A screen shot of a computer program

Description automatically generated

A screenshot of a computer program

Description automatically generated

nmaddali@LAPTOP-DS4255RO:~/klee$ docker run --rm -ti --ulimit='stack=-1:-1' klee/klee

klee@34885d4a04d1:~$ ls -la

total 40

drwxr-x--- 1 klee klee 4096 Oct 1 14:30 .

drwxr-xr-x 1 root root 4096 Oct 1 14:25 ..

-rw-r--r-- 1 klee klee 220 Jan 6 2022 .bash\_logout

-rw-r--r-- 1 klee klee 3822 Oct 1 14:31 .bashrc

drwxr-xr-x 3 klee klee 4096 Oct 1 14:29 .cache

drwxr-xr-x 4 klee klee 4096 Oct 1 14:29 .local

-rw-r--r-- 1 klee klee 807 Jan 6 2022 .profile

-rw-r--r-- 1 klee klee 170 Oct 1 14:27 .wget-hsts

lrwxrwxrwx 1 klee klee 24 Oct 1 14:30 klee\_build -> /tmp/klee\_build130stp\_z3

lrwxrwxrwx 1 klee klee 13 Oct 1 14:30 klee\_src -> /tmp/klee\_src

klee@34885d4a04d1:~$ whoami

klee

klee@34885d4a04d1:~$ klee --version

KLEE 3.1-pre (https://klee.github.io)

Build mode: RelWithDebInfo (Asserts: TRUE)

Build revision: 9edf8e8bba51f2d217ead0a9b2469b0b551ad255

LLVM (http://llvm.org/):

LLVM version 13.0.1

Optimized build with assertions.

Default target: x86\_64-unknown-linux-gnu

Host CPU: tigerlake

klee@34885d4a04d1:~$ clang --version

clang version 13.0.1 (https://github.com/llvm/llvm-project.git 75e33f71c2dae584b13a7d1186ae0a038ba98838)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /tmp/llvm-130-install\_O\_D\_A/bin

klee@34885d4a04d1:~$ ls -la

total 40

drwxr-x--- 1 klee klee 4096 Oct 1 14:30 .

drwxr-xr-x 1 root root 4096 Oct 1 14:25 ..

-rw-r--r-- 1 klee klee 220 Jan 6 2022 .bash\_logout

-rw-r--r-- 1 klee klee 3822 Oct 1 14:31 .bashrc

drwxr-xr-x 3 klee klee 4096 Oct 1 14:29 .cache

drwxr-xr-x 4 klee klee 4096 Oct 1 14:29 .local

-rw-r--r-- 1 klee klee 807 Jan 6 2022 .profile

-rw-r--r-- 1 klee klee 170 Oct 1 14:27 .wget-hsts

lrwxrwxrwx 1 klee klee 24 Oct 1 14:30 klee\_build -> /tmp/klee\_build130stp\_z3

lrwxrwxrwx 1 klee klee 13 Oct 1 14:30 klee\_src -> /tmp/klee\_src

klee@34885d4a04d1:~$ mkdir work

klee@34885d4a04d1:~$ cd work

klee@34885d4a04d1:~/work$ mkdir tutorial1

klee@34885d4a04d1:~/work$ cd tutorial1

klee@34885d4a04d1:~/work/tutorial1$ touch test.c

klee@34885d4a04d1:~/work/tutorial1$ vln test.c

bash: vln: command not found

klee@34885d4a04d1:~/work/tutorial1$ vlm test.c

bash: vlm: command not found

klee@34885d4a04d1:~/work/tutorial1$ vim test.c

klee@34885d4a04d1:~/work/tutorial1$ clang -emit-llvm -00 -c -g test.c

clang-13: error: unknown argument: '-00'

klee@34885d4a04d1:~/work/tutorial1$ clang -emit-llvm -O0 -c -g test.c

test.c:13:2: warning: implicit declaration of function 'klee\_make\_symbolic' is invalid in C99 [-Wimplicit-function-declaration]

klee\_make\_symbolic(&a, sizeof(a), "a");

^

1 warning generated.

klee@34885d4a04d1:~/work/tutorial1$ ls -la

total 16

drwxr-xr-x 2 klee klee 4096 Oct 1 14:51 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

klee@34885d4a04d1:~/work/tutorial1$ llvm-dis ./test.bc

klee@34885d4a04d1:~/work/tutorial1$ ls -al

total 24

drwxr-xr-x 2 klee klee 4096 Oct 1 14:52 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

-rw-r--r-- 1 klee klee 5270 Oct 1 14:52 test.ll

klee@34885d4a04d1:~/work/tutorial1$ klee test.bc

KLEE: output directory is "/home/klee/work/tutorial1/klee-out-0"

KLEE: Using STP solver backend

KLEE: SAT solver: MiniSat

KLEE: Deterministic allocator: Using quarantine queue size 8

KLEE: Deterministic allocator: globals (start-address=0x150f074cd000 size=10 GiB)

KLEE: Deterministic allocator: constants (start-address=0x150c874cd000 size=10 GiB)

KLEE: Deterministic allocator: heap (start-address=0x140c874cd000 size=1024 GiB)

KLEE: Deterministic allocator: stack (start-address=0x13ec874cd000 size=128 GiB)

KLEE: done: total instructions = 32

KLEE: done: completed paths = 3

KLEE: done: partially completed paths = 0

KLEE: done: generated tests = 3

klee@34885d4a04d1:~/work/tutorial1$ ls -la

total 28

drwxr-xr-x 3 klee klee 4096 Oct 1 14:55 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

lrwxrwxrwx 1 klee klee 10 Oct 1 14:55 klee-last -> klee-out-0

drwxr-xr-x 2 klee klee 4096 Oct 1 14:55 klee-out-0

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

-rw-r--r-- 1 klee klee 5270 Oct 1 14:52 test.ll

klee@34885d4a04d1:~/work/tutorial1$ klee test.bc

KLEE: output directory is "/home/klee/work/tutorial1/klee-out-1"

