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»**

Группа: М80-206Б-22

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Оценка: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

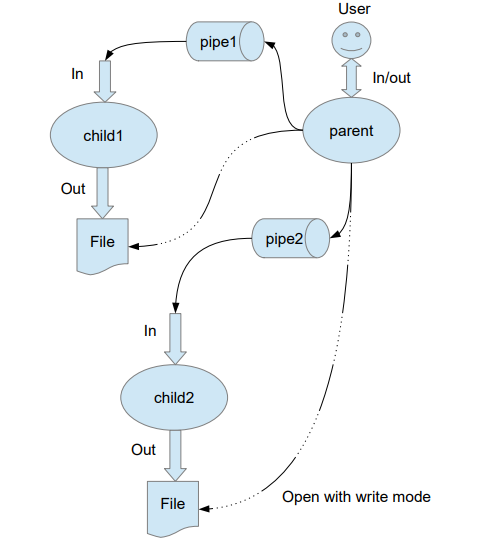
Дата: 20.10.23

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**Постановка задачи**

Вариант 17.

Цель работы: приобрести практические навыки в управлении процессами в ОС и обеспечении обмена данных между процессами посредством каналов.



Общее задание: составить и отладить программу на языке C++, осуществляющую работу с процессами и взаимодействие между ними в одной из двух операционных систем. В результате работы будут созданы два дочерних процесса Child1 и Child2.

Комментарии по заданию к 17 варианту: родительский процесс создает два дочерних. Первой строкой пользователь в консоль вводит имя файла, которое будет использовано для открытия файла с таким именем на запись для Child1, аналогично для Child2. Родительский процесс принимает от пользователя строки произвольной длины и пересылает их в pipe1 или pipe2 (строки длины больше 10 символов отправляются в pipe2, иначе в pipe1). Дочерние процессы удаляют все гласные из строк.

**Общий метод и алгоритм решения**

**Системные вызовы:**

*pid\_t* child1 = fork();

// создание дочернего процесса

*int* pipe1[2], pipe2[2];

// создание каналов

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

// выполнение child1 вместо текущей программы

dup2(pipe1[0], STDIN\_FILENO);

// замена значения стандартного ввода на значение pipe1[0]

close(pipe1[0]);

// закрытие доступа к файловому дескриптору

*int* f\_Fd1 = open(filename1.c\_str(), O\_CREAT | O\_WRONLY | O\_TRUNC , 0777);

// открываем файл на запись

read(STDIN\_FILENO, inputLine2, inputLineLen2);

// чтение из стандартного ввода

write(STDOUT\_FILENO, output2.c\_str(), output2.length());

// пишем в стандартный вывод

В коде будут представлены комментарии, поясняющие работу программы. В данной лабораторной работе для связи между процессами использовались каналы pipe1 (для Child1) и pipe2 (для Child2). Дочерние процессы реализованы отдельными программами и для них переопределены стандартный ввод и вывод.

**Код программы**

**main.c**

#include <iostream>

#include <unistd.h> //fork, exec, pipe, read, write

#include <fcntl.h> //работа с файловыми дескрипторами

#include <sys/types.h>

#include <cstring>

using *namespace* std;

*int* main(){

    string filename1, filename2;

    cout << "Введите имя файла для Child1: \n";

    cin >> filename1;

    cin.ignore();

    cout << "Введите имя файла для Child2: \n";

    cin >> filename2;

    cin.ignore();

    //откроем файлы для записи

*int* f\_Fd1 = open(filename1.c\_str(), O\_CREAT | O\_WRONLY | O\_TRUNC , 0777); //0777 - все права, но открываем только для записи

    //c\_str() - преобразование в char из string

*int* f\_Fd2 = open(filename2.c\_str(), O\_CREAT | O\_WRONLY | O\_TRUNC , 0777);

    if (f\_Fd1 == -1){

        cerr << "can't open file: " << filename1;

        exit(EXIT\_FAILURE);

    }

    if (f\_Fd2 == -1){

        cerr << "can't open file: " << filename2;

        exit(EXIT\_FAILURE);

    }

*int* pipe1[2], pipe2[2];

    if (pipe(pipe1) == -1 || pipe(pipe2) == -1){

        cerr << "fail pipe()";

        exit(EXIT\_FAILURE);

