internal_commands.h"
#include "aliases.h"
#include "history.h"
```

Include dependency graph for executor.h: This graph shows which files directly or indirectly include this file:

Functions

- int `execute_command (Command *command, bool is_background)`
Executes a single command, checking for internal commands first.
- void `execute_commands (Commands *commands, BackgroundProcess *bg_processes)`
Executes a series of commands with their associated operators.
- int `create_child_process (Command *command, bool is_background)`
Creates a child process to execute a command.
- void `check_bg_processes (BackgroundProcess *bg_processes)`
Checks the status of background processes and cleans up finished ones.
- int `execute_pipes (Commands *commands, int start_index, int end_index)`
Executes a series of piped commands.
- int `setup_redirections (Command *command)`
Sets up input and output redirections for a command.
- int `handle_heredoc (Command *command)`
Handles here-document (heredoc) input for a command.

8.7.1 Function Documentation

8.7.1.1 `check_bg_processes()`

```
void check_bg_processes (
    BackgroundProcess * bg_processes)
```

Checks the status of background processes and cleans up finished ones.

Parameters

<code>bg_processes</code>	Pointer to the <code>BackgroundProcess</code> struct managing background jobs.
---------------------------	--

8.7.1.2 `create_child_process()`

```
int create_child_process (
    Command * command,
    bool is_background)
```

Creates a child process to execute a command.

Parameters

<code>command</code>	Pointer to the <code>Command</code> struct to execute.
<code>is_background</code>	Boolean indicating if the command should run in the background.

Returns

Exit status of the command execution.

8.7.1.3 execute_command()

```
int execute_command (
    Command * command,
    bool is_background)
```

Executes a single command, checking for internal commands first.

Parameters

<i>command</i>	Pointer to the Command struct to execute.
<i>is_background</i>	Boolean indicating if the command should run in the background.

Returns

Exit status of the command execution.

8.7.1.4 execute_commands()

```
void execute_commands (
    Commands * commands,
    BackgroundProcess * bg_processes)
```

Executes a series of commands with their associated operators.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
-----------------	---

8.7.1.5 execute_pipes()

```
int execute_pipes (
    Commands * commands,
    int start_index,
    int end_index)
```

Executes a series of piped commands.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
<i>start_index</i>	Index of the first command in the pipe sequence.
<i>end_index</i>	Index of the last command in the pipe sequence.

Returns

Exit status of the last command in the pipe sequence.

8.7.1.6 handle_heredoc()

```
int handle_heredoc (
    Command * command)
```

Handles here-document (heredoc) input for a command.

Parameters

<i>command</i>	Pointer to the Command struct containing the heredoc delimiter.
----------------	---

Returns

0 on success, -1 on failure.

8.7.1.7 setup_redirections()

```
int setup_redirections (
    Command * command)
```

Sets up input and output redirections for a command.

Parameters

<i>command</i>	Pointer to the Command struct to set up redirections for.
----------------	---

Returns

0 on success, -1 on failure.

8.8 executor.h

[Go to the documentation of this file.](#)

```
00001 #ifndef EXECUTOR_H
00002 #define EXECUTOR_H
00003
00004 #include "typedef.h"
00005 #include "internal_commands.h"
00006 #include "aliases.h"
00007 #include "history.h"
00008
00015 int execute_command(Command* command, bool is_background);
00016
00021 void execute_commands(Commands* commands, BackgroundProcess* bg_processes);
00022
00029 int create_child_process(Command* command, bool is_background);
00030
00035 void check_bg_processes(BackgroundProcess* bg_processes);
00036
00044 int execute_pipes(Commands* commands, int start_index, int end_index);
00045
00051 int setup_redirections(Command* command);
00052
00058 int handle_heredoc(Command* command);
00059
00060 #endif // EXECUTOR_H
```

8.9 include/history.h File Reference

