

## Unix utilities

### My-cat

My-cat is a simple program that simply prints out the contents of a file. It is given one or more filenames as parameters. My-cat will print out the contents of each file, with nothing separating the files in the output. Redirecting the output to a file using the '>' character works as well, for example `"/my-cat file1 file2>output"`.

### My-grep

My-grep is given a search term and zero or more files as arguments. My-grep will then search for the term in the contents of the files, and print out all matching lines. If multiple matches are found on the same line, the line gets printed out for each match. If no files are given, stdin will be searched instead. The output can be redirected with the '>' character. Example use: `"/my-grep text file1 file2>output"`.

One change I made from Linux's grep was that I printed every match to a separate line, while standard grep recolors all matches in a given line. Standard grep seems to continue looking for new matches after the matched pattern, but if a new match begins within the matched pattern, grep misses it. For example, if you search for "text" in the repeating pattern "texttext" grep will match "texttext", but my-grep will match "texttext" "texttext" and "texttext". I'm sure grep has some parameters that can make it behave this way, but this difference between my implementation and standard grep is good to know.

### My-zip and my-unzip

My-zip uses run-length-encoding to try and compress the information of the given files. My-zip is given one or more file names, which will be compressed into a binary file consisting of a 4-byte integer followed by a 1-byte character. When compressing multiple files, the files will be compressed together, with no way to separate the files again after compression. My-unzip will by default write its' output to stdout, so it's recommended to redirect the output to a file using the '>' character, for example: `"/my-zip file1 file2>zipped"`.

My-unzip uncompresses a file that was previously compressed by my-zip. My-unzip takes one parameter, the filename of the compressed file. By default, my-unzip prints the uncompressed output to stdout, but you can use the redirection to write the output to a file using for example `"/my-unzip zipped>unzipped"`.

Run-length encoding can in fact increase the file size, if there are not enough of the same character consecutively, since an integer is added before each character.

Source code available here: <https://github.com/Ketsuppimakkara/Systeemiohjelmointi-Project-2>

