Московский Авиационный Институт

(Национальный Исследовательский Университет)

Институт №8 “Компьютерные науки и прикладная математика”

Кафедра №806 “Вычислительная математика и программирование”

**Лабораторная работа №1 по курсу**

**«Операционные системы»**

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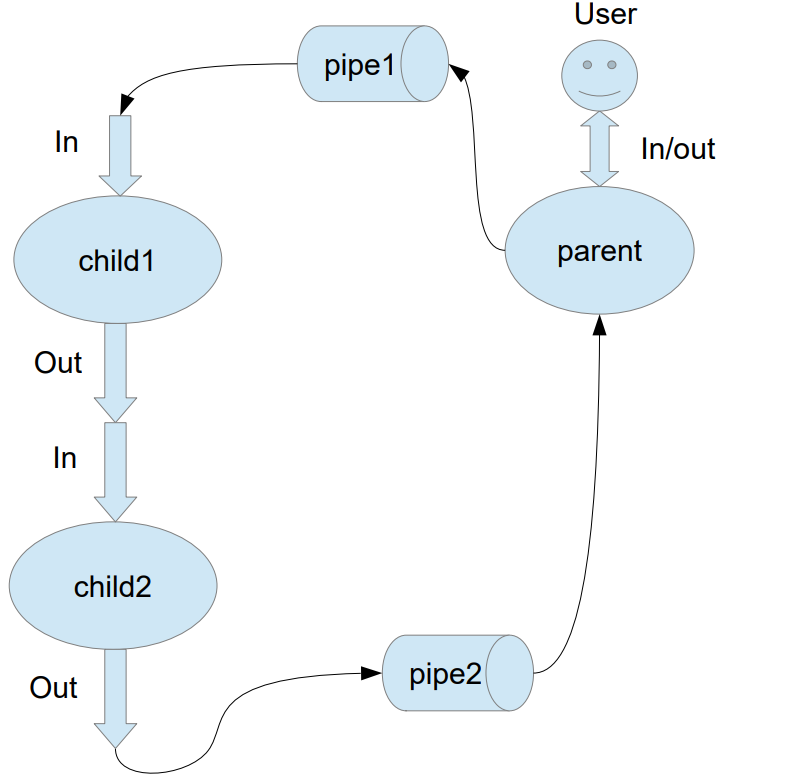
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**Постановка задачи**

**Вариант 11.**



Родительский процесс создает два дочерних процесса. Перенаправление стандартных потоков ввода-вывода показано на картинке выше. Child1 и Child2 можно «соединить» между собой дополнительным каналом. Родительский и дочерний процесс должны быть представлены разными программами. Родительский процесс принимает от пользователя строки произвольной длины и пересылает их в pipe1. Процесс child1 и child2 производят работу над строками. Child2 пересылает результат своей работы родительскому процессу. Родительский процесс полученный результат выводит в стандартный поток вывода.

Child1 переводит строки в верхний регистр. Child2 превращает все пробельные символы в символ «\_».

**Общий метод и алгоритм решения**

Использованные системные вызовы:

* pid\_t fork(void); – создаёт дочерний процесс.
* int pipe(int \*fd); – создаёт канал (пайп).
* int dup2(int oldfd, int newfd); – делает newfd копией дескриптора oldfd, закрывая newfd, если требуется.
* int execl(const char \*path, const char \*arg, ...); – заменяет текущий образ процесса новым образом процесса.
* int close(int fd); – закрывает файловый дескриптор.
* ssize\_t write(int fd, const void \*buf, size\_t count); – записывает до count байтов из буфера buf в файл, на который ссылается файловый описатель fd.
* ssize\_t read(int fd, void \*buf, size\_t count); – пытается записать count байтов файлового описателя fd в буфер, адрес которого начинается с buf.

Создал три пайпа для связи дочерних процессов и родительского с дочерними с помощью pipe(). Далее создал два дочерних процесса с помощью fork() и вызвал скомпилированные child1.cpp и child2.cpp с помощью execl(). В родительском процессе читал символы, которые пишет пользователь и посылал в child1. Первый дочерний процесс с помощью toupper() «озаглавливал» символы и посылал их child2. Второй дочерний процесс заменял пробел на «\_» и посылал обратно родительскому процессу, который в свою очередь выводил их на стандартный вывод.

