Московский Авиационный Институт

(Национальный Исследовательский Университет)

Институт №8 “Компьютерные науки и прикладная математика”

Кафедра №806 “Вычислительная математика и программирование”

Лабораторная работа №4 по курсу

«Операционные системы»

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Оценка: _____

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Постановка задачи

Необходимо реализовать две динамические библиотеки:

4	Подсчёт наибольшего общего делителя для двух натуральных чисел	Int GCF(int A, int B)	Алгоритм Евклида	Наивный алгоритм. Пытаться разделить числа на все числа, что меньше A и B.
5	Рассчет значения числа Пи при заданной длине ряда (K)	float Pi(int K)	Ряд Лейбница	Формула Валлиса

Общий метод и алгоритм решения

Использованные системные вызовы:

- **void *dlopen(const char** *filename**, int** flag**) -** загружает динамическую библиотеку, имя которой указано в строке *filename*, и возвращает прямой указатель на начало динамической библиотеки**.**
- **void *dlsym(void ***handle**, char** *symbol**) -** использует указатель на динамическую библиотеку, возвращаемую dlopen, и оканчивающееся нулем символьное имя, а затем возвращает адрес, указывающий, откуда загружается этот символ
- **int dlclose(void** *handle***)** - уменьшает на единицу счетчик ссылок на указатель динамической библиотеки *handle*.

Описание CmakeLists.txt

```
cmake_minimum_required(VERSION 3.10)

set(CMAKE_CXX_STANDARD 20)
set(CMAKE_CSS_STANDART_REQUIRED ON)

project (prog1)

add_library(Lib1 SHARED lib1/lib1.cpp)
# Создается библиотека с именем `lib1` с параметром `SHARED`, который означает, что эта библиотека может быть использована другими программами
add_library(Lib1::lib1 ALIAS Lib1)
# Создается другое имя библиотеки, которое так же может быть использовано
target_include_directories(Lib1 PUBLIC ${PROJECT_SOURCE_DIR}/Lib1)
# Создает зависимость между директорией Lib1 и библиотекой Lib1
add_executable(${PROJECT_NAME} prog1.cpp)
target_link_libraries(${PROJECT_NAME} PRIVATE Lib1::lib1)

project (prog2)

add_library(Lib1_1 SHARED lib1/lib1.cpp)
add_library(Lib1_1::lib1_1 ALIAS Lib1_1)
target_include_directories(Lib1 PUBLIC ${PROJECT_SOURCE_DIR}/Lib1)

add_library(Lib2 SHARED lib2/lib2.cpp)
add_library(Lib2::lib2 ALIAS Lib2)
target_include_directories(Lib2 PUBLIC ${PROJECT_SOURCE_DIR}/Lib2)

add_executable(${PROJECT_NAME} prog2.cpp)
target_link_libraries(${PROJECT_NAME} PRIVATE Lib1_1::lib1_1 Lib2::lib2)
```

Код программы

prog1.cpp

```
#include <iostream>
#include "./lib1/lib1.h"

void info() {
    std::cout << "Please select: K arg1, arg2" << std::endl;
    std::cout << "K - selected function from library" << std::endl;
    std::cout << "K - complete the execution" << std::endl;
    std::cout << "K = 1 - Evklid's algorithm; arg1, arg2 - numbers"
<< std::endl;
    std::cout << "K = 2 - Leibniz series; arg1 - row length" <<
std::endl;
}

int main() {
    info();
    int K, arg1, arg2;
    while (scanf("%d", &K) != EOF) {
        if (K != 1 && K != 2 && K != 0) {
            std::cout << "You can only choose '0' or '1' or '2' for
K" << std::endl;
            return 1;
        }
        if (K == 1) {
            std::cin >> arg1 >> arg2;
            int res1 = NOD(arg1, arg2);
            std::cout << "Result of Evklid's algorithm working - "
<< res1 << std::endl;
        }
        else if (K == 2) {
            std::cin >> arg1;
            float res2 = Pi(arg1);
            std::cout << "Result of Leibniz series algorithm working
- " << res2 << std::endl;
        }
        else {
            std::cout << "Bye Bye" << std::endl;
            return 0;
        }
    }
    return 0;
```

```
}
```

prog2.cpp

```
#include <iostream>
#include <dlfcn.h>
#include <stdlib.h>
#include "./lib1/lib1.h"
#include "./lib2/lib2.h"

void info() {
    std::cout << "Please select: K arg1, arg2" << std::endl;
    std::cout << "K - selected function from library" << std::endl;
    std::cout << "K = -1 - complete the execution" << std::endl;
    std::cout << "K = 0 - change the library" << std::endl;
    std::cout << "K = 1 - NOD algorithm; arg1, arg2 - numbers" <<
std::endl;
    std::cout << "K = 2 - Pi algorithm; arg1 - row length" <<
std::endl;
}

int main() {
    info();
    char* libraries[] = {"libLib1.so", "libLib2.so"};
    int selectedLibrary = 0;
    int K, arg1, arg2;
    void *cur_lib;
    cur_lib = dlopen(libraries[selectedLibrary], RTLD_LAZY);
    if (cur_lib == NULL) {
        std::cout << "Library loading error" << std::endl;
        return 1;
    }

    typedef int(*func_ptr1)(int, int);
    typedef float(*func_ptr2)(int);
    func_ptr1 NOD;
    func_ptr2 PI;

    NOD = reinterpret_cast<func_ptr1>(dlsym(cur_lib, "NOD"));
    PI = reinterpret_cast<func_ptr2>(dlsym(cur_lib, "Pi"));

    while(scanf("%d", &K) != EOF) {
        if (K != -1 && K != 0 && K != 1 && K != 2) {
```

```
            std::cout << "You can only choose '-1' or '0' or '1' or
'2' for K" << std::endl;
            return 1;
        }
        if (K == 0) {
            std::cout << "Your library has been changed" <<
std::endl;
            dlclose(cur_lib);
            selectedLibrary = 1 - selectedLibrary;
            void* cur_lib = dlopen(libraries[selectedLibrary],
RTLD_LAZY);
            if (cur_lib == NULL) {
                std::cout << "Library loading error" << std::endl;
            return 1;
            }
            NOD = reinterpret_cast<func_ptr1>(dlsym(cur_lib,
"NOD"));
            PI = reinterpret_cast<func_ptr2>(dlsym(cur_lib, "Pi"));
        }
        else if (K == 1) {
            std::cin >> arg1 >> arg2;
            int res1 = NOD(arg1, arg2);
            std::cout << "Result of NOD finding algorithm working -
" << res1 << std::endl;
        }
        else if (K == 2) {
            std::cin >> arg1;
            float res2 = PI(arg1);
            std::cout << "Result of Pi finding algