

## Hardware programming 2

### Complex practicing task

Write a C program, which 'code/encrypt' a text file according to follows:

1. When the program is executed by “-c” command line argument it code/encrypt the chosen file. If the command line argument of the program is “-d” then the program decode/decrypt the (probably coded) chosen file. If there isn't any command line argument or it is not one of the above two, then the program prints out a message to the standard error interface and then terminates returning by “1” as an error code.
2. The source should be one of the files in the home directory of the actual user. So the program first displays the names of all (but only) the regular files in the folder specified by the HOME environmental variable. After this the program waits for the response of the user, reading the chosen filename from the standard input as a text. If the given string is not an existing file of the directory (e.g. typing mistake) the program has to ask a new choice, else the string contains the filename for the further operation.
3. Coding and decoding are implemented by procedures organized into a separate header file called “secret.h”. Coding process: all the characters of the input file must be modified swapping its first two bits and the last two bits. Then the program inserts an extra random English letter after all the previously coded byte. Of course the decoding process is the opposite. So all the even characters of the decoded file is removed and the first two and the last two bits of the odd characters are swapped. Use binary file handling.
4. The input and the output file has to have the same name. To do this you have to use a temporary file.
5. During the file processing avoid reading single characters because it is not effective. Instead, use a buffer (character array). The size of the buffer have to be equal to the value stored in the block size filed of the inode related to the input file. The buffer is allocated by dynamic memory handling.
6. The first 10 seconds of the coding/decoding process has to be not interruptable by pushing ctrl+c keyboard combination.
7. The program has to be effective, reliable, short and clear.
8. (Make documentation: comments, user manual, etc.)