**Код программы**

**main.cpp**

#include <unistd.h>

#include <iostream>

#include <string>

#include <cctype>

**int** create\_process() {

pid\_t pid = fork();

**if** (pid == -1) {

perror("Fork error!\n");

exit(-1);

}

**return** pid;

}

**void** create\_pipe(**int**\* pipe\_fd) {

**if** (pipe(pipe\_fd) == -1) {

perror("Pipe error!\n");

exit(-1);

}

}

**void** dup\_fd(**int** oldfd, **int** newfd) {

**if** (dup2(oldfd, newfd) == -1) {

perror("dup2 error!\n");

exit(-1);

}

}

**int** main() {

**int** pipe1\_fd[2], pipe2\_fd[2]; // pipe1 - from parent to child1, pipe2 - from child2 to parent

create\_pipe(pipe1\_fd);

create\_pipe(pipe2\_fd);

pid\_t child1 = create\_process();

**if** (child1 == 0) {

close(pipe1\_fd[1]);

close(pipe2\_fd[0]);

**int** pipech\_fd[2];

create\_pipe(pipech\_fd);

pid\_t child2 = create\_process();

**if** (child2 == 0) { // child2

close(pipech\_fd[0]);

close(pipe2\_fd[1]);

dup\_fd(pipe1\_fd[0], STDIN\_FILENO);

dup\_fd(pipech\_fd[1], STDOUT\_FILENO);

execl("../build/child2", "../build/child2", NULL);

close(pipech\_fd[1]);

close(pipe1\_fd[0]);

} **else** { // child1

close(pipe1\_fd[0]);

close(pipech\_fd[1]);

dup\_fd(pipech\_fd[0], STDIN\_FILENO);

dup\_fd(pipe2\_fd[1], STDOUT\_FILENO);

execl("../build/child1", "../build/child1", NULL);

close(pipe1\_fd[0]);

close(pipe2\_fd[1]);

}

} **else** { // parent

close(pipe1\_fd[0]);

close(pipe2\_fd[1]);

**char** c = getchar();

**while** (c != EOF) {

write(pipe1\_fd[1], &c, **sizeof**(c));

read(pipe2\_fd[0], &c, **sizeof**(c));

putchar(c);

c = getchar();

}

close(pipe1\_fd[1]);

close(pipe2\_fd[0]);

}

**return** 0;

}

**child1.cpp**

#include <iostream>

#include <unistd.h>

**int** main() {

**char** c;

**while** (read(STDIN\_FILENO, &c, **sizeof**(c)) != -1) {

c = toupper(c);

write(STDOUT\_FILENO, &c, **sizeof**(c));

}

close(STDIN\_FILENO);

close(STDOUT\_FILENO);

**return** 0;

}

**child2.cpp**

#include <iostream>

#include <unistd.h>

**int** main() {

**char** c;

**while** (read(STDIN\_FILENO, &c, **sizeof**(c)) != -1) {

**if** (c == ' ') {

c = '\_';

}

write(STDOUT\_FILENO, &c, **sizeof**(c));

}

close(STDIN\_FILENO);

close(STDOUT\_FILENO);

**return** 0;

}

**Протокол работы программы**

**Тестирование:**

cat\_mood@nuclear-box:~/programming/mai-os-labs/lab01/build$ ./main

> hello world!

HELLO\_WORLD!

> HaaH hAAh

HAAH\_HAAH\_\_\_\_\_\_

>

\_\_\_\_

> 123 #$$ {}":

123\_#$$\_{}":

**Strace:**

execve("./main", ["./main"], 0x7fff12da45e8 /\* 36 vars \*/) = 0

brk(NULL) = 0x55bb55177000

arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffcb0913060) = -1 EINVAL (Invalid argument)

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f3c39234000

access("/etc/ld.so.preload", R\_OK) = -1 ENOENT (No such file or directory)

openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC) = 3

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=18023, ...}, AT\_EMPTY\_PATH) = 0

mmap(NULL, 18023, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f3c3922f000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=2260296, ...}, AT\_EMPTY\_PATH) = 0

mmap(NULL, 2275520, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f3c39003000

mprotect(0x7f3c3909d000, 1576960, PROT\_NONE) = 0

mmap(0x7f3c3909d000, 1118208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x9a000) = 0x7f3c3909d000

mmap(0x7f3c391ae000, 454656, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1ab000) = 0x7f3c391ae000

mmap(0x7f3c3921e000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x21a000) = 0x7f3c3921e000

mmap(0x7f3c3922c000, 10432, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f3c3922c000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\237\2\0\0\0\0\0"..., 832) = 832

pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

pread64(3, "\4\0\0\0 \0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0"..., 48, 848) = 48

