sysjm

Description of the Program

CODING1

Program for En- / Decoding „on Place“

User Manual

Dipl.-Math. Jürgen Müller

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1 Description of the necessary Parameters of the Program CODING1

1.1 Starting

You can directly call the program CODING1.EXE out of MS Windows (i.e. by double click), whereupon the program is started in a DOS box.

1.2 Language

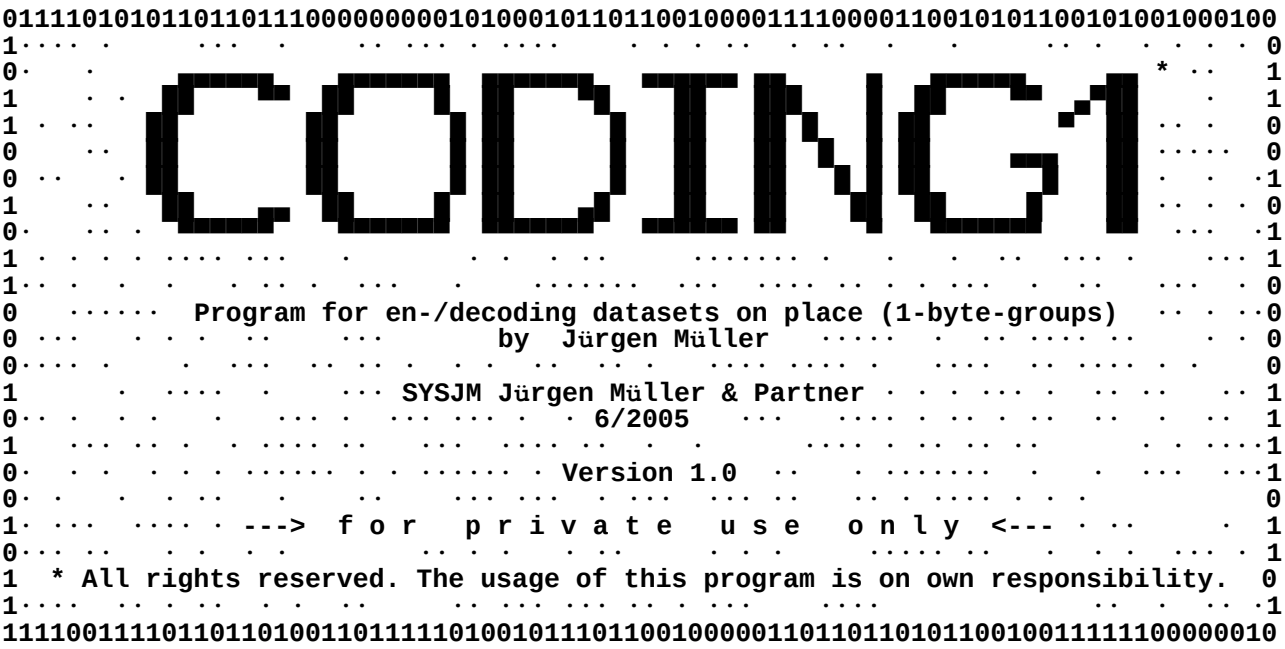
First you are asked for the language the following dialog takes place:

```
Language / Sprache:
  English    --> 0
  Deutsch    --> 1
```

Enter the digit corresponding the language you want to have.

1.3 Identification

It follows the information of the identification page of CODING1:



1.4 Restrictions

Please heed that the existing version does not entitle to commercial use. If you need this program (or one of the programs using higher safety) for commercial usage, please turn to the author reachable under contact data at the end of this manual. Many thanks.

Please heed too that there is no absolute guarantee for the program in spite of highest quality check. If, in contrary to expectations, problems will be arise, which provable are not caused by wrong services, the author immediately will try hard to solve the problem. Naturally your ideas to the program, the documentation, etc. are welcome every time.

Using the CODING method (see outline) there is **no** possibility **at all** to get a lost key so it is for the author (!). Please in case of doubt as a precaution use key datasets (see below) to avoid such problems.
Many thanks to your comprehension.

Any **separate dataset** has to be **smaller than 4 GB** to be processed correctly.

1.5 Common Things

After that you can finish the program during the input of program parameters every time by entering the value ‘9’ or without input of further characters by pressing the RETURN(¿) button (‘empty input’), so no dataset will be encoded or decoded.

Entering overloading information (see below) also the values ‘0’ and ‘-1’ can do so in individual case.

You finish every input by pressing the RETURN(¿) button as usual.

1.6 Output Dataset for Control Information

After the short display of the identification page, the program asks you for a dataset receiving control information:

```
Please enter the name of the dataset for control information
 (empty input terminates the program):
```

Here you enter a dataset name with path information, if necessary, for a new or able to overwrite dataset, which includes all relevant information (except of course security information !) of chosen parameters and of done program tasks.

The program works with the OEM character set (MS-DOS character set), it doesn’t work with the ANSI character set (MS Windows), which is taken into account reading this dataset later.

1.7 Output of the Command Line Control Parameters

Now you can print out the detailed description of the control parameters in the command line calling the program into this output dataset for control information:

```
Shall a parameter description of this program be written
 to this dataset for control information ?
   0    - no, the program has to continue,
   1    - yes, after that the program has to continue,
   2    - yes, after that the program has to terminate.
Please enter the corresponding number:
```

This happens with the values '1' and '2', the value ’0’ skips this output. The values '0' and '1' continue the program.

1.8 Information to the processed Datasets

If you continue the program, you are asked in which form you want to give the dataset(s), which shall be encoded or decoded:

```
Which datasets shall be processed?
   1  one dataset and all datasets addressed by wild cards respectively,
      which name is given in the following input
   2  all datasets (possibly addressed by wild card information),
      which names are listed in the dataset given in the following input
   3  all datasets of the directory given in the following input
   4  all datasets of the directory given in the following input
       a n d  these of all subdirectories of lower levels
   9  terminate the program.
Please enter the corresponding number:
```

Entering the value ’1’ you can give the dataset or datasets processed in the following with path information, if necessary, in a direct way, where you can use the special character ‘?’ for any character and ’*****’ for any group of characters in a dataset name („wild-card information“) as usual in MS-DOS to choose many datasets.

Entering the value ‘2’ tells the program, you want to give a dataset in the following, which itself covers dataset information with one dataset per line identifying datasets to process. I.e. you have prepared a dataset with dataset information of that datasets, which shall be processed in the actual run.

In many cases you want to process all datasets of a directory or of a directory **a n d** all subdirectories of any level. This is possible by entering the value ‘3’ for datasets of exactly one directory and by entering the value ‘4’ for all datasets within a directory tree. In these cases the program in the following asks you for the directory name, which can be completed by path information as known by MS-DOS.

Depending on the input value you are asked as follows:
’1’:

```
  Please enter the identification of the dataset(s), which shall be processed
   (empty input terminates the program):
```

’2’:

```
  Please enter the name of the dataset, in which the names
   of all datasets to process are listed
   (empty input terminates the program):
```

’3’, ’4’:

```
  Please enter the name of the directory,
   which contains the datasets to process
   (empty input terminates the program):
```

1.9 Processing Form

Because of that the datasets which shall be processed are fixed. But the question is, in which form this shall take place:

```
  In which form the dataset(s) shall be processed?
     1  encoding of single dataset(s)
     2  decoding of single dataset(s)
     3  encoding of dataset(s) as  o n e  unit
     4  decoding of dataset(s) as  o n e  unit
     9  terminate the program.
  Please enter the corresponding number:
```

The terms „encoding“ and „decoding“ are self-explanatory (although these operations can be switched (!)). But the question, what means encoding “as one unit”, is safety relevant.

First of all single encoded datasets can be decoded separate independent of other datasets. This is impossible if datasets are encoded as one unit (!). In this case only exactly these datasets encoded as one unit can be decoded as a whole.

The advantage of encoding datasets as one unit is not to put back the internal key parameters for every dataset. Rather all involved datasets are handled as one big dataset, so decoding tests of unauthorised persons are made much more difficult.