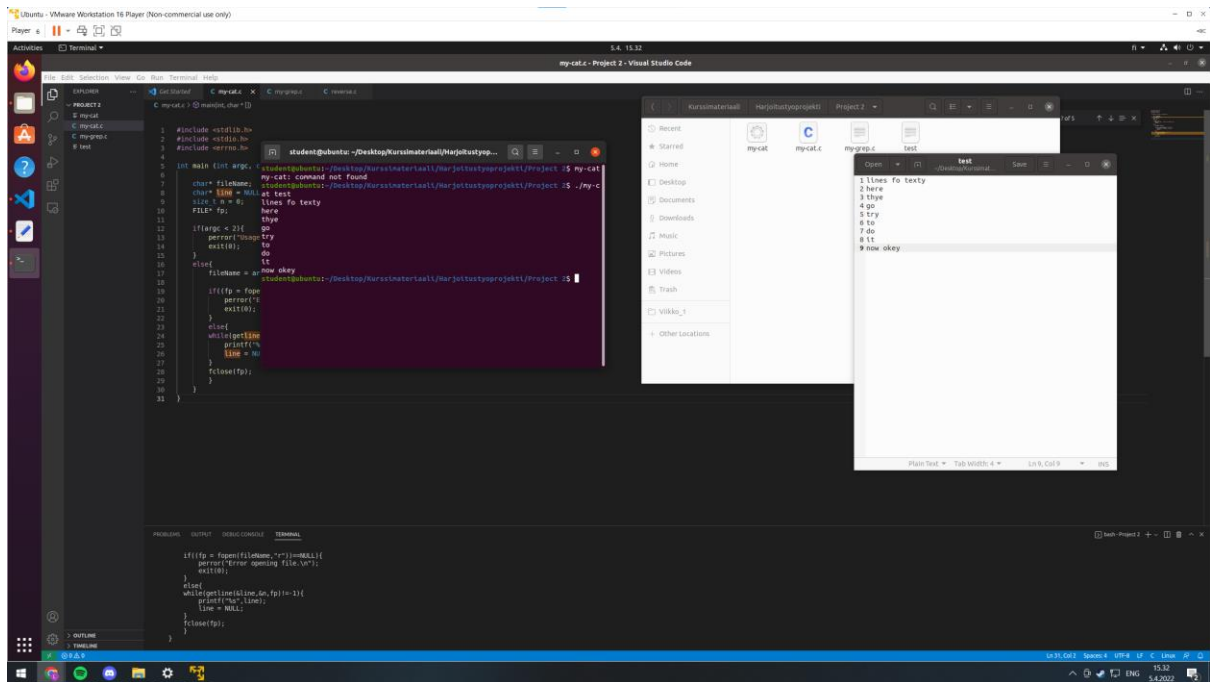


Figure 1 testing my-cat

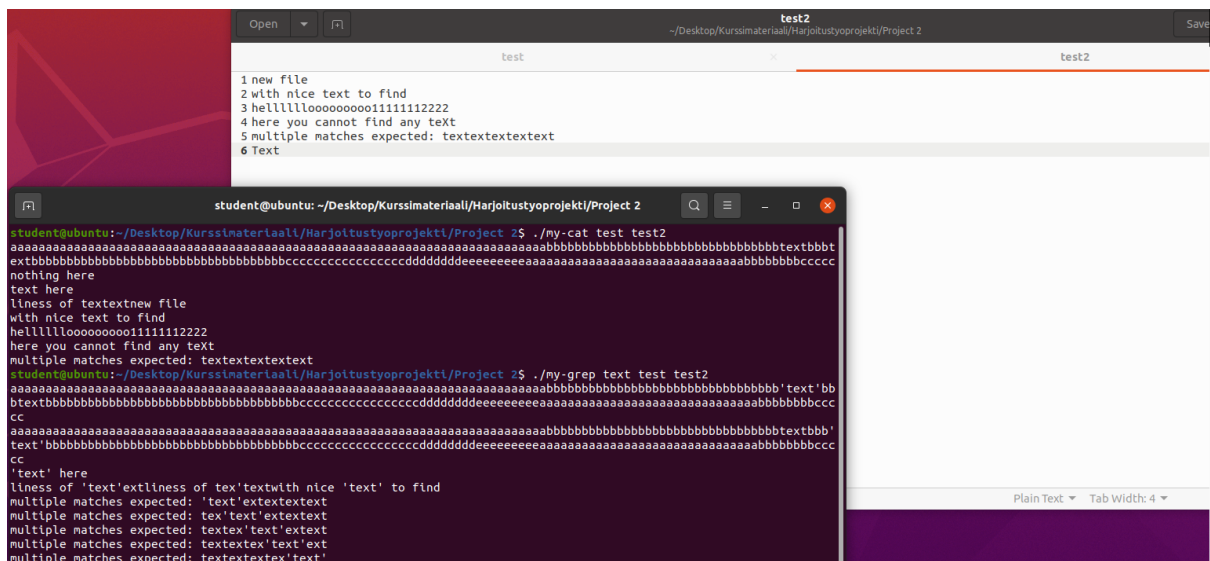


Figure 2 Using my-grep and my-cat with multiple files in bash.