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 68, 896) = 68

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=2216304, ...}, AT\_EMPTY\_PATH) = 0

pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

mmap(NULL, 2260560, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f3c38ddb000

mmap(0x7f3c38e03000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x28000) = 0x7f3c38e03000

mmap(0x7f3c38f98000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1bd000) = 0x7f3c38f98000

mmap(0x7f3c38ff0000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x214000) = 0x7f3c38ff0000

mmap(0x7f3c38ff6000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f3c38ff6000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=940560, ...}, AT\_EMPTY\_PATH) = 0

mmap(NULL, 942344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f3c38cf4000

mmap(0x7f3c38d02000, 507904, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xe000) = 0x7f3c38d02000

mmap(0x7f3c38d7e000, 372736, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x8a000) = 0x7f3c38d7e000

mmap(0x7f3c38dd9000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xe4000) = 0x7f3c38dd9000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=125488, ...}, AT\_EMPTY\_PATH) = 0

mmap(NULL, 127720, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f3c38cd4000

mmap(0x7f3c38cd7000, 94208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f3c38cd7000

mmap(0x7f3c38cee000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1a000) = 0x7f3c38cee000

mmap(0x7f3c38cf2000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1d000) = 0x7f3c38cf2000

close(3) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f3c38cd2000

arch\_prctl(ARCH\_SET\_FS, 0x7f3c38cd33c0) = 0

set\_tid\_address(0x7f3c38cd3690) = 8798

set\_robust\_list(0x7f3c38cd36a0, 24) = 0

rseq(0x7f3c38cd3d60, 0x20, 0, 0x53053053) = 0

mprotect(0x7f3c38ff0000, 16384, PROT\_READ) = 0

mprotect(0x7f3c38cf2000, 4096, PROT\_READ) = 0

mprotect(0x7f3c38dd9000, 4096, PROT\_READ) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f3c38cd0000

mprotect(0x7f3c3921e000, 45056, PROT\_READ) = 0

mprotect(0x55bb538e1000, 4096, PROT\_READ) = 0

mprotect(0x7f3c3926e000, 8192, PROT\_READ) = 0

prlimit64(0, RLIMIT\_STACK, NULL, {rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

munmap(0x7f3c3922f000, 18023) = 0

getrandom("\xb2\x0a\x2c\xd3\xe9\x5c\x55\x3d", 8, GRND\_NONBLOCK) = 8

brk(NULL) = 0x55bb55177000

brk(0x55bb55198000) = 0x55bb55198000

futex(0x7f3c3922c77c, FUTEX\_WAKE\_PRIVATE, 2147483647) = 0

**pipe2([3, 4], 0) = 0**

**pipe2([5, 6], 0) = 0**

**clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLDstrace: Process 8799 attached**

**, child\_tidptr=0x7f3c38cd3690) = 8799**

[pid 8799] set\_robust\_list(0x7f3c38cd36a0, 24 <unfinished ...>

[pid 8798] close(3 <unfinished ...>

[pid 8799] <... set\_robust\_list resumed>) = 0

[pid 8798] <... close resumed>) = 0

[pid 8799] close(4 <unfinished ...>

[pid 8798] close(6 <unfinished ...>

[pid 8799] <... close resumed>) = 0

[pid 8798] <... close resumed>) = 0

[pid 8798] newfstatat(0, "", <unfinished ...>

[pid 8799] close(5 <unfinished ...>

[pid 8798] <... newfstatat resumed>{st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0x5), ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] <... close resumed>) = 0