As disadvantage encoded directories may **n o t** be modified or modifications have to lead back exactly before decoding. This can be done by entering all dataset names in the order of encoding (for example see the output dataset for control information) in a separate dataset covering dataset information (see above). Therefore the existing program only works on the contents of datasets, it doesn’t modify directory or similar information.

1.10 Key Information

The following information concerns all facts which are something to do with the key:

1.10.1 Character Set

```
Which character set you want to choose to enter the key?
   1  ASCII characters (max. 256 characters)
   2  hexadecimal characters
      (max. 512 characters "0" to "9" and "A" to "F" respectively)
   9  terminate the program.
Please enter the corresponding number:
```

In this dialog it's about the character set to enter and read in key information. To get the possibility to enter all possible characters apart from the "normal" character set (ASCII character), which can be entered by the keyboard, you can choose another character set (hexadecimal character), so any two characters of which are combined to one key character by the program. With that key characters can be generated which can not or laboriously generated in a direct way by keyboard buttons. Users not being familiar with that first shall do without this.

1.10.2 Input Mode

```
In which way you want to enter the key?
   0  twice via keyboard  w i t h o u t  echoing the input on the screen
       (second time for controlling!)
   1  once via keyboard  w i t h  screen control
   2  via a dataset containing the key
   9  terminate the program.
Please enter the corresponding number:
```

1.10.3 Keyboard Input

If you want to enter the key characters by keyboard, you get the possibility with (mode='1'):

```
Please enter your key in hexadecimal/ASCII characters
 (end of key: press only return-button in line):
```

or with (mode='0'):

```
Please enter your key in hexadecimal/ASCII characters
 (end of key: press only return-button in line) once:
```

and:

```
Please enter your key in hexadecimal/ASCII characters
 (end of key: press only return-button in line) twice (control input):
```

1.10.4 Input via Key Dataset

If you want to use a dataset comprising the key (mode='2') with:

```
In which way you want to enter the dataset name containing the key?
   0  twice via keyboard  w i t h o u t  echoing the input on the screen
       (second time for controlling!)
   1  once via keyboard  w i t h  screen control
   9  terminate the program.
Please enter the corresponding number:
```

you are asked first the kind of input of the name of the dataset comprising the key. At second with:

```
Please enter the name of the dataset containing the key
  (empty input terminates the program):
```

or with:

```
Please enter the name of the dataset containing the key the first time
 (empty input terminates the program)
```

and:

```
Please enter the name of the dataset containing the key the second time
 (control input):
```

the dataset name is asked.

1.10.5 Key Character Handling

Use key datasets if you have a complex or randomised key. A key dataset used by the current program task is n o t processed in this task (so not destroyed as well) even if this dataset is explicitly or implicitly addressed as a dataset to be processed (!). This statement is also true for overlay datasets (see below), the output dataset for control information, the dataset covering dataset names as well as the module dataset of the program itself (each see below) if really used in the task.

In principle all special characters excepting line end characters (mostly generated by RETURN(¿) button or <carriage return><line feed> or $0D_{hex}$ plus $0A_{hex}$ character) are interpreted as components of a key of ASCII characters. During the key input entering hexadecimal characters line end characters may also be used to split key information to more than one line. Entering key information line end characters in general are ignored or interpreted as end of key information if combined with an empty line in conjunction with input by the keyboard.

If a key covers more than 256 key characters the surplus characters are ignored. If on the other hand less than 256 key characters are given, then the given key characters are duplicated and the result string is truncated to 256 characters for further use. Nevertheless you shan't choose to less and homogeneous characters as key characters, because this, in extreme case (e.g. only hexadecimal null characters!), could be result in no encoding.

Not having a rare extreme case the results of encoding, also using short keys, have no characteristics with regard to the key length at all (!). Simply by searching the key a third person probably first will test a shorter key, before it takes a longer input key into account – and then gives up.