    } //проверили на правильное создание

    // создаем Child1 процесс

*pid\_t* child1 = fork();

    if (child1 == -1)

    {

        perror("fork");

        exit(EXIT\_FAILURE);

    } //проверка на создание процесса (вилка)

    if (child1 == 0){ //работаем в child1 - дочерний процесс 1

        close(pipe1[1]); //закрыли pipe1 на запись

        dup2(pipe1[0], STDIN\_FILENO); //читаем в IN из pipe1

        dup2(f\_Fd1, STDOUT\_FILENO); //записываем результат работы в f\_Fd1 (OUT)

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

        //если не смогли запустить child1

        close(pipe1[0]);

        close(f\_Fd1);

        cout << "can't exec child1 process";

        exit(-1);

    } else { //находимся в родительском процессе

        //поработаем над созданием еще одного процесса

        //создаем Child2 процесс

*pid\_t* child2 = fork();

        if (child2 == -1)

        {

            perror("fork");

            exit(EXIT\_FAILURE);

        } //проверка на создание процесса

        if (child2 == 0){ //находимся в child2 процессе

            close(pipe2[1]); //закрыли pipe1 на запись

            dup2(pipe2[0], STDIN\_FILENO); //читаем в IN из pipe2

            dup2(f\_Fd2, STDOUT\_FILENO); //записываем результат работы в f\_Fd2 (OUT)

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

            //если не смогли запустить child2

            close(pipe2[0]);

            close(f\_Fd2);

            cout << "can't exec child2 process";

            exit(-1);

        } else { //в родительском процессе

            close(pipe1[0]);

            close(pipe2[0]);

            string inputLine;

*int* inputLineLen = 0;

            while (getline(cin, inputLine)){

                inputLineLen = inputLine.length();

                if (inputLineLen > 10){

                    write(pipe2[1], &inputLineLen, sizeof(inputLineLen));

                    write(pipe2[1], inputLine.c\_str(), inputLine.length());

                } else {

                    write(pipe1[1], &inputLineLen, sizeof(inputLineLen));

                    write(pipe1[1], inputLine.c\_str(), inputLine.length());

                } }

            close(pipe1[1]);

            close(pipe2[1]);

        }

    }

    return 0;

}

**child1.cpp**

#include <unistd.h>

#include <string>

#include <iostream>

using *namespace* std;

*int* main(){

*int* inputLineLen1;

    while(1){

        read(STDIN\_FILENO, &inputLineLen1, sizeof(inputLineLen1));

*char* inputLine1[inputLineLen1];

        read(STDIN\_FILENO, inputLine1, inputLineLen1);

        string output1;

        for (*int* i = 0; i < inputLineLen1; i++){

*char* c1 = inputLine1[i];

            if (c1 != 'a' && c1 != 'e' && c1 != 'i' && c1 != 'o' && c1 != 'u' && c1 != 'y'){

                output1 += c1;

            }

        }

        output1 += '\n';

        write(STDOUT\_FILENO, output1.c\_str(), output1.length());

        //в файл просто пишем строку

    }

    return 0;

}

**Child2.cpp**

#include <unistd.h>

#include <string>

#include <iostream>

using *namespace* std;

*int* main(){

*int* inputLineLen2;

    while(1){

        read(STDIN\_FILENO, &inputLineLen2, sizeof(inputLineLen2));

*char* inputLine2[inputLineLen2];

        read(STDIN\_FILENO, inputLine2, inputLineLen2);

        string output2;

        for (*int* j = 0; j < inputLineLen2; j++){

*char* c2 = inputLine2[j];

            if (c2 != 'a' && c2 != 'e' && c2 != 'i' && c2 != 'o' && c2 != 'u' && c2 != 'y'){

                output2 += c2;

            }

        }

        output2 += '\n';

        write(STDOUT\_FILENO, output2.c\_str(), output2.length());

        //в файл просто пишем строку

    }

    return 0;

}

**CMakeLists.txt**

cmake\_minimum\_required(VERSION 3.8)

#требования к версии

project(fLROS)

#имя проекта

set(CMAKE\_CXX\_STANDART 17) #стандарт языка си++

set(CMAKE\_CXX\_STANDART\_REQUIRED ON) #без соответствия стандарту не будет собран

add\_executable(main1 main.cpp)

add\_executable(child1 Child1.cpp)

add\_executable(child2 Child2.cpp)

**Протокол работы программы**

**Тестирование:**

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cmake ..