[pid 8798] read(0, <unfinished ...>

**[pid 8799] pipe2([4, 5], 0) = 0**

**[pid 8799] clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLDstrace: Process 8800 attached**

<unfinished ...>

[pid 8800] set\_robust\_list(0x7f3c38cd36a0, 24) = 0

[pid 8799] <... clone resumed>, child\_tidptr=0x7f3c38cd3690) = 8800

**[pid 8800] close(4 <unfinished ...>**

**[pid 8799] close(3 <unfinished ...>**

[pid 8800] <... close resumed>) = 0

[pid 8799] <... close resumed>) = 0

**[pid 8800] close(6 <unfinished ...>**

**[pid 8799] close(5 <unfinished ...>**

[pid 8800] <... close resumed>) = 0

[pid 8799] <... close resumed>) = 0

**[pid 8800] dup2(3, 0) = 0**

**[pid 8799] dup2(4, 0 <unfinished ...>**

**[pid 8800] dup2(5, 1 <unfinished ...>**

[pid 8799] <... dup2 resumed>) = 0

[pid 8800] <... dup2 resumed>) = 1

**[pid 8800] execve("../build/child2", ["../build/child2"], 0x7ffcb0913238 /\* 36 vars \*/ <unfinished ...>**

**[pid 8799] dup2(6, 1) = 1**

**[pid 8799] execve("../build/child1", ["../build/child1"], 0x7ffcb0913238 /\* 36 vars \*/ <unfinished ...>**

[pid 8800] <... execve resumed>) = 0

[pid 8800] brk(NULL) = 0x55bb9b29d000

[pid 8799] <... execve resumed>) = 0

[pid 8800] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffce5d0b060 <unfinished ...>

[pid 8799] brk(NULL <unfinished ...>

[pid 8800] <... arch\_prctl resumed>) = -1 EINVAL (Invalid argument)

[pid 8799] <... brk resumed>) = 0x55eb27ff6000

[pid 8800] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8799] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffe7fa7c7f0 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc241e000

[pid 8799] <... arch\_prctl resumed>) = -1 EINVAL (Invalid argument)

[pid 8799] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8800] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc547467000

[pid 8800] <... access resumed>) = -1 ENOENT (No such file or directory)

[pid 8799] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 8800] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8799] <... access resumed>) = -1 ENOENT (No such file or directory)

[pid 8800] <... openat resumed>) = 4

[pid 8799] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8800] newfstatat(4, "", <unfinished ...>

[pid 8799] <... openat resumed>) = 3

[pid 8800] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=18023, ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] newfstatat(3, "", <unfinished ...>

[pid 8800] mmap(NULL, 18023, PROT\_READ, MAP\_PRIVATE, 4, 0 <unfinished ...>

[pid 8799] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=18023, ...}, AT\_EMPTY\_PATH) = 0

[pid 8800] <... mmap resumed>) = 0x7fedc2419000

[pid 8799] mmap(NULL, 18023, PROT\_READ, MAP\_PRIVATE, 3, 0 <unfinished ...>

[pid 8800] close(4 <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc547462000

[pid 8800] <... close resumed>) = 0

[pid 8799] close(3 <unfinished ...>

[pid 8800] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8799] <... close resumed>) = 0

[pid 8800] <... openat resumed>) = 4

[pid 8799] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8800] read(4, <unfinished ...>

[pid 8799] <... openat resumed>) = 3

[pid 8800] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8799] read(3, <unfinished ...>

[pid 8800] newfstatat(4, "", <unfinished ...>

[pid 8799] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8800] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2260296, ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] newfstatat(3, "", <unfinished ...>

[pid 8800] mmap(NULL, 2275520, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 4, 0 <unfinished ...>

[pid 8799] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2260296, ...}, AT\_EMPTY\_PATH) = 0

[pid 8800] <... mmap resumed>) = 0x7fedc21ed000

[pid 8799] mmap(NULL, 2275520, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 8800] mprotect(0x7fedc2287000, 1576960, PROT\_NONE <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc547236000

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] mprotect(0x7fc5472d0000, 1576960, PROT\_NONE <unfinished ...>

[pid 8800] mmap(0x7fedc2287000, 1118208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x9a000 <unfinished ...>

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] <... mmap resumed>) = 0x7fedc2287000

[pid 8799] mmap(0x7fc5472d0000, 1118208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x9a000 <unfinished ...>

[pid 8800] mmap(0x7fedc2398000, 454656, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x1ab000 <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc5472d0000

[pid 8800] <... mmap resumed>) = 0x7fedc2398000

[pid 8799] mmap(0x7fc5473e1000, 454656, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1ab000 <unfinished ...>

