Jami Tanskanen 612705

Documentation (Project 2: Unix Utilities):

My-cat.c:

In my-cat.c, I wrote a C program to replicate the basic functionality of the Unix cat command. The program starts by checking if any file arguments are provided. If not, it exits. For each provided file name, it attempts to open and read the file. If the file can't be opened, an error message is displayed. The content of each file is read line by line into a buffer, which is then printed to the standard output. After displaying the content, the program closes the file before moving on to the next.

My-grep.c:

In my-grep.c, I developed a C program to mimic the basic features of the Unix grep command. At the beginning, the program checks if a search term is provided, and if not, it shows the correct usage and exits. If no files are specified, the program reads input from the standard input. For each file provided, the program attempts to open and read through it. If a file can't be opened, an error message is shown. Each line in a file (or from the standard input) is checked to see if it contains the specified search term. If a match is found, the line is printed. After searching through each file, the program closes it and moves on to the next. The program also manages memory by freeing any allocated memory for line buffers.

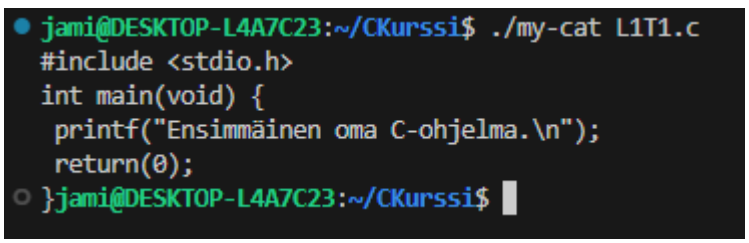
My-zip.c:

In my-zip.c, I developed a program to perform basic run-length encoding compression on one or more files. Initially, the program checks if at least one file is provided as input. If not, it outputs the correct usage and exits. For each specified file, the program tries to open it. If unsuccessful, it reports an error message. Once opened, the file's contents are read character by character. If consecutive characters are the same, a counter increase. When a different character is encountered or the end of the file is reached, the program writes the accumulated count as an integer followed by the character itself to the standard output. This compression method continues for the entirety of the file. Once a file is fully processed, it's closed, and the program moves to the next file if any remain.

My-unzip.c:

In my-unzip.c, I devised a program that decodes and expands files previously compressed using run-length encoding. To start, the program checks if a file has been provided as input. If omitted, it informs the user of the correct usage and then terminates. For every specified file, the program attempts to open it, and in case of a failure, it dispatches an error message. For a successfully opened file, the program reads blocks of data, beginning with an integer indicating the count, followed by the character itself. It then writes this character to the standard output as many times as the count specifies. This decompression technique is applied throughout the file. Upon completing the decoding for one file, the program closes it and proceeds to the next one, if available.

Screenshots:



```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-cat non_existent_file.txt
my-cat: cannot open file
jami@DESKTOP-L4A7C23:~/CKurssi$
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-grep adult sanat.txt
adult;1;1;18-05-2022 11:56:16
adult;3;2;29-07-2022 16:37:23
jami@DESKTOP-L4A7C23:~/CKurssi$
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-grep Adult sanat.txt
jami@DESKTOP-L4A7C23:~/CKurssi$
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-grep
my-grep: searchterm [file ...]
jami@DESKTOP-L4A7C23:~/CKurssi$
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-grep testi
tämä on testi
tämä on testi
kana
kävelee
testi
testi
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-grep testi non_existent_file.txt
my-grep: cannot open file
jami@DESKTOP-L4A7C23:~/CKurssi$
```

zip-test.txt

```
1    aaaaaaaaaabbbb
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-zip
my-zip: file1 [file2 ...]
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-zip non_existent_file.txt
my-zip: cannot open file
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-zip zip-test.txt > zip-test.z
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-unzip zip-test.z
aaaaaaaaaabbbbjami@DESKTOP-L4A7C23:~/CKurssi$
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-unzip
my-unzip: file1 [file2 ...]
```

```
jami@DESKTOP-L4A7C23:~/CKurssi$ ./my-unzip non_existent_file.zp
my-unzip: cannot open file
```