-- Configuring done

-- Generating done

-- Build files have been written to: /home/kateland/OSLabs/FirstOSLab/build1

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cmake --build .

Scanning dependencies of target child2

[ 16%] Building CXX object CMakeFiles/child2.dir/Child2.cpp.o

[ 33%] Linking CXX executable child2

[ 33%] Built target child2

Scanning dependencies of target child1

[ 50%] Building CXX object CMakeFiles/child1.dir/Child1.cpp.o

[ 66%] Linking CXX executable child1

[ 66%] Built target child1

Scanning dependencies of target main1

[ 83%] Building CXX object CMakeFiles/main1.dir/main.cpp.o

[100%] Linking CXX executable main1

[100%] Built target main1

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ ls

CMakeCache.txt CMakeFiles Makefile child1 child2 cmake\_install.cmake main1

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ ./main1

Введите имя файла для Child1:

f1

Введите имя файла для Child2:

f2

wsggruyutr

grthwuh

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ ls

CMakeCache.txt CMakeFiles Makefile child1 child2 cmake\_install.cmake f1 f2 main1

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cat f1

wsggrtr

grthwh

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cat f2

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ ./main1

Введите имя файла для Child1:

f1

Введите имя файла для Child2:

f2

rereryytryyyyyyyyui

regru

uui

rtrgeeeeeeeeeeeuom

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cat f1

rgr

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ cat f2

rrrtr

rtrgm

**Strace**

kateland@DESKTOP-0GN4T39:~/OSLabs/FirstOSLab/build1$ strace -f ./main1

execve("./main1", ["./main1"], 0x7ffec5aaf2a8 /\* 21 vars \*/) = 0

brk(NULL) = 0x5616c7f8f000

arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffda16d5690) = -1 EINVAL (Invalid argument)

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

fstat(3, {st\_mode=S\_IFREG|0644, st\_size=55828, ...}) = 0

mmap(NULL, 55828, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7feefae32000

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`\341\t\0\0\0\0\0"..., 832) = 832

fstat(3, {st\_mode=S\_IFREG|0644, st\_size=1956992, ...}) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7feefae30000

mmap(NULL, 1972224, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7feefac4e000

mprotect(0x7feeface4000, 1290240, PROT\_NONE) = 0

mmap(0x7feeface4000, 987136, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x96000) = 0x7feeface4000

mmap(0x7feefadd5000, 299008, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x187000) = 0x7feefadd5000

mmap(0x7feefae1f000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1d0000) = 0x7feefae1f000

mmap(0x7feefae2d000, 10240, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7feefae2d000

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\3405\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st\_mode=S\_IFREG|0644, st\_size=104984, ...}) = 0

mmap(NULL, 107592, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7feefac33000

mmap(0x7feefac36000, 73728, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7feefac36000

mmap(0x7feefac48000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x15000) = 0x7feefac48000

mmap(0x7feefac4c000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x18000) = 0x7feefac4c000

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\0\300A\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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

fstat(3, {st\_mode=S\_IFREG|0755, st\_size=2029592, ...}) = 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

pread64(3, "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

mmap(NULL, 2037344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7feefaa41000

mmap(0x7feefaa63000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x22000) = 0x7feefaa63000

mmap(0x7feefabdb000, 319488, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x19a000) = 0x7feefabdb000

mmap(0x7feefac29000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1e7000) = 0x7feefac29000

mmap(0x7feefac2f000, 13920, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7feefac2f000