[pid 8800] mmap(0x7fedc2408000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x21a000 <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc5473e1000

[pid 8800] <... mmap resumed>) = 0x7fedc2408000

[pid 8799] mmap(0x7fc547451000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x21a000 <unfinished ...>

[pid 8800] mmap(0x7fedc2416000, 10432, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc547451000

[pid 8800] <... mmap resumed>) = 0x7fedc2416000

[pid 8799] mmap(0x7fc54745f000, 10432, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8800] close(4 <unfinished ...>

[pid 8799] <... mmap resumed>) = 0x7fc54745f000

[pid 8800] <... close resumed>) = 0

[pid 8799] close(3 <unfinished ...>

[pid 8800] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8799] <... close resumed>) = 0

[pid 8800] <... openat resumed>) = 4

[pid 8799] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8800] read(4, <unfinished ...>

[pid 8799] <... openat resumed>) = 3

[pid 8800] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\237\2\0\0\0\0\0"..., 832) = 832

[pid 8799] read(3, <unfinished ...>

[pid 8800] pread64(4, <unfinished ...>

[pid 8799] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\237\2\0\0\0\0\0"..., 832) = 832

[pid 8800] <... pread64 resumed>"\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

[pid 8799] pread64(3, <unfinished ...>

[pid 8800] pread64(4, "\4\0\0\0 \0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0"..., 48, 848) = 48

[pid 8799] <... pread64 resumed>"\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

[pid 8800] pread64(4, <unfinished ...>

[pid 8799] pread64(3, <unfinished ...>

[pid 8800] <... pread64 resumed>"\4\0\0\0\24\0\0\0\3\0\0\0GNU\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 68, 896) = 68

[pid 8799] <... pread64 resumed>"\4\0\0\0 \0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0"..., 48, 848) = 48

[pid 8800] newfstatat(4, "", <unfinished ...>

[pid 8799] pread64(3, <unfinished ...>

[pid 8800] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2216304, ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] <... pread64 resumed>"\4\0\0\0\24\0\0\0\3\0\0\0GNU\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 68, 896) = 68

[pid 8800] pread64(4, <unfinished ...>

[pid 8799] newfstatat(3, "", <unfinished ...>

[pid 8800] <... pread64 resumed>"\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

[pid 8799] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2216304, ...}, AT\_EMPTY\_PATH) = 0

[pid 8800] mmap(NULL, 2260560, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 4, 0 <unfinished ...>

[pid 8799] pread64(3, <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1fc5000

[pid 8799] <... pread64 resumed>"\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784

[pid 8800] mmap(0x7fedc1fed000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x28000 <unfinished ...>

[pid 8799] mmap(NULL, 2260560, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1fed000

[pid 8799] <... mmap resumed>) = 0x7fc54700e000

[pid 8800] mmap(0x7fedc2182000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x1bd000 <unfinished ...>

[pid 8799] mmap(0x7fc547036000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x28000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc2182000

[pid 8799] <... mmap resumed>) = 0x7fc547036000

[pid 8800] mmap(0x7fedc21da000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x214000 <unfinished ...>

[pid 8799] mmap(0x7fc5471cb000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1bd000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc21da000

[pid 8799] <... mmap resumed>) = 0x7fc5471cb000

[pid 8800] mmap(0x7fedc21e0000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8799] mmap(0x7fc547223000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x214000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc21e0000

[pid 8799] <... mmap resumed>) = 0x7fc547223000

[pid 8800] close(4 <unfinished ...>

[pid 8799] mmap(0x7fc547229000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8800] <... close resumed>) = 0

[pid 8799] <... mmap resumed>) = 0x7fc547229000

[pid 8800] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8799] close(3 <unfinished ...>

[pid 8800] <... openat resumed>) = 4

[pid 8799] <... close resumed>) = 0

[pid 8800] read(4, <unfinished ...>

[pid 8799] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8800] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8799] <... openat resumed>) = 3

[pid 8800] newfstatat(4, "", <unfinished ...>

[pid 8799] read(3, <unfinished ...>

[pid 8800] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=940560, ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8800] mmap(NULL, 942344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 4, 0 <unfinished ...>

[pid 8799] newfstatat(3, "", <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1ede000