KLEE: Using STP solver backend

KLEE: SAT solver: MiniSat

KLEE: Deterministic allocator: Using quarantine queue size 8

KLEE: Deterministic allocator: globals (start-address=0x148c30abc000 size=10 GiB)

KLEE: Deterministic allocator: constants (start-address=0x1489b0abc000 size=10 GiB)

KLEE: Deterministic allocator: heap (start-address=0x1389b0abc000 size=1024 GiB)

KLEE: Deterministic allocator: stack (start-address=0x1369b0abc000 size=128 GiB)

KLEE: done: total instructions = 32

KLEE: done: completed paths = 3

KLEE: done: partially completed paths = 0

KLEE: done: generated tests = 3

klee@34885d4a04d1:~/work/tutorial1$ ls -la

total 32

drwxr-xr-x 4 klee klee 4096 Oct 1 14:57 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

lrwxrwxrwx 1 klee klee 10 Oct 1 14:57 klee-last -> klee-out-1

drwxr-xr-x 2 klee klee 4096 Oct 1 14:55 klee-out-0

drwxr-xr-x 2 klee klee 4096 Oct 1 14:57 klee-out-1

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

-rw-r--r-- 1 klee klee 5270 Oct 1 14:52 test.ll

klee@34885d4a04d1:~/work/tutorial1$ ls -la klee-out-1

total 48

drwxr-xr-x 2 klee klee 4096 Oct 1 14:57 .

drwxr-xr-x 4 klee klee 4096 Oct 1 14:57 ..

-rw-r--r-- 1 klee klee 5268 Oct 1 14:57 assembly.ll

-rw-r--r-- 1 klee klee 668 Oct 1 14:57 info

-rw-r--r-- 1 klee klee 446 Oct 1 14:57 messages.txt

-rw-r--r-- 1 klee klee 1468 Oct 1 14:57 run.istats

-rw-r--r-- 1 klee klee 8192 Oct 1 14:57 run.stats

-rw-r--r-- 1 klee klee 49 Oct 1 14:57 test000001.ktest

-rw-r--r-- 1 klee klee 49 Oct 1 14:57 test000002.ktest

-rw-r--r-- 1 klee klee 49 Oct 1 14:57 test000003.ktest

-rw-r--r-- 1 klee klee 0 Oct 1 14:57 warnings.txt

klee@34885d4a04d1:~/work/tutorial1$ ls -la

total 32

drwxr-xr-x 4 klee klee 4096 Oct 1 14:57 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

lrwxrwxrwx 1 klee klee 10 Oct 1 14:57 klee-last -> klee-out-1

drwxr-xr-x 2 klee klee 4096 Oct 1 14:55 klee-out-0

drwxr-xr-x 2 klee klee 4096 Oct 1 14:57 klee-out-1

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

-rw-r--r-- 1 klee klee 5270 Oct 1 14:52 test.ll

klee@34885d4a04d1:~/work/tutorial1$ ktest-tool klee-last/test000001.ktest

ktest file : 'klee-last/test000001.ktest'

args : ['test.bc']

num objects: 1

object 0: name: 'a'

object 0: size: 4

object 0: data: b'\x00\x00\x00\x00'

object 0: hex : 0x00000000

object 0: int : 0

object 0: uint: 0

object 0: text: ....

klee@34885d4a04d1:~/work/tutorial1$ ktest-tool klee-last/test000002.ktest

ktest file : 'klee-last/test000002.ktest'

args : ['test.bc']

num objects: 1

object 0: name: 'a'

object 0: size: 4

object 0: data: b'\x01\x01\x01\x01'

object 0: hex : 0x01010101

object 0: int : 16843009

object 0: uint: 16843009

object 0: text: ....

klee@34885d4a04d1:~/work/tutorial1$ ktest-tool klee-last/test000003.ktest

ktest file : 'klee-last/test000003.ktest'

args : ['test.bc']

num objects: 1

object 0: name: 'a'

object 0: size: 4

object 0: data: b'\x00\x00\x00\x80'

object 0: hex : 0x00000080

object 0: int : -2147483648

object 0: uint: 2147483648

object 0: text: ....

klee@34885d4a04d1:~/work/tutorial1$ export LD\_LIBRARY\_PATH=path-to-klee-build-dir/lib/:$LD\_LIBRARY\_PATH

klee@34885d4a04d1:~/work/tutorial1$ ls -la

total 32

drwxr-xr-x 4 klee klee 4096 Oct 1 14:57 .

drwxr-xr-x 3 klee klee 4096 Oct 1 14:39 ..

lrwxrwxrwx 1 klee klee 10 Oct 1 14:57 klee-last -> klee-out-1

drwxr-xr-x 2 klee klee 4096 Oct 1 14:55 klee-out-0

drwxr-xr-x 2 klee klee 4096 Oct 1 14:57 klee-out-1

-rw-r--r-- 1 klee klee 3308 Oct 1 14:51 test.bc

-rw-r--r-- 1 klee klee 176 Oct 1 14:48 test.c

-rw-r--r-- 1 klee klee 5270 Oct 1 14:52 test.ll

klee@34885d4a04d1:~/work/tutorial1$ cd ..

klee@34885d4a04d1:~/work$ cd ..

klee@34885d4a04d1:~$ cd klee\_src/examples/get\_sign

klee@34885d4a04d1:~/klee\_src/examples/get\_sign$ clang -emit-llvm -O0 -c -g get\_sign.c

klee@34885d4a04d1:~/klee\_src/examples/get\_sign$