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\300\323\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st\_mode=S\_IFREG|0644, st\_size=1369384, ...}) = 0

mmap(NULL, 1368336, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7feefa8f2000

mmap(0x7feefa8ff000, 684032, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xd000) = 0x7feefa8ff000

mmap(0x7feefa9a6000, 626688, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xb4000) = 0x7feefa9a6000

mmap(0x7feefaa3f000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x14c000) = 0x7feefaa3f000

close(3) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7feefa8f0000

arch\_prctl(ARCH\_SET\_FS, 0x7feefa8f1100) = 0

mprotect(0x7feefac29000, 16384, PROT\_READ) = 0

mprotect(0x7feefaa3f000, 4096, PROT\_READ) = 0

mprotect(0x7feefac4c000, 4096, PROT\_READ) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7feefa8ee000

mprotect(0x7feefae1f000, 45056, PROT\_READ) = 0

mprotect(0x5616c7005000, 4096, PROT\_READ) = 0

mprotect(0x7feefae6d000, 4096, PROT\_READ) = 0

munmap(0x7feefae32000, 55828) = 0

brk(NULL) = 0x5616c7f8f000

brk(0x5616c7fb0000) = 0x5616c7fb0000

fstat(1, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0x3), ...}) = 0

write(1, "\320\222\320\262\320\265\320\264\320\270\321\202\320\265 \320\270\320\274\321\217 \321\204\320\260\320\271\320\273\320\260"..., 49Введите имя файла для Child1:

) = 49

fstat(0, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0x3), ...}) = 0

read(0, f1

"f1\n", 1024) = 3

write(1, "\320\222\320\262\320\265\320\264\320\270\321\202\320\265 \320\270\320\274\321\217 \321\204\320\260\320\271\320\273\320\260"..., 49Введите имя файла для Child2:

) = 49

read(0, f2

"f2\n", 1024) = 3

openat(AT\_FDCWD, "f1", O\_WRONLY|O\_CREAT|O\_TRUNC, 0777) = 3

openat(AT\_FDCWD, "f2", O\_WRONLY|O\_CREAT|O\_TRUNC, 0777) = 4

pipe([5, 6]) = 0

pipe([7, 8]) = 0

clone(strace: Process 1237 attached

child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7feefa8f13d0) = 1237

[pid 1236] clone( <unfinished ...>

[pid 1237] close(6) = 0

strace: Process 1238 attached

[pid 1236] <... clone resumed> child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7feefa8f13d0) = 1238

[pid 1238] close(8 <unfinished ...>

[pid 1236] close(5 <unfinished ...>

[pid 1238] <... close resumed> ) = 0

[pid 1236] <... close resumed> ) = 0

[pid 1238] dup2(7, 0 <unfinished ...>

[pid 1236] close(7 <unfinished ...>

[pid 1238] <... dup2 resumed> ) = 0

[pid 1236] <... close resumed> ) = 0

[pid 1237] dup2(5, 0 <unfinished ...>

[pid 1236] read(0, <unfinished ...>

[pid 1238] dup2(4, 1 <unfinished ...>

[pid 1237] <... dup2 resumed> ) = 0

[pid 1238] <... dup2 resumed> ) = 1

[pid 1237] dup2(3, 1 <unfinished ...>

[pid 1238] execve("./child2", ["./child2"], 0x7ffda16d5778 /\* 21 vars \*/ <unfinished ...>

[pid 1237] <... dup2 resumed> ) = 1

[pid 1237] execve("./child1", ["./child1"], 0x7ffda16d5778 /\* 21 vars \*/ <unfinished ...>

[pid 1238] <... execve resumed> ) = 0

[pid 1238] brk(NULL) = 0x55f503ef8000

[pid 1237] <... execve resumed> ) = 0

[pid 1238] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffbb479480 <unfinished ...>

[pid 1237] brk(NULL <unfinished ...>

[pid 1238] <... arch\_prctl resumed> ) = -1 EINVAL (Invalid argument)

[pid 1237] <... brk resumed> ) = 0x5565549f3000

[pid 1238] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 1237] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fff9d8ddb50 <unfinished ...>

[pid 1238] <... access resumed> ) = -1 ENOENT (No such file or directory)

[pid 1237] <... arch\_prctl resumed> ) = -1 EINVAL (Invalid argument)

[pid 1238] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1237] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 1238] <... openat resumed> ) = 8

[pid 1237] <... access resumed> ) = -1 ENOENT (No such file or directory)

[pid 1238] fstat(8, <unfinished ...>

[pid 1237] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1238] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=55828, ...}) = 0