[pid 8799] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=940560, ...}, AT\_EMPTY\_PATH) = 0

[pid 8800] mmap(0x7fedc1eec000, 507904, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0xe000 <unfinished ...>

[pid 8799] mmap(NULL, 942344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1eec000

[pid 8799] <... mmap resumed>) = 0x7fc546f27000

[pid 8800] mmap(0x7fedc1f68000, 372736, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x8a000 <unfinished ...>

[pid 8799] mmap(0x7fc546f35000, 507904, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xe000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1f68000

[pid 8799] <... mmap resumed>) = 0x7fc546f35000

[pid 8800] mmap(0x7fedc1fc3000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0xe4000 <unfinished ...>

[pid 8799] mmap(0x7fc546fb1000, 372736, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x8a000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1fc3000

[pid 8799] <... mmap resumed>) = 0x7fc546fb1000

[pid 8800] close(4 <unfinished ...>

[pid 8799] mmap(0x7fc54700c000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xe4000 <unfinished ...>

[pid 8800] <... close resumed>) = 0

[pid 8799] <... mmap resumed>) = 0x7fc54700c000

[pid 8800] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8799] close(3 <unfinished ...>

[pid 8800] <... openat resumed>) = 4

[pid 8799] <... close resumed>) = 0

[pid 8800] read(4, <unfinished ...>

[pid 8799] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 8800] <... read resumed>"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8799] <... openat resumed>) = 3

[pid 8800] newfstatat(4, "", <unfinished ...>

[pid 8799] read(3, <unfinished ...>

[pid 8800] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=125488, ...}, AT\_EMPTY\_PATH) = 0

[pid 8799] <... read resumed>"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832

[pid 8800] mmap(NULL, 127720, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 4, 0 <unfinished ...>

[pid 8799] newfstatat(3, "", <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1ebe000

[pid 8799] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=125488, ...}, AT\_EMPTY\_PATH) = 0

[pid 8800] mmap(0x7fedc1ec1000, 94208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x3000 <unfinished ...>

[pid 8799] mmap(NULL, 127720, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1ec1000

[pid 8799] <... mmap resumed>) = 0x7fc546f07000

[pid 8800] mmap(0x7fedc1ed8000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x1a000 <unfinished ...>

[pid 8799] mmap(0x7fc546f0a000, 94208, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1ed8000

[pid 8799] <... mmap resumed>) = 0x7fc546f0a000

[pid 8800] mmap(0x7fedc1edc000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 4, 0x1d000 <unfinished ...>

[pid 8799] mmap(0x7fc546f21000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1a000 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1edc000

[pid 8799] <... mmap resumed>) = 0x7fc546f21000

[pid 8800] close(4 <unfinished ...>

[pid 8799] mmap(0x7fc546f25000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1d000 <unfinished ...>

[pid 8800] <... close resumed>) = 0

[pid 8799] <... mmap resumed>) = 0x7fc546f25000

[pid 8800] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8799] close(3 <unfinished ...>

[pid 8800] <... mmap resumed>) = 0x7fedc1ebc000

[pid 8799] <... close resumed>) = 0

[pid 8800] arch\_prctl(ARCH\_SET\_FS, 0x7fedc1ebd3c0 <unfinished ...>

[pid 8799] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8800] <... arch\_prctl resumed>) = 0