```
#include "typedef.h"
```

Include dependency graph for history.h: This graph shows which files directly or indirectly include this file:

Functions

- void [handle_history](#) (char **args)
Built-in history command handler. Handles displaying the command history to the user.
- void [add_to_history](#) (char *command_line)
Handles writing inputted commands in history file (~minishell_logs/command_history).

8.9.1 Function Documentation

8.9.1.1 add_to_history()

```
void add_to_history (
    char * command_line)
```

Handles writing inputted commands in history file (~minishell_logs/command_history).

Parameters

<i>command_line</i>	The entire command line that needs to be added in the history file.
---------------------	---

8.9.1.2 handle_history()

```
void handle_history (
    char ** args)
```

Built-in history command handler. Handles displaying the command history to the user.

Parameters

<i>args</i>	voided
-------------	--------

8.10 history.h

[Go to the documentation of this file.](#)

```
00001 #ifndef HISTORY_H
00002 #define HISTORY_H
00003
00004 #include "typedef.h"
00005
00011 void handle_history(char** args);
00012
00017 void add_to_history(char* command_line);
00018
00019 #endif // HISTORY_H
```

8.11 include/internal_commands.h File Reference

```
#include "typedef.h"
#include "aliases.h"
```

Include dependency graph for internal_commands.h: This graph shows which files directly or indirectly include this file:

Functions

- void [handle_cd](#) (char **args)
Built-in cd command handler.
- void [handle_pwd](#) (char **args)
Built-in pwd command handler.
- void [handle_echo](#) (char **args)
Built-in echo command handler.
- void [handle_exit](#) ([Commands](#) *commands)
Built-in exit command handler. Exits the shell after freeing necessary resources.
- void [free_if_needed](#) (void *to_free)
Frees memory if the pointer is not NULL.
- void [free_commands](#) ([Commands](#) *commands)
Frees all allocated memory in the [Commands](#) struct.

Variables

- char * [work_dir](#)

8.11.1 Function Documentation

8.11.1.1 [free_commands\(\)](#)

```
void free_commands (
    Commands * commands)
```

Frees all allocated memory in the [Commands](#) struct.

Parameters

<i>commands</i>	Pointer to the Commands struct to free.
-----------------	---

8.11.1.2 free_if_needed()

```
void free_if_needed (
    void * to_free)
```

Frees memory if the pointer is not NULL.

Parameters

<i>to_free</i>	Pointer to the memory to free.
----------------	--------------------------------

8.11.1.3 handle_cd()

```
void handle_cd (
    char ** args)
```

Built-in cd command handler.

Parameters

<i>args</i>	Command arguments, handles correctly changing directories, and specific cases like "cd ~".
-------------	--

8.11.1.4 handle_echo()

```
void handle_echo (
    char ** args)
```

Built-in echo command handler.

Parameters

<i>args</i>	Command arguments to echo back to the user.
-------------	---

8.11.1.5 handle_exit()

```
void handle_exit (
    Commands * commands)
```

Built-in exit command handler. Exits the shell after freeing necessary resources.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
-----------------	---

8.11.1.6 handle_pwd()

```
void handle_pwd (
    char ** args)
```

Built-in pwd command handler.

Parameters

<i>args</i>	voided
-------------	--------

8.11.2 Variable Documentation

8.11.2.1 work_dir

```
char* work_dir [extern]
```

The path to the current workdir

8.12 internal_commands.h

[Go to the documentation of this file.](#)

```
00001 #ifndef INTERNAL_COMMANDS_H
00002 #define INTERNAL_COMMANDS_H
00003
00004 #include "typedef.h"
00005 #include "aliases.h"
00006
00007 extern char *work_dir;
00008
00013 void handle_cd(char** args);
00014
00019 void handle_pwd(char** args);
00020
00025 void handle_echo(char** args);
00026
00032 void handle_exit(Commands* commands);
00033
00038 void free_if_needed(void* to_free);
00039
00044 void free_commands(Commands* commands);
00045
00046 #endif // INTERNAL_COMMANDS_H
```

8.13 include/parser.h File Reference