[pid 1237] <... openat resumed> ) = 6

[pid 1238] mmap(NULL, 55828, PROT\_READ, MAP\_PRIVATE, 8, 0 <unfinished ...>

[pid 1237] fstat(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f405000

[pid 1237] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=55828, ...}) = 0

[pid 1238] close(8 <unfinished ...>

[pid 1237] mmap(NULL, 55828, PROT\_READ, MAP\_PRIVATE, 6, 0 <unfinished ...>

[pid 1238] <... close resumed> ) = 0

[pid 1237] <... mmap resumed> ) = 0x7fbe8ddd7000

[pid 1238] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1237] close(6 <unfinished ...>

[pid 1238] <... openat resumed> ) = 8

[pid 1237] <... close resumed> ) = 0

[pid 1238] read(8, <unfinished ...>

[pid 1237] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1238] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0`\341\t\0\0\0\0\0"..., 832) = 832

[pid 1237] <... openat resumed> ) = 6

[pid 1238] fstat(8, <unfinished ...>

[pid 1237] read(6, <unfinished ...>

[pid 1238] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=1956992, ...}) = 0

[pid 1237] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0`\341\t\0\0\0\0\0"..., 832) = 832

[pid 1238] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1237] fstat(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f403000

[pid 1237] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=1956992, ...}) = 0

[pid 1238] mmap(NULL, 1972224, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 8, 0 <unfinished ...>

[pid 1237] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f221000

[pid 1237] <... mmap resumed> ) = 0x7fbe8ddd5000

[pid 1238] mprotect(0x7fa97f2b7000, 1290240, PROT\_NONE) = 0

[pid 1237] mmap(NULL, 1972224, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 6, 0 <unfinished ...>

[pid 1238] mmap(0x7fa97f2b7000, 987136, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x96000 <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbf3000

[pid 1238] <... mmap resumed> ) = 0x7fa97f2b7000

[pid 1237] mprotect(0x7fbe8dc89000, 1290240, PROT\_NONE <unfinished ...>

[pid 1238] mmap(0x7fa97f3a8000, 299008, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x187000 <unfinished ...>

[pid 1237] <... mprotect resumed> ) = 0

[pid 1238] <... mmap resumed> ) = 0x7fa97f3a8000

[pid 1237] mmap(0x7fbe8dc89000, 987136, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x96000 <unfinished ...>

[pid 1238] mmap(0x7fa97f3f2000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x1d0000) = 0x7fa97f3f2000

[pid 1237] <... mmap resumed> ) = 0x7fbe8dc89000

[pid 1238] mmap(0x7fa97f400000, 10240, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7fa97f400000

[pid 1237] mmap(0x7fbe8dd7a000, 299008, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x187000 <unfinished ...>

[pid 1238] close(8 <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8dd7a000

[pid 1238] <... close resumed> ) = 0

[pid 1237] mmap(0x7fbe8ddc4000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x1d0000 <unfinished ...>

[pid 1238] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8ddc4000

[pid 1238] <... openat resumed> ) = 8

[pid 1237] mmap(0x7fbe8ddd2000, 10240, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1238] read(8, <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8ddd2000

[pid 1238] <... read resumed> "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\3405\0\0\0\0\0\0"..., 832) = 832

[pid 1238] fstat(8, {st\_mode=S\_IFREG|0644, st\_size=104984, ...}) = 0

[pid 1238] mmap(NULL, 107592, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 8, 0) = 0x7fa97f206000

[pid 1237] close(6 <unfinished ...>

[pid 1238] mmap(0x7fa97f209000, 73728, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x3000 <unfinished ...>

[pid 1237] <... close resumed> ) = 0

[pid 1238] <... mmap resumed> ) = 0x7fa97f209000

[pid 1238] mmap(0x7fa97f21b000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x15000 <unfinished ...>

[pid 1237] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f21b000

[pid 1237] <... openat resumed> ) = 6

[pid 1238] mmap(0x7fa97f21f000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x18000 <unfinished ...>

[pid 1237] read(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f21f000

[pid 1237] <... read resumed> "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\3405\0\0\0\0\0\0"..., 832) = 832

[pid 1238] close(8 <unfinished ...>

[pid 1237] fstat(6, <unfinished ...>

[pid 1238] <... close resumed> ) = 0

[pid 1237] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=104984, ...}) = 0

[pid 1238] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1237] mmap(NULL, 107592, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 6, 0 <unfinished ...>