[pid 8799] <... mmap resumed>) = 0x7fc546f05000

[pid 8800] set\_tid\_address(0x7fedc1ebd690 <unfinished ...>

[pid 8799] arch\_prctl(ARCH\_SET\_FS, 0x7fc546f063c0 <unfinished ...>

[pid 8800] <... set\_tid\_address resumed>) = 8800

[pid 8799] <... arch\_prctl resumed>) = 0

[pid 8800] set\_robust\_list(0x7fedc1ebd6a0, 24 <unfinished ...>

[pid 8799] set\_tid\_address(0x7fc546f06690 <unfinished ...>

[pid 8800] <... set\_robust\_list resumed>) = 0

[pid 8799] <... set\_tid\_address resumed>) = 8799

[pid 8800] rseq(0x7fedc1ebdd60, 0x20, 0, 0x53053053 <unfinished ...>

[pid 8799] set\_robust\_list(0x7fc546f066a0, 24 <unfinished ...>

[pid 8800] <... rseq resumed>) = 0

[pid 8799] <... set\_robust\_list resumed>) = 0

[pid 8800] mprotect(0x7fedc21da000, 16384, PROT\_READ <unfinished ...>

[pid 8799] rseq(0x7fc546f06d60, 0x20, 0, 0x53053053 <unfinished ...>

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] <... rseq resumed>) = 0

[pid 8800] mprotect(0x7fedc1edc000, 4096, PROT\_READ <unfinished ...>

[pid 8799] mprotect(0x7fc547223000, 16384, PROT\_READ <unfinished ...>

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] mprotect(0x7fedc1fc3000, 4096, PROT\_READ <unfinished ...>

[pid 8799] mprotect(0x7fc546f25000, 4096, PROT\_READ <unfinished ...>

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] <... mprotect resumed>) = 0

[pid 8799] mprotect(0x7fc54700c000, 4096, PROT\_READ <unfinished ...>

[pid 8800] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] <... mmap resumed>) = 0x7fedc1eba000

[pid 8799] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7fc546f03000

[pid 8800] mprotect(0x7fedc2408000, 45056, PROT\_READ) = 0

[pid 8799] mprotect(0x7fc547451000, 45056, PROT\_READ <unfinished ...>

[pid 8800] mprotect(0x55bb993f8000, 4096, PROT\_READ <unfinished ...>

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] mprotect(0x55eb2640c000, 4096, PROT\_READ <unfinished ...>

[pid 8800] mprotect(0x7fedc2458000, 8192, PROT\_READ <unfinished ...>

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] <... mprotect resumed>) = 0

[pid 8799] mprotect(0x7fc5474a1000, 8192, PROT\_READ <unfinished ...>

[pid 8800] prlimit64(0, RLIMIT\_STACK, NULL, <unfinished ...>

[pid 8799] <... mprotect resumed>) = 0

[pid 8800] <... prlimit64 resumed>{rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

[pid 8799] prlimit64(0, RLIMIT\_STACK, NULL, <unfinished ...>

[pid 8800] munmap(0x7fedc2419000, 18023 <unfinished ...>

[pid 8799] <... prlimit64 resumed>{rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

[pid 8800] <... munmap resumed>) = 0

[pid 8799] munmap(0x7fc547462000, 18023 <unfinished ...>

[pid 8800] getrandom( <unfinished ...>

[pid 8799] <... munmap resumed>) = 0

[pid 8800] <... getrandom resumed>"\x37\x87\x0c\xa7\x1e\xb0\x4b\x66", 8, GRND\_NONBLOCK) = 8

[pid 8799] getrandom( <unfinished ...>

[pid 8800] brk(NULL <unfinished ...>

[pid 8799] <... getrandom resumed>"\x15\xfa\xec\x38\x5a\xf7\x2a\xd0", 8, GRND\_NONBLOCK) = 8

[pid 8800] <... brk resumed>) = 0x55bb9b29d000

[pid 8799] brk(NULL <unfinished ...>

[pid 8800] brk(0x55bb9b2be000 <unfinished ...>

[pid 8799] <... brk resumed>) = 0x55eb27ff6000

[pid 8800] <... brk resumed>) = 0x55bb9b2be000

[pid 8799] brk(0x55eb28017000 <unfinished ...>

[pid 8800] futex(0x7fedc241677c, FUTEX\_WAKE\_PRIVATE, 2147483647 <unfinished ...>

[pid 8799] <... brk resumed>) = 0x55eb28017000

[pid 8800] <... futex resumed>) = 0

[pid 8799] futex(0x7fc54745f77c, FUTEX\_WAKE\_PRIVATE, 2147483647 <unfinished ...>

[pid 8800] read(0, <unfinished ...>

[pid 8799] <... futex resumed>) = 0

[pid 8799] read(0, hello

<unfinished ...>

[pid 8798] <... read resumed>"hello\n", 1024) = 6

[pid 8798] write(4, "h", 1) = 1

[pid 8800] <... read resumed>"h", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "h", 1) = 1

[pid 8799] <... read resumed>"h", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "H", 1) = 1

[pid 8798] <... read resumed>"H", 1) = 1

[pid 8799] read(0, <unfinished ...>

[pid 8798] newfstatat(1, "", {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0x5), ...}, AT\_EMPTY\_PATH) = 0