1.11 Real Program Processing

If you answer the question about the so-called "overlay information" (see below) with the value '0' the program starts working (e.g.):

```
Begin of process: Th. 31.03.2005, 19:26:33.
```

For this reason the program is further **n o t** interruptible (!). Because all datasets are directly processed (no copies are generated at all), an interrupt **irretrievably destroys (!)** one or more datasets, i.e. you **absolutely** have to make **backup copies** e.g. on other storage media (!). In success these copies can be replaced by the encoding results to get protection against troubles during decoding.

During the processing the names of all processed datasets and directories are written to the screen and to the control dataset (see above), so every step can be controlled by you actual and later.

The program leaves by writing short statistics, the processing end message, and the terminate message (i.e.)

```
    212430600 bytes in       54 dataset(s) in      9 directories processed.
End of process: Th. 31.03.2005, 19:28:03.

En-/decoding program  C O D I N G 1  1.0  terminated.
```

.

2 Description of Overlay Information of the Program CODING1

The following information refers to the so-called “overlay information”, which in most cases is not needed (value ’0’ below).

“Overlay” means the possibility to modify a key manually or by a second dataset in a specific way. Changes can be restricted to definite positions in the key, to particular key values, and to certain changing values inside the overlay information.

With that using a serial byte string, it is possible to use a second dataset, the overlay dataset, to overwrite values at “chance” positions in the present key by “chance” values derived by the overlay dataset.

2.1 Overlay Information

In general every single overlay information is constructed by two values:

- the position value and
- the value which the overlay value is derived from.

Using a serial byte string (“direct mode”) each information consists of two character values formed by two characters being behind one another inside any dataset or inside any input character string (value ’7’ below). In all other cases the information has to be like this:

```
Is the initial key to be overlaid?
   0   no, no overlay of the initial key
   1   yes, in form of "<byteno-dec>:<charactr>,"
   2   yes, in form of "<byteno-dec>:<hexvalue>,"
   3   yes, in form of "<byteno-dec>:<decvalue>,"
   4   yes, in form of "<byteno-hex>:<charactr>,"
   5   yes, in form of "<byteno-hex>:<hexvalue>,"
   6   yes, in form of "<byteno-hex>:<decvalue>,"
   7   yes, in form of a serial byte string
   9   terminate the program.
Please enter the corresponding number:
```

Herein is

’byteno-dec/-hex’	a decimal or hexadecimal number of the referred key position in the interval of 1 to 256 or 1 to100_{hex},
’charactr’	any character,
’hexvalue’	a value in the interval of 0 to FF consisting of hexadecimal half byte characters of 0 to 9 and A to F,
’decvalue’	a decimal value in the interval of 0 to 255.

2.2 Position Interval

```
Please enter the lower and the upper limit of positions in the key,
 which may be changed by overlay information:
  lower limit of positions (1 to 256 (0=termination)):
```

and

```
  upper limit of positions (nnn to 256 (0=termination)):
```

This information fixes the positions overlay information has to refer to, to be potentially significant for changing the key. Only if the following overlay value interval information and the following key value interval information additionally come true, an overlay information really takes to overlay a key position by a value given by this overlay information.

Changes only take place at the positions of the position interval in principle.

2.3 Overlay Value Interval

```
Please enter the lower and upper limit of values
 of overlay information the key may be changed by (in decimal form):
  lower limit of values (0 to 255 (-1=termination)):
```

and

```
  upper limit of values (nnn to 255 (-1=termination)):
```


This information fixes the values of the overlay information potentially being relevant for changing the key. Only if the position interval information described before and the following key value interval information additionally come true, an overlay information really takes to overlay a key position by a value given by this overlay information.

2.4 Key Value Interval

```
Please enter the lower and upper limit of key values
 that may be changed by overlay information (in decimal form):
  lower limit of key values (0 to 255 (-1=termination)):
```

and

```
  upper limit of key values (nnn to 255 (-1=termination)):
```

This information fixes the values of the key information potentially being relevant for changing. Only if the position interval information described before and the overlay value interval information described before additionally come true, an overlay information really takes to overlay a key position by a value given by this overlay information.

Doing this in general it is possible that a position in the key can be overloaded repeatedly. After overlaying a position in fact the overlay value is the new key value for the further overlay processing. The last overlay information applied to a position decides the value being the final key value at this position.