[pid 1238] <... openat resumed> ) = 8

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbd8000

[pid 1238] read(8, <unfinished ...>

[pid 1237] mmap(0x7fbe8dbdb000, 73728, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x3000 <unfinished ...>

[pid 1238] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\300A\2\0\0\0\0\0"..., 832) = 832

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbdb000

[pid 1238] pread64(8, <unfinished ...>

[pid 1237] mmap(0x7fbe8dbed000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x15000 <unfinished ...>

[pid 1238] <... 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 1237] <... mmap resumed> ) = 0x7fbe8dbed000

[pid 1238] pread64(8, <unfinished ...>

[pid 1237] mmap(0x7fbe8dbf1000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x18000 <unfinished ...>

[pid 1238] <... pread64 resumed> "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbf1000

[pid 1238] pread64(8, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

[pid 1237] close(6 <unfinished ...>

[pid 1238] fstat(8, <unfinished ...>

[pid 1237] <... close resumed> ) = 0

[pid 1238] <... fstat resumed> {st\_mode=S\_IFREG|0755, st\_size=2029592, ...}) = 0

[pid 1237] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1238] pread64(8, <unfinished ...>

[pid 1237] <... openat resumed> ) = 6

[pid 1238] <... 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 1237] read(6, <unfinished ...>

[pid 1238] pread64(8, <unfinished ...>

[pid 1237] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\300A\2\0\0\0\0\0"..., 832) = 832

[pid 1238] <... pread64 resumed> "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

[pid 1238] pread64(8, <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... pread64 resumed> "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

[pid 1237] <... 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 1238] mmap(NULL, 2037344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 8, 0 <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f014000

[pid 1237] <... pread64 resumed> "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

[pid 1238] mmap(0x7fa97f036000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x22000 <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f036000

[pid 1237] <... pread64 resumed> "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

[pid 1238] mmap(0x7fa97f1ae000, 319488, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x19a000 <unfinished ...>

[pid 1237] fstat(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f1ae000

[pid 1237] <... fstat resumed> {st\_mode=S\_IFREG|0755, st\_size=2029592, ...}) = 0

[pid 1238] mmap(0x7fa97f1fc000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x1e7000 <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f1fc000

[pid 1237] <... 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 1238] mmap(0x7fa97f202000, 13920, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97f202000

[pid 1237] <... pread64 resumed> "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

[pid 1238] close(8 <unfinished ...>

[pid 1237] pread64(6, <unfinished ...>

[pid 1238] <... close resumed> ) = 0

[pid 1237] <... pread64 resumed> "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\30x\346\264ur\f|Q\226\236i\253-'o"..., 68, 880) = 68

[pid 1238] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1237] mmap(NULL, 2037344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 6, 0 <unfinished ...>

[pid 1238] <... openat resumed> ) = 8

[pid 1237] <... mmap resumed> ) = 0x7fbe8d9e6000

[pid 1238] read(8, <unfinished ...>

[pid 1237] mmap(0x7fbe8da08000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x22000 <unfinished ...>

[pid 1238] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\300\323\0\0\0\0\0\0"..., 832) = 832

[pid 1237] <... mmap resumed> ) = 0x7fbe8da08000

[pid 1238] fstat(8, <unfinished ...>

[pid 1237] mmap(0x7fbe8db80000, 319488, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x19a000 <unfinished ...>

[pid 1238] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=1369384, ...}) = 0

[pid 1237] <... mmap resumed> ) = 0x7fbe8db80000

[pid 1238] mmap(NULL, 1368336, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 8, 0 <unfinished ...>

[pid 1237] mmap(0x7fbe8dbce000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x1e7000 <unfinished ...>

[pid 1238] <... mmap resumed> ) = 0x7fa97eec5000

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbce000

[pid 1238] mmap(0x7fa97eed2000, 684032, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0xd000) = 0x7fa97eed2000

[pid 1237] mmap(0x7fbe8dbd4000, 13920, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1238] mmap(0x7fa97ef79000, 626688, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0xb4000 <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8dbd4000

[pid 1238] <... mmap resumed> ) = 0x7fa97ef79000

[pid 1237] close(6 <unfinished ...>

[pid 1238] mmap(0x7fa97f012000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 8, 0x14c000 <unfinished ...>