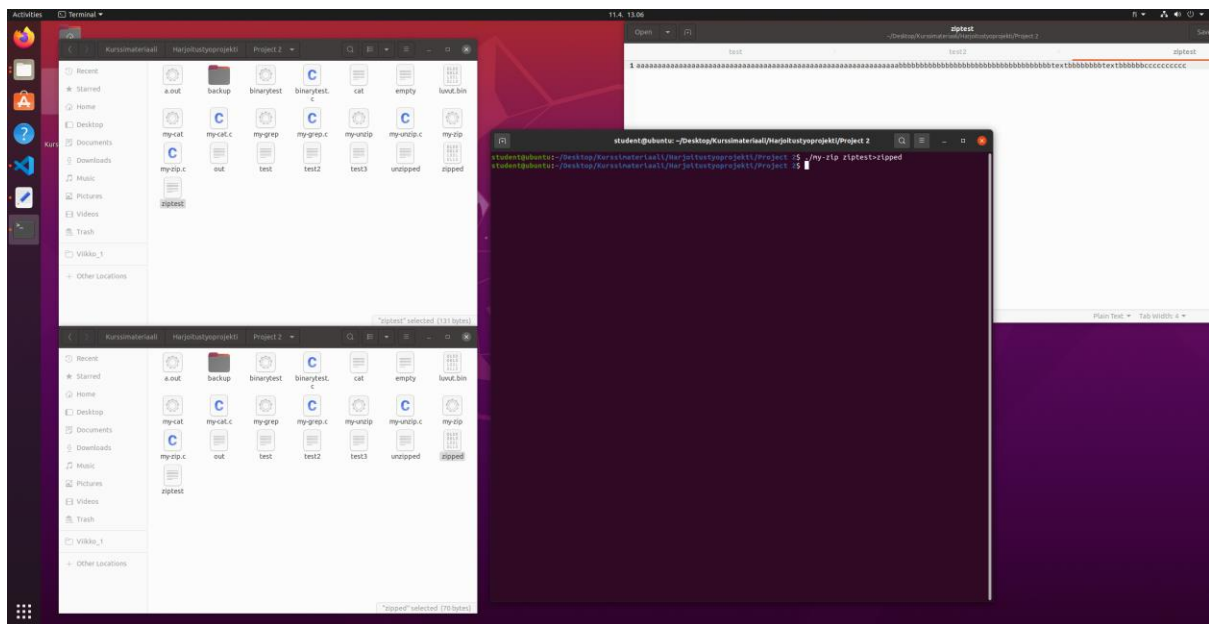


Figure 3 Using my-zip to reduce the filesize of "zipdest" from 131 bytes to 70 bytes.

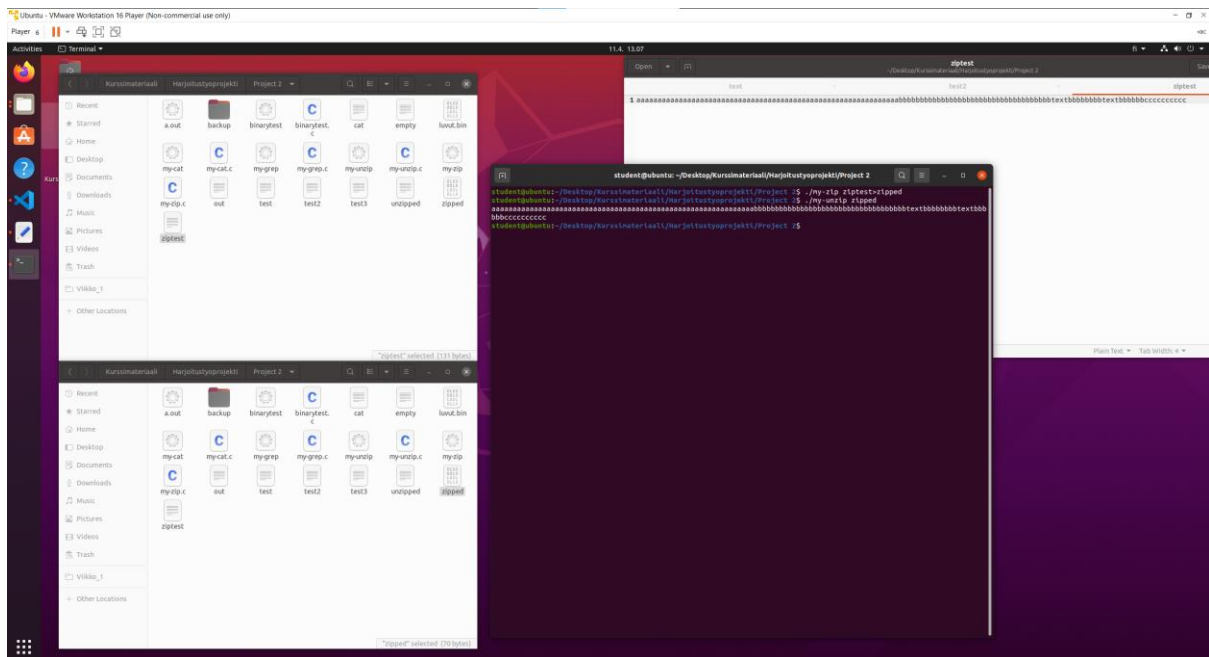


Figure 4 Using my-unzip to print out the contents of the compressed file 'zipdest' to the terminal