```
#include "typedef.h"
#include "internal_commands.h"
```

Include dependency graph for parser.h: This graph shows which files directly or indirectly include this file:

Functions

- int `detect_operator` (const char **p*, const char ***op_found*)
Detects if the current position in the input line matches any known operator.
- char * `trim_whitespace` (const char **line*)
Trims leading and trailing whitespace from a given line.
- void `split_line` (const char **line*, `Commands` **commands*)
Splits the input line into commands and operators, populating the `Commands` struct.
- void `parse_command` (`Command` **command*)
Parses a command string into its arguments and populates the `Command` struct.

8.13.1 Function Documentation

8.13.1.1 `detect_operator()`

```
int detect_operator (
    const char * p,
    const char ** op_found)
```

Detects if the current position in the input line matches any known operator.

Parameters

<i>p</i>	Pointer to the current position in the input line.
<i>op_found</i>	Pointer to store the found operator string.

Returns

Length of the detected operator, or 0 if none found.

8.13.1.2 `parse_command()`

```
void parse_command (
    Command * command)
```

Parses a command string into its arguments and populates the `Command` struct.

Parameters

<i>command</i>	Pointer to the <code>Command</code> struct to populate.
----------------	---

8.13.1.3 split_line()

```
void split_line (
    const char * line,
    Commands * commands)
```

Splits the input line into commands and operators, populating the [Commands](#) struct.

Parameters

<i>line</i>	Pointer to the input line.
<i>commands</i>	Pointer to the Commands struct to populate.

8.13.1.4 trim_whitespace()

```
char * trim_whitespace (
    const char * line)
```

Trims leading and trailing whitespace from a given line.

Parameters

<i>line</i>	Pointer to the input line.
-------------	----------------------------

Returns

Newly allocated string with trimmed whitespace.

8.14 parser.h

[Go to the documentation of this file.](#)

```
00001 #ifndef PARSER_H
00002 #define PARSER_H
00003
00004 #include "typedef.h"
00005 #include "internal_commands.h"
00006
00013 int detect_operator(const char* p, const char** op_found);
00014
00020 char* trim_whitespace(const char* line);
00021
00027 void split_line(const char* line, Commands *commands);
00028
00033 void parse_command(Command* command);
00034
00035 #endif // PARSER_H
```

8.15 include/typedef.h File Reference

```
#include <string.h>
#include <stdbool.h>
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
#include <sys/wait.h>
#include <fcntl.h>
#include <errno.h>
#include <sys/stat.h>
#include <sys/types.h>
```

Include dependency graph for typedef.h: This graph shows which files directly or indirectly include this file:

Data Structures

- struct [Command](#)
- struct [Commands](#)
- struct [Jobs](#)
- struct [BackgroundProcess](#)
- struct [Alias](#)
- struct [EnvVar](#)

Macros

- #define [MAX_COMMANDS](#) 3
- #define [MAX_BG_PROCESSES](#) 10
- #define [GREEN](#) "\033[1;32m"
- #define [BLUE](#) "\033[1;34m"
- #define [COLOR_RESET](#) "\033[0m"

Typedefs

- typedef struct Command [Command](#)
- typedef struct Commands [Commands](#)
- typedef struct Jobs [Jobs](#)
- typedef struct BackgroundProcess [BackgroundProcess](#)
- typedef struct Alias [Alias](#)
- typedef struct EnvVar [EnvVar](#)

8.15.1 Macro Definition Documentation

8.15.1.1 BLUE

```
#define BLUE "\033[1;34m"
```

8.15.1.2 COLOR_RESET

```
#define COLOR_RESET "\033[0m"
```

8.15.1.3 GREEN

```
#define GREEN "\033[1;32m"
```

8.15.1.4 MAX_BG_PROCESSES

```
#define MAX_BG_PROCESSES 10
```

8.15.1.5 MAX_COMMANDS

```
#define MAX_COMMANDS 3
```

8.15.2 Typedef Documentation

8.15.2.1 Alias

```
typedef struct Alias Alias
```

Structure for alias management

8.15.2.2 BackgroundProcess