[pid 1237] <... close resumed> ) = 0

[pid 1238] <... mmap resumed> ) = 0x7fa97f012000

[pid 1237] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 1238] close(8 <unfinished ...>

[pid 1237] <... openat resumed> ) = 6

[pid 1238] <... close resumed> ) = 0

[pid 1237] read(6, <unfinished ...>

[pid 1238] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1237] <... read resumed> "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\300\323\0\0\0\0\0\0"..., 832) = 832

[pid 1238] <... mmap resumed> ) = 0x7fa97eec3000

[pid 1237] fstat(6, <unfinished ...>

[pid 1238] arch\_prctl(ARCH\_SET\_FS, 0x7fa97eec4100 <unfinished ...>

[pid 1237] <... fstat resumed> {st\_mode=S\_IFREG|0644, st\_size=1369384, ...}) = 0

[pid 1238] <... arch\_prctl resumed> ) = 0

[pid 1237] mmap(NULL, 1368336, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 6, 0 <unfinished ...>

[pid 1238] mprotect(0x7fa97f1fc000, 16384, PROT\_READ <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8d897000

[pid 1238] <... mprotect resumed> ) = 0

[pid 1237] mmap(0x7fbe8d8a4000, 684032, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0xd000 <unfinished ...>

[pid 1238] mprotect(0x7fa97f012000, 4096, PROT\_READ <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8d8a4000

[pid 1238] <... mprotect resumed> ) = 0

[pid 1237] mmap(0x7fbe8d94b000, 626688, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0xb4000 <unfinished ...>

[pid 1238] mprotect(0x7fa97f21f000, 4096, PROT\_READ <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8d94b000

[pid 1238] <... mprotect resumed> ) = 0

[pid 1237] mmap(0x7fbe8d9e4000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 6, 0x14c000 <unfinished ...>

[pid 1238] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8d9e4000

[pid 1238] <... mmap resumed> ) = 0x7fa97eec1000

[pid 1237] close(6) = 0

[pid 1237] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 1238] mprotect(0x7fa97f3f2000, 45056, PROT\_READ <unfinished ...>