[pid 8798] write(4, "e", 1) = 1

[pid 8800] <... read resumed>"e", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "e", 1) = 1

[pid 8799] <... read resumed>"e", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "E", 1 <unfinished ...>

[pid 8798] <... read resumed>"E", 1) = 1

[pid 8799] <... write resumed>) = 1

[pid 8798] write(4, "l", 1 <unfinished ...>

[pid 8799] read(0, <unfinished ...>

[pid 8798] <... write resumed>) = 1

[pid 8800] <... read resumed>"l", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "l", 1) = 1

[pid 8799] <... read resumed>"l", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "L", 1 <unfinished ...>

[pid 8798] <... read resumed>"L", 1) = 1

[pid 8799] <... write resumed>) = 1

[pid 8798] write(4, "l", 1 <unfinished ...>

[pid 8799] read(0, <unfinished ...>

[pid 8798] <... write resumed>) = 1

[pid 8800] <... read resumed>"l", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "l", 1) = 1

[pid 8799] <... read resumed>"l", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "L", 1 <unfinished ...>

[pid 8798] <... read resumed>"L", 1) = 1

[pid 8799] <... write resumed>) = 1

[pid 8798] write(4, "o", 1 <unfinished ...>

[pid 8799] read(0, <unfinished ...>

[pid 8798] <... write resumed>) = 1

[pid 8800] <... read resumed>"o", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "o", 1) = 1

[pid 8799] <... read resumed>"o", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "O", 1 <unfinished ...>

[pid 8798] <... read resumed>"O", 1) = 1

[pid 8799] <... write resumed>) = 1

[pid 8798] write(4, "\n", 1 <unfinished ...>

[pid 8799] read(0, <unfinished ...>

[pid 8798] <... write resumed>) = 1

[pid 8800] <... read resumed>"\n", 1) = 1

[pid 8798] read(5, <unfinished ...>

[pid 8800] write(1, "\n", 1) = 1

[pid 8799] <... read resumed>"\n", 1) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] write(1, "\n", 1 <unfinished ...>

[pid 8798] <... read resumed>"\n", 1) = 1

[pid 8799] <... write resumed>) = 1

[pid 8798] write(1, "HELLO\n", 6 <unfinished ...>

HELLO

[pid 8799] read(0, <unfinished ...>

[pid 8798] <... write resumed>) = 6

[pid 8798] read(0, "", 1024) = 0

[pid 8798] close(4) = 0

[pid 8800] <... read resumed>"", 1) = 0

[pid 8798] close(5 <unfinished ...>

[pid 8800] write(1, "\n", 1 <unfinished ...>

[pid 8798] <... close resumed>) = 0

[pid 8800] <... write resumed>) = 1

[pid 8800] read(0, <unfinished ...>

[pid 8799] <... read resumed>"\n", 1) = 1

[pid 8798] exit\_group(0 <unfinished ...>

[pid 8800] <... read resumed>"", 1) = 0

[pid 8798] <... exit\_group resumed>) = ?

[pid 8799] write(1, "\n", 1 <unfinished ...>

[pid 8800] write(1, "\n", 1 <unfinished ...>

[pid 8799] <... write resumed>) = -1 EPIPE (Broken pipe)

[pid 8798] +++ exited with 0 +++

[pid 8800] <... write resumed>) = 1

[pid 8799] --- SIGPIPE {si\_signo=SIGPIPE, si\_code=SI\_USER, si\_pid=8799, si\_uid=1000} ---

[pid 8800] read(0, "", 1) = 0

[pid 8800] write(1, "\n", 1) = 1

[pid 8799] +++ killed by SIGPIPE +++

read(0, "", 1) = 0

write(1, "\n", 1) = -1 EPIPE (Broken pipe)

--- SIGPIPE {si\_signo=SIGPIPE, si\_code=SI\_USER, si\_pid=8800, si\_uid=1000} ---

+++ killed by SIGPIPE +++

**Вывод**

В ходе лабораторной работы я написал программу, которая делает системные вызовы. Я научился использовать пайпы и работать с процессами. В ходе работы я столкнулся с некоторыми проблемами: бесконечный цикл (решил заменой cin/cout на read/write) и segmentation fault (решил использованием char вместо std::string).