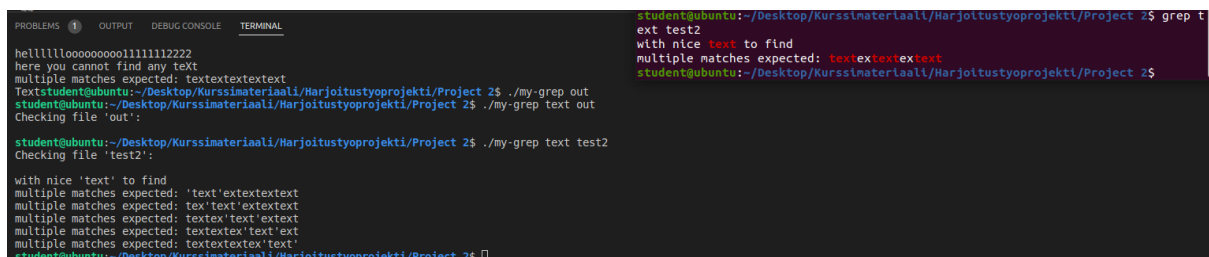


Figure 5 Comparing my-grep and grep

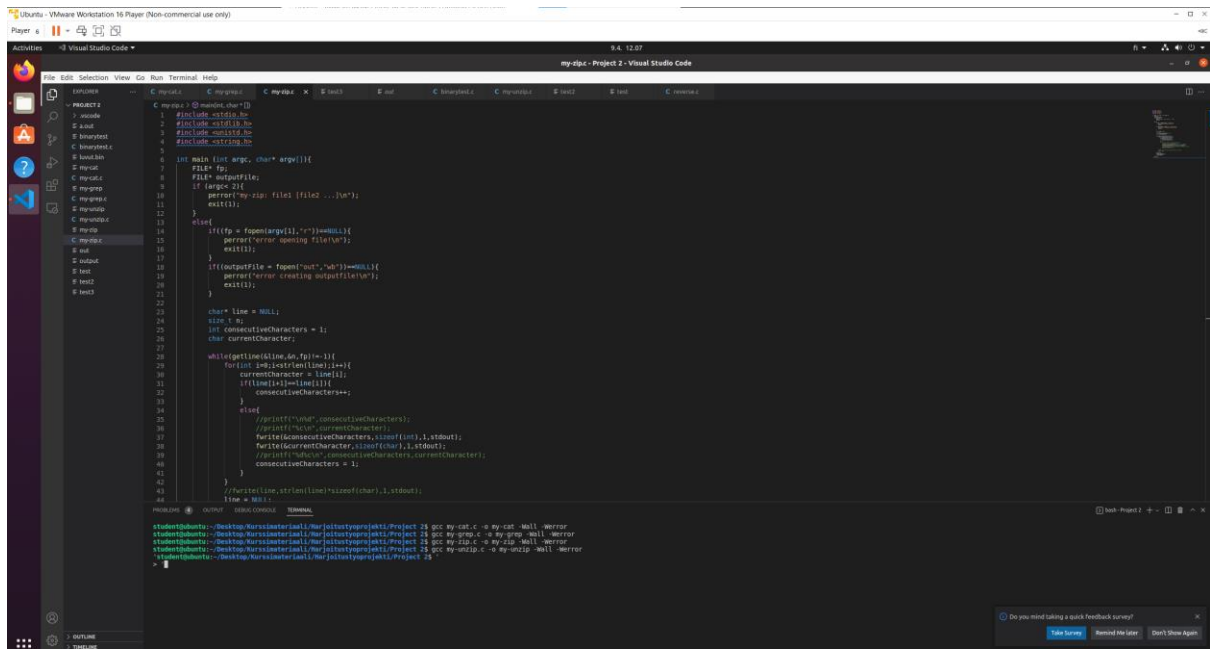


Figure 6 All utilities compiled