```
typedef struct BackgroundProcess BackgroundProcess
```

Structure to manage background processes

8.15.2.3 Command

```
typedef struct Command Command
```

Structure to hold a single command and its details

8.15.2.4 Commands

```
typedef struct Commands Commands
```

Structure to hold multiple commands and their operators

8.15.2.5 EnvVar

```
typedef struct EnvVar EnvVar
```

8.15.2.6 Jobs

```
typedef struct Jobs Jobs
```

Structure to hold background job details

8.16 typedef.h

[Go to the documentation of this file.](#)

```
00001 #ifndef TYPEDEF_H
00002 #define TYPEDEF_H
00003
00020
00021 #include <string.h>
00022 #include <stdbool.h>
00023 #include <unistd.h>
00024 #include <stdio.h>
00025 #include <stdlib.h>
00026 #include <sys/wait.h>
00027 #include <fcntl.h>
00028 #include <errno.h>
00029 #include <sys/stat.h>
00030 #include <sys/types.h>
00031
00032 #define MAX_COMMANDS      3
00033 #define MAX_BG_PROCESSES  10
00034
00035 #define GREEN           "\033[1;32m"
00036 #define BLUE            "\033[1;34m"
00037 #define COLOR_RESET     "\033[0m"
00038
00040 typedef struct Command {
00041     char*   command;          // Original command string
00042     size_t   length;          // Length of the command string
00043     char**  args;             // Argument list
00044     int     arg_count;        // Number of arguments related to the command
00045     char*   input_redirect;   // file for <
00046     char*   output_redirect; // file for > or »
00047     char*   heredoc_delimiter; // delimiter for «
00048     bool    append_output;    // true for », false for >
00049 } Command;
00050
00052 typedef struct Commands {
00053     Command commands[MAX_COMMANDS]; // Array of parsed commands
00054     char*   operators[MAX_COMMANDS]; // Operators between commands
00055     int     command_count;         // Number of commands parsed
00056 } Commands;
00057
00059 typedef struct Jobs {
00060     pid_t   pid;              // Process ID
00061     char*   command;          // Command string
00062 } Jobs;
00063
00065 typedef struct BackgroundProcess {
00066     int     count;             // Number of background processes
00067     Jobs   processes[MAX_BG_PROCESSES]; // Array of background processes
00068 } BackgroundProcess;
00069
00071 typedef struct Alias {
00072     char*   name;              // Alias name
00073     char*   command;          // Command string
00074 } Alias;
00075
00076 typedef struct EnvVar {
00077     char*   name;              // Environment variable name
00078     char*   value;             // Environment variable value
00079     struct EnvVar* next;      // Pointer to the next variable in the list
00080 } EnvVar;
00081
00082 #endif // TYPEDEF_H
```

8.17 README.md File Reference

8.18 src/aliases.c File Reference

Implementation of alias handling for the minishell.

```
#include "../include/aliases.h"
Include dependency graph for aliases.c:
```

8.19 src/batch.c File Reference

Handles batch mode execution for the minishell.

```
#include "../include/batch.h"
Include dependency graph for batch.c:
```

Functions

- int [handle_arguments](#) (int argc, const char *argv[])

Handles command-line arguments for batch mode. Possible options are:

Variables

- const char * [minishell_options](#) [] = {"-c", "--command", "--help", NULL}
- [Commands batch_command](#)
- [BackgroundProcess bg_processes](#)

8.19.1 Detailed Description

Handles batch mode execution for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.19.2 Function Documentation

8.19.2.1 handle_arguments()

```
int handle_arguments (
    int argc,
    const char * argv[ ]) 
```

Handles command-line arguments for batch mode. Possible options are:

- -c, --command <command>: Execute the specified command and exit.
- --help: Display help message and exit.

Parameters

<i>argc</i>	Argument count.
<i>argv</i>	Argument vector.

Returns

Returns EXIT_SUCCESS or EXIT_FAILURE.

8.19.3 Variable Documentation

8.19.3.1 batch_command

[Commands](#) batch_command

The command to be run

8.19.3.2 bg_processes

[BackgroundProcess](#) bg_processes [extern]

8.19.3.3 minishell_options

```
const char* minishell_options[ ] = { "-c", "--command", "--help", NULL} 
```

List of possible options to use for batch mode

8.20 src/env.c File Reference

Implementation of environment variable management for the minishell.