Carrying out overlay processing an input value or a dataset value first is transformed by

*overlay value := (input-/dataset-value + present key value * 113*
+ key value at previous position or at position 256 for position 1) modulo 256

before the result-value is used as actual overlay value.

Position, overlay value, and key value interval information are of main interest to overlay datasets in direct mode. In direct mode **every** dataset can be set as an overlay dataset, program module datasets (*.COM, *.EXE) and other binary datasets too (!).

In general you have to observe that for all positions in the position interval **in connection with an overlay dataset varying in any kind and being (nearly) infinitely long** the following is valid:

As a result the key values of the key value interval are (almost) entirely transformed to overlay values of the overlay value interval.

If there are overlay values not belonging to the key value interval, the following **more restricted rule** is valid:

As a result all the key values are (almost) entirely transformed to overlay values of the overlay value interval, which are not part of the key value interval (!).

The better an overlay dataset complies with these rules, all the more the named conclusions are valid. That must be taken into account to avoid trivial keys !

Given an initial key, an overlay dataset, and an overlay value interval the **following is valid in general**:

Any key value interval covering this overlay value interval provides the same result key, if no key value being element of the key value interval but not being element of the overlay value interval is found in the initial key.

2.5 Input Mode

```
In which way you want to enter the overlay information?
   0  twice via keyboard  w i t h o u t  echoing the input on the screen
       (second time for controlling!)
   1  once via keyboard  w i t h  screen control
   2  via a dataset containing the overlay information
   9  terminate the program.
Please enter the corresponding number:
```


2.6 Keyboard Input

If you want to enter the overlay information by keyboard, you get the possibility depending on the type of information with:

'1':
```
Please enter the overlay information in form of "<byteno-dec>:<charactr>,"
```
'2':
```
Please enter the overlay information in form of "<byteno-dec>:<hexvalue>,"
```
'3':
```
Please enter the overlay information in form of "<byteno-dec>:<decvalue>,"
```
'4':
```
Please enter the overlay information in form of "<byteno-hex>:<charactr>,"
```
'5':
```
Please enter the overlay information in form of "<byteno-hex>:<hexvalue>,"
```
'6':
```
Please enter the overlay information in form of "<byteno-hex>:<decvalue>,"
```
'7':
```
Please enter the overlay information in form of a serial byte string
```
each with
```
   (end of overlay information: press only return-button in line):
```
or
```
   (end of overlay information: press only return-button in line) once:
```
or
```
   (end of overlay information: press only return-button in line) twice
                                                          (control input):
```

2.7 Input via Overlay Dataset

If you want to use an overlay dataset with:

```
In which way you want to enter the dataset name
containing the overlay information?
   0  twice via keyboard  w i t h o u t  echoing the input on the screen
       (second time for controlling!)
   1  once via keyboard  w i t h  screen control
   9  terminate the program.
Please enter the corresponding number:
```

you are asked first the kind of input of the name of the overlay dataset. At second with:

```
Please enter the name of the dataset containing the overlay information
 (empty input terminates the program):
```

or with:
```
Please enter the name of the dataset containing the overlay information
 the first time (empty input terminates the program):
```

and:
```
Please enter the name of the dataset
 containing the overlay information the second time (control input):
```

the dataset name is asked.

2.8 Overlay Information Processing

For the most part it recommends to use an overlay dataset if you have many overlay information. An overlay dataset used by the current program task is n o t processed in this task (so not destroyed as well) even if this dataset is explicitly or implicitly addressed as a dataset to be processed (!).

During the overlay information input line end characters may also be used to split overlay information to more than one line. Entering overlay information line end characters in general are ignored or interpreted as end of overlay information if combined with an empty line in conjunction with input by the keyboard.

The processing of overlay information is closed by the message:

```
End of input of the overlay information.
```


3 Contact Data

Address:
SYSJM Jürgen Müller & Partner
Mauerstr. 26
D-64289 Darmstadt

Email-address:
info@sysjm.de
Web-address:
www.sysjm.de

Telephone:
+49 (0)6151 / 71 51 42
Fax:
+49 (0)6151 / 71 02 42