[pid 1237] <... mmap resumed> ) = 0x7fbe8d895000

[pid 1238] <... mprotect resumed> ) = 0

[pid 1237] arch\_prctl(ARCH\_SET\_FS, 0x7fbe8d896100 <unfinished ...>

[pid 1238] mprotect(0x55f502301000, 4096, PROT\_READ <unfinished ...>

[pid 1237] <... arch\_prctl resumed> ) = 0

[pid 1238] <... mprotect resumed> ) = 0

[pid 1238] mprotect(0x7fa97f440000, 4096, PROT\_READ <unfinished ...>

[pid 1237] mprotect(0x7fbe8dbce000, 16384, PROT\_READ <unfinished ...>

[pid 1238] <... mprotect resumed> ) = 0

[pid 1237] <... mprotect resumed> ) = 0

[pid 1238] munmap(0x7fa97f405000, 55828 <unfinished ...>

[pid 1237] mprotect(0x7fbe8d9e4000, 4096, PROT\_READ <unfinished ...>

[pid 1238] <... munmap resumed> ) = 0

[pid 1237] <... mprotect resumed> ) = 0

[pid 1238] brk(NULL <unfinished ...>

[pid 1237] mprotect(0x7fbe8dbf1000, 4096, PROT\_READ <unfinished ...>

[pid 1238] <... brk resumed> ) = 0x55f503ef8000

[pid 1237] <... mprotect resumed> ) = 0

[pid 1238] brk(0x55f503f19000) = 0x55f503f19000

[pid 1237] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7fbe8d893000

[pid 1238] read(0, <unfinished ...>

[pid 1237] mprotect(0x7fbe8ddc4000, 45056, PROT\_READ) = 0

[pid 1237] mprotect(0x556552c66000, 4096, PROT\_READ) = 0

[pid 1237] mprotect(0x7fbe8de12000, 4096, PROT\_READ) = 0

[pid 1237] munmap(0x7fbe8ddd7000, 55828) = 0

[pid 1237] brk(NULL) = 0x5565549f3000

[pid 1237] brk(0x556554a14000) = 0x556554a14000

[pid 1237] read(0, Hello, my name is Kate

<unfinished ...>

[pid 1236] <... read resumed> "Hello, my name is Kate\n", 1024) = 23

[pid 1236] write(8, "\26\0\0\0", 4) = 4

[pid 1238] <... read resumed> "\26\0\0\0", 4) = 4

[pid 1236] write(8, "Hello, my name is Kate", 22 <unfinished ...>

[pid 1238] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 22

[pid 1238] <... read resumed> "Hello, my name is Kate", 22) = 22

[pid 1236] read(0, <unfinished ...>

[pid 1238] write(1, "Hll, m nm s Kt\n", 15) = 15

[pid 1238] read(0, I love you <3

<unfinished ...>

[pid 1236] <... read resumed> "I love you <3\n", 1024) = 14

[pid 1236] write(8, "\r\0\0\0", 4) = 4

[pid 1238] <... read resumed> "\r\0\0\0", 4) = 4

[pid 1236] write(8, "I love you <3", 13 <unfinished ...>

[pid 1238] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 13

[pid 1238] <... read resumed> "I love you <3", 13) = 13

[pid 1236] read(0, <unfinished ...>

[pid 1238] write(1, "I lv <3\n", 9) = 9

[pid 1238] read(0, mine

<unfinished ...>

[pid 1236] <... read resumed> "mine\n", 1024) = 5

[pid 1236] write(6, "\4\0\0\0", 4) = 4

[pid 1237] <... read resumed> "\4\0\0\0", 4) = 4

[pid 1236] write(6, "mine", 4 <unfinished ...>

[pid 1237] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 4

[pid 1237] <... read resumed> "mine", 4) = 4

[pid 1236] read(0, <unfinished ...>

[pid 1237] write(1, "mn\n", 3) = 3

[pid 1237] read(0, good

<unfinished ...>

[pid 1236] <... read resumed> "good\n", 1024) = 5

[pid 1236] write(6, "\4\0\0\0", 4) = 4

[pid 1237] <... read resumed> "\4\0\0\0", 4) = 4

[pid 1236] write(6, "good", 4 <unfinished ...>

[pid 1237] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 4

[pid 1237] <... read resumed> "good", 4) = 4

[pid 1236] read(0, <unfinished ...>

[pid 1237] write(1, "gd\n", 3) = 3

[pid 1237] read(0, big work

<unfinished ...>

[pid 1236] <... read resumed> "big work\n", 1024) = 9

[pid 1236] write(6, "\10\0\0\0", 4) = 4

[pid 1237] <... read resumed> "\10\0\0\0", 4) = 4

[pid 1236] write(6, "big work", 8 <unfinished ...>

[pid 1237] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 8

[pid 1237] <... read resumed> "big work", 8) = 8

[pid 1236] read(0, <unfinished ...>

[pid 1237] write(1, "bg wrk\n", 7) = 7

[pid 1237] read(0,

<unfinished ...>

[pid 1236] <... read resumed> "\n", 1024) = 1

[pid 1236] write(6, "\0\0\0\0", 4) = 4

[pid 1237] <... read resumed> "\0\0\0\0", 4) = 4

[pid 1236] write(6, "", 0 <unfinished ...>

[pid 1237] read(0, <unfinished ...>

[pid 1236] <... write resumed> ) = 0

[pid 1237] <... read resumed> "", 0) = 0

[pid 1236] read(0, <unfinished ...>

[pid 1237] write(1, "\n", 1) = 1

[pid 1237] read(0, <unfinished ...>

[pid 1236] <... read resumed> "", 1024) = 0

[pid 1236] close(6) = 0

[pid 1236] close(8) = 0

[pid 1236] exit\_group(0) = ?

[pid 1236] +++ exited with 0 +++

**Вывод**

В ходе выполнения лабораторной работы я научилась создавать дочерние процессы и работать с ними, а также применять каналы для их взаимодействия. Мною были написаны программы для обработки строк, вводимых пользователем, и передачи их между процессами. Я научилась работать с файлами на языке С++. После выполнения данного задания я стала лучше разбираться в принципах создания процессов, как средств группировки взаимосвязанных ресурсов, и передачи между ними данных, приобрела практические навыки в управлении процессами в ОС.