```
#include "../include/env.h"
```

Include dependency graph for env.c:

Functions

- void `set_env_var` (const char *name, const char *value)
- void `unset_env_var` (const char *name)
- char * `get_env_var` (const char *name)
- void `print_env_vars` ()

Variables

- `EnvVar * env_vars_head` = NULL
- `EnvVar * env_vars_tail` = NULL

8.20.1 Detailed Description

Implementation of environment variable management for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.20.2 Function Documentation

8.20.2.1 `get_env_var()`

```
char * get_env_var (
    const char * name)
```

8.20.2.2 `print_env_vars()`

```
void print_env_vars ()
```

8.20.2.3 `set_env_var()`

```
void set_env_var (
    const char * name,
    const char * value)
```

8.20.2.4 `unset_env_var()`

```
void unset_env_var (
    const char * name)
```

8.20.3 Variable Documentation

8.20.3.1 env_vars_head

```
EnvVar* env_vars_head = NULL
```

8.20.3.2 env_vars_tail

```
EnvVar* env_vars_tail = NULL
```

8.21 src/executor.c File Reference

Implementation of command execution for the minishell.

```
#include "../include/executor.h"
```

Include dependency graph for executor.c:

Functions

- int `create_child_process` (`Command` *command, bool is_background)
Creates a child process to execute a command.
- void `execute_commands` (`Commands` *commands, `BackgroundProcess` *bg_processes)
Executes a series of commands with their associated operators.
- int `execute_command` (`Command` *command, bool is_background)
Executes a single command, checking for internal commands first.
- void `check_bg_processes` (`BackgroundProcess` *bg_processes)
Checks the status of background processes and cleans up finished ones.
- int `execute_pipes` (`Commands` *commands, int start_index, int end_index)
Executes a series of piped commands.
- int `setup_redirections` (`Command` *command)
Sets up input and output redirections for a command.
- int `handle_heredoc` (`Command` *command)
Handles here-document (heredoc) input for a command.

Variables

- const char * `internal_cmds_list` [] = {"cd", "pwd", "echo", "history", "alias", "unalias", NULL}
- void(* `internal_cmds` [])(char **) = {&handle_cd, &handle_pwd, &handle_echo, &handle_history, &handle_alias, &handle_unalias, NULL}

8.21.1 Detailed Description

Implementation of command execution for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.21.2 Function Documentation

8.21.2.1 check_bg_processes()

```
void check_bg_processes (
    BackgroundProcess * bg_processes)
```

Checks the status of background processes and cleans up finished ones.

Parameters

<i>bg_processes</i>	Pointer to the BackgroundProcess struct managing background jobs.
---------------------	---

8.21.2.2 create_child_process()

```
int create_child_process (
    Command * command,
    bool is_background)
```

Creates a child process to execute a command.

Parameters

<i>command</i>	Pointer to the Command struct to execute.
<i>is_background</i>	Boolean indicating if the command should run in the background.

Returns

Exit status of the command execution.

8.21.2.3 execute_command()

```
int execute_command (
    Command * command,
    bool is_background)
```

Executes a single command, checking for internal commands first.

Parameters

<i>command</i>	Pointer to the Command struct to execute.
<i>is_background</i>	Boolean indicating if the command should run in the background.

Returns

Exit status of the command execution.

8.21.2.4 execute_commands()

```
void execute_commands (
    Commands * commands,
    BackgroundProcess * bg_processes)
```

Executes a series of commands with their associated operators.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
-----------------	---

8.21.2.5 execute_pipes()

