The sort command ('sort' [-ordering option] [file]) will sort, merge, or sequence check some text files (.txt format) or will read standard input if no files are given.  You can sort a file in ascending or  descending order, alphabetical order, or by columns, tabs and colons and more. The sort can be performed on any file as long as the contents are in Ascii format. Numbers can be sorted with the -n option (numerical sort). Sort can also be performed on multiple files which will result in the sorted and merged values from all input files.

From the source code it seems like  sort uses a few different data structures including queue and binary merge tree and has a lot of fork() and PID action. Also I noticed that it also follows the POXIS behavior so non-POSIX locales may produce unexpected output. I did a search for sort unix bugs and found that most people were having problems because their locales (LC_ALL=C) were not set correctly so they thought that something was wrong with sort. I used coreutils-8.22.

Results from running coreutils 8.22 test suite:

```
============================================================================
Testsuite summary for GNU coreutils 8.22
============================================================================
# TOTAL: 551

# PASS:  425

# SKIP:  116

# XFAIL: 0

# FAIL:  6

# XPASS: 0

# ERROR: 4
============================================================================
```

I worked from the CADE machines and found that the version of sort was 1.22 and when I tried to make with 8.22 I got a bunch of errors about an undefined reference to "gmpz_inits" and "gmpz_clears" in the factor.c file so I tried deleting the file but that didn't work. I am not sure what gmpz (GMP) is or how to fix this problem so I just tested with the 1.22 version on the CADE machines.

I made a few different text files that correctly worked with sort and then used the fuzzer from class and flipped 10, 100, and 500 bits and checked if the output matched the original and/or didn't break. For flipping 10 bits most of the results were the same, for 100 bits the results looked pretty different, and for 500 were very different. I think the 1.22 version of sort isn't very good, but I am not sure how different 8.22 is because I couldn't find source code for 1.22. I probably wouldn't recommend using version 1.22 of sort.


Result from "valgrind –leak-check=yes sort":
ERROR SUMMARY: 13 errors from 9 contexts (suppressed: 0 from 0)
errors included: conditional jump or move depends on uninitialized values(s)