

We create a custom application called C Shell and manage its build and execution using a Makefile

Code: date.c

Description:

It could even run without giving options it would run same as it would have run with option d
Also this code can give errors whenever wrong command is given to it. It employs system calls, loops, and the exec family of functions to perform these operations

Usage: date [options] [file_path] (we don't need ./ to run its similar to creating new shell that works according to the way we want command like cd ls touch won't work here)

Options:

- R : Display RFC 5322 formatted date and time for file creation
- d : Display creation date and time.

Code: dir.c

Description:

The dir program allows users to create or remove directories. It employs system calls, loops, and the exec family of functions to perform these operations. The program supports verbose mode for displaying messages related to directory operations and offers the option to remove directories. Also this code can give errors whenever wrong command is given to it. It could even run without giving options it would run same as it would have run with option d

Assumption: While Changing Directory we change it to ".../my/newly_made_directory" but and save till everything in a variable .../my by getcwd() whenever another directory is made we first go to .../my by variable and then change to .../my/another_newly_made_directory. option = -r , without option , option = -v all change path in same fashion

Usage: dir [options] [directory_name]

Options:

- v : Verbose mode, displays messages about directory operations.
- r : Remove the specified directory.

Code: word.c

Description:

The word programs demonstrates the usage of system calls, loops, and the exec family of functions to achieve specific functionalities while adhering to error handling and command-line parsing requirements. Also this code can give errors whenever a wrong command is given to it. Word command always count word ignoring newlines pre assumed as it was not specified in question

Usage: word [options] [file_name]

Options:

- n : Count words ignoring newlines.
- d : Calculate the difference in word count between two files.

I would be attaching screenshot of each program working its not a part of 1 page documentation

```
[aryan@ARYANs-MacBook-Air-5 Os_Assignment_Q2 % make
gcc -c date.c -o date.o
gcc -c dir.c -o dir.o
gcc -c word.c -o word.o
gcc main.c date.o dir.o word.o -o shell
./shell
-----
-----CSHELL-----
-----
/Users/aryan/Desktop/Os_Assignment_Q2date -R file.txt
RFC 5322 formatted date and time: Mon, 28 Aug 2023 18:31:02
/Users/aryan/Desktop/Os_Assignment_Q2date file.txt
Creation date and time: Mon, 28 Aug 2023 18:31:02
/Users/aryan/Desktop/Os_Assignment_Q2date -d file.txt
Creation time 18:31:02
/Users/aryan/Desktop/Os_Assignment_Q2date -n file.txt
Please give the command in correct format
/Users/aryan/Desktop/Os_Assignment_Q2date apple.txt
Creation date and time: Mon, 28 Aug 2023 18:31:02
/Users/aryan/Desktop/Os_Assignment_Q2dir abc
Understanding and executing message
Creating directory
Changing directory to abc
/Users/aryan/Desktop/Os_Assignment_Q2/abkdir -v abc
Understanding and executing message
Directory already exists
/Users/aryan/Desktop/Os_Assignment_Q2/abkdir -r abc
/Users/aryan/Desktop/Os_Assignment_Q2dir basics
Understanding and executing message
Directory already exists
/Users/aryan/Desktop/Os_Assignment_Q2dir -v basics
Understanding and executing message
Directory already exists
/Users/aryan/Desktop/Os_Assignment_Q2/basickdir -r basics
```

Working of dir and date command with proper exception handling

```
/Users/aryan/Desktop/0s_Assignment_Q2word -n file.txt
Word count ignoring newlines: 18
/Users/aryan/Desktop/0s_Assignment_Q2word file.txt
Word count ignoring newlines: 18
/Users/aryan/Desktop/0s_Assignment_Q2word apple.txt
Error opening file
/Users/aryan/Desktop/0s_Assignment_Q2word -d file.txt file2.txt
Word count: 18
Word count : 7
Difference in word size between files: -11
/Users/aryan/Desktop/0s_Assignment_Q2
```

Working of word command

```
/Users/aryan/Desktop/0s_Assignment_Q2dir -r abcd
/Users/aryan/Desktop/0s_Assignment_Q2/abcd
```

dir -r also change directory