```
int execute_pipes (
    Commands * commands,
    int start_index,
    int end_index)
```

Executes a series of piped commands.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
<i>start_index</i>	Index of the first command in the pipe sequence.
<i>end_index</i>	Index of the last command in the pipe sequence.

Returns

Exit status of the last command in the pipe sequence.

8.21.2.6 handle_heredoc()

```
int handle_heredoc (
    Command * command)
```

Handles here-document (heredoc) input for a command.

Parameters

<i>command</i>	Pointer to the Command struct containing the heredoc delimiter.
----------------	---

Returns

0 on success, -1 on failure.

8.21.2.7 setup_redirections()

```
int setup_redirections (
    Command * command)
```

Sets up input and output redirections for a command.

Parameters

<i>command</i>	Pointer to the Command struct to set up redirections for.
----------------	---

Returns

0 on success, -1 on failure.

8.21.3 Variable Documentation

8.21.3.1 internal_cmds

```
void(* internal_cmds[ ]) (char **) (
    char ** ) = {&handle_cd, &handle_pwd, &handle_echo, &handle_history, &handle_alias,
&handle_unalias, NULL}
```

List of pointers to internal command functions

8.21.3.2 internal_cmds_list

```
const char* internal_cmds_list[] = {"cd", "pwd", "echo", "history", "alias", "unalias", NULL}
```

List of internal commands

8.22 src/history.c File Reference

Implementation of command history handling for the minishell.

```
#include "../include/history.h"
```

Include dependency graph for history.c:

Functions

- void [handle_history](#) (char **args)

Built-in history command handler. Handles displaying the command history to the user.
- void [add_to_history](#) (char *command_line)

Handles writing inputted commands in history file (~/.minishell_logs/command_history).

8.22.1 Detailed Description

Implementation of command history handling for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.22.2 Function Documentation

8.22.2.1 add_to_history()

```
void add_to_history (
    char * command_line)
```

Handles writing inputted commands in history file (~minishell_logs/command_history).

Parameters

<i>command_line</i>	The entire command line that needs to be added in the history file.
---------------------	---

8.22.2.2 handle_history()

```
void handle_history (
    char ** args)
```

Built-in history command handler. Handles displaying the command history to the user.

Parameters

<i>args</i>	voided
-------------	--------

8.23 src/internal_commands.c File Reference

Implementation of internal commands for the minishell.

```
#include "../include/internal_commands.h"
Include dependency graph for internal_commands.c:
```

Functions

- void `handle_exit (Commands *commands)`
Built-in exit command handler. Exits the shell after freeing necessary resources.
- void `handle_pwd (char **args)`
Built-in pwd command handler.
- void `handle_cd (char **args)`
Built-in cd command handler.
- void `handle_echo (char **args)`
Built-in echo command handler.
- void `free_if_needed (void *to_free)`
Frees memory if the pointer is not NULL.
- void `free_commands (Commands *commands)`
Frees all allocated memory in the `Commands` struct.

Variables

- char * `work_dir`

8.23.1 Detailed Description

Implementation of internal commands for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.23.2 Function Documentation

8.23.2.1 free_commands()

```
void free_commands (
    Commands * commands)
```

Frees all allocated memory in the `Commands` struct.

Parameters

<code>commands</code>	Pointer to the <code>Commands</code> struct to free.
-----------------------	--

8.23.2.2 free_if_needed()

```
void free_if_needed (
    void * to_free)
```

Frees memory if the pointer is not NULL.

Parameters

<i>to_free</i>	Pointer to the memory to free.
----------------	--------------------------------

8.23.2.3 handle_cd()

```
void handle_cd (
    char ** args)
```

Built-in cd command handler.

Parameters

<i>args</i>	Command arguments, handles correctly changing directories, and specific cases like "cd ~".
-------------	--

8.23.2.4 handle_echo()

```
void handle_echo (
    char ** args)
```

Built-in echo command handler.

Parameters

<i>args</i>	Command arguments to echo back to the user.
-------------	---

8.23.2.5 handle_exit()

