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```
one line to give the program's name and a brief idea of what it does.  
Copyright (C) 19yy name of author
```

```
This program is free software; you can redistribute it and/or modify  
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the Free Software Foundation; either version 1, or (at your option)  
any later version.
```

```
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Foundation, Inc., 675 Mass Ave, Cambridge, MA 02139, USA.
```

Also add information on how to contact you by electronic and paper mail.

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```
Gnomovision version 69, Copyright (C) 19yy name of author  
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type 'show w'.  
This is free software, and you are welcome to redistribute it  
under certain conditions; type 'show c' for details.
```

The hypothetical commands ‘show w’ and ‘show c’ should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than ‘show w’ and ‘show c’; they could even be mouse-clicks or menu items—whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a “copyright disclaimer” for the program, if necessary. Here a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the  
program 'Gnomovision' (a program to direct compilers to make passes  
at assemblers) written by James Hacker.
```

```
signature of Ty Coon, 1 April 1989  
Ty Coon, President of Vice
```

That's all there is to it!

1 General introduction to GNU sort.

This is an MS-DOS port of the (unreleased) external sort program for the GNU project, written by Mike Haertel.

- **PLEASE NOTE:** Mike Haertel (the original author) allowed me to distribute this program under the condition that I make clear that this program has not been tested extensively and is to be considered as in a pre-alpha test state.

I have decided to distribute this program anyway, because it outclasses *any* external sort program I have seen for MS-DOS: both in performance and functionality.

- Performance:
 1. When used with a fast (preferably cached) disk, this program is as fast as V. Buerg's `sortf` (if the latter is used with large, non default keys, GNU `sort` is *considerably* faster).
 2. There are (almost) no build-in hard limits! (I have put one hard and one soft limit in the MS-DOS version, see Chapter 4 [MS-DOS], page 9).
- Functionality:
 1. GNU `sort` works as a filter.
 2. GNU `sort` has lots of **useful** options (see Chapter 3 [Options], page 8).

This distribution is different from the other ports of GNU software for MS-DOS: it contains the full, unabridged source code and no context diffs. This is because GNU `sort` has not yet been released by the Free Software Foundation, and therefore you can't pick up the official source from prep. But: **all** changes (which are very few) are conditionalized with `MSDOS`.

Please send bug reports (preferably with fixes (**context diff**'s!)) to

Thorsten Ohl
<td12@ddagsi3.bitnet>

I can make no promises to fix it immediately, but I might want to!

2 How to install the MS-DOS version of GNU sort.

1. Edit the following variables in the makefile

LIBS Remove `glob.obj`, `msd_dir.obj`, and `_cwild.obj` if you don't have `glob.c`, `msd_dir.c`, `msd_dir.h`, and `_cwild.c` from the other MS-DOS ports (e.g. `fileutils`), or if you do not want a reasonable filename globbing.

VPATH Include path for `glob.c`, `msd_dir.c`, `msd_dir.h`, and `_cwild.c` on *your* system. If you have a loosing (non GNU) `make` that doesn't understand `VPATH`, copy the sources in your current directory.

CFLAGS, LDFLAGS

These are for the Microsoft C compiler Version 6.0, edit them for your system:

`-AC` Compact memory model

`-W4` Full warnings!

`-Ocgilt` (Almost) maximal optimization.

`-Za`

`-DSTDC_HEADERS`
ANSI C.

`-DUSG` Microsoft's C looks more like System V than BSD.

`/e` Pack the executable.

`/st:0x8000`
Large stack.

`/noe` If duplicate symbols in object files and libraries, use the one from the object file.

2. Say `make`.

That's all.

3 Options for GNU sort

```
sort [-cmuV] [-t c] [-o file] [-T dir]
      [-bdfiMnr] [+n [-m] ...] [file ...]
```

The following is a guide to GNU `sort`, *not* a collection of *documented options* that can be relied on.

3.1 Options affecting all sort keys

- '-c' Check sort order only.
- '-m' Merge presorted files (avoids resorting of already sorted files, which is generally a slow operation).
- '-ofile' Send output to `file` (overwriting).
- '-tc' Use `c` as field separator.
- '-Tprefix' Use `prefix` as prefix for temporary files (e.g. `prefix/sort3141.137`), default is '\$TMP'.
- '-u' Delete duplicate lines from the output.
- '-V' Print the version string

See Section 3.3 [Local], page 8, for more options that can affect all keys.

3.2 How to specify the sort keys

Keys are zero based, thus the first field has number 0, and so on.

- '+num1.num2' Start a new key at character `num2` of field `num1`.
- '-num1.num2' Extend the key upto (not including) character `num2` of field `num1`.

3.3 Options affecting one or all sort keys

These option apply either globally to all sort keys (if they are specified before the keys on the command line), or to a single key (if they are appended to the key specification).

- '-b' Skip white space.
- '-d' Dictionary mode: ignore punctuation.
- '-f' Fold to lowercase.
- '-i' Ignore nonprinting characters.
- '-M' Sort as english (three character) month names.
- '-n' Sort numerically.
- '-r' Sort in reverse.

4 How the MS-DOS version differs

- The maximum line length has been reduced to 32k. While the introduction of arbitrary upper limits is alien to the GNU project, this particular limit seems to be o.k. for MS-DOS applications and tremendously decreases the number of required changes in the original source.
- The maximum number of lines per input buffer is restricted to about 4000. This limit can only be reached by files with an average linelength smaller than 8 characters. To allow the sorting of such files, the following option has been included to reduce the input buffer size:

‘-S *num*’ Set the input buffer size (default 32k) to num.