```
void handle_exit (
    Commands * commands)
```

Built-in exit command handler. Exits the shell after freeing necessary resources.

Parameters

<i>commands</i>	Pointer to the Commands struct containing commands and operators.
-----------------	---

8.23.2.6 handle_pwd()

```
void handle_pwd (
    char ** args)
```

Built-in pwd command handler.

Parameters

<i>args</i>	voided
-------------	--------

8.23.3 Variable Documentation

8.23.3.1 work_dir

```
char* work_dir
```

The path to the current workdir

8.24 src/main.c File Reference

Main entry point for the minishell application.

```
#include "../include/typedef.h"
#include "../include/parser.h"
#include "../include/internal_commands.h"
#include "../include/executor.h"
#include "../include/batch.h"
Include dependency graph for main.c:
```

Functions

- void [write_prompt](#) (bool is_compact)
- int [main](#) (int argc, const char *argv[])

Variables

- [Commands parsed_commands](#)
- [BackgroundProcess bg_processes](#) = {.count = 0}

8.24.1 Detailed Description

Main entry point for the minishell application.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.24.2 Function Documentation

8.24.2.1 main()

```
int main (
    int argc,
    const char * argv[ ])
```

8.24.2.2 write_prompt()

```
void write_prompt (
    bool is_compact)
```

8.24.3 Variable Documentation

8.24.3.1 bg_processes

```
BackgroundProcess bg_processes = { .count = 0 }
```

8.24.3.2 parsed_commands

```
Commands parsed_commands
```

8.25 src/parser.c File Reference

Implementation of the command line parser for the minishell.

```
#include "../include/parser.h"
```

Include dependency graph for parser.c:

Functions

- int **detect_operator** (const char *p, const char **op_found)

Detects if the current position in the input line matches any known operator.
- char * **trim_whitespace** (const char *line)

Trims leading and trailing whitespace from a given line.
- void **split_line** (const char *line, **Commands** *commands)

*Splits the input line into commands and operators, populating the **Commands** struct.*
- void **parse_command** (**Command** *command)

*Parses a command string into its arguments and populates the **Command** struct.*

Variables

- const char * **OPERATORS** [] = {"&&", "||", "&", "|", ";", NULL}
- const char * **REDIRECTORS** [] = {"<<", ">>", "<", ">", NULL}

8.25.1 Detailed Description

Implementation of the command line parser for the minishell.

Author

BRENNER Quentin, NEAGELY Jeannot

Date

2025-2026

8.25.2 Function Documentation

8.25.2.1 detect_operator()

```
int detect_operator (
    const char * p,
    const char ** op_found)
```

Detects if the current position in the input line matches any known operator.

Parameters

<i>p</i>	Pointer to the current position in the input line.
<i>op_found</i>	Pointer to store the found operator string.

Returns

Length of the detected operator, or 0 if none found.

8.25.2.2 parse_command()

```
void parse_command (
    Command * command)
```

Parses a command string into its arguments and populates the [Command](#) struct.

Parameters

<i>command</i>	Pointer to the Command struct to populate.
----------------	--

8.25.2.3 split_line()

```
void split_line (
    const char * line,
    Commands * commands)
```

Splits the input line into commands and operators, populating the [Commands](#) struct.

Parameters

<i>line</i>	Pointer to the input line.
<i>commands</i>	Pointer to the Commands struct to populate.

8.25.2.4 trim_whitespace()

```
char * trim_whitespace (
    const char * line)
```

Trims leading and trailing whitespace from a given line.

Parameters

<i>line</i>	Pointer to the input line.
-------------	----------------------------

Returns

Newly allocated string with trimmed whitespace.

8.25.3 Variable Documentation

8.25.3.1 OPERATORS

```
const char* OPERATORS[ ] = {"&&", "||", "&", "|", ";", NULL}
```

8.25.3.2 REDIRECTORS

```
const char* REDIRECTORS[ ] = {"<<", ">>", "<", ">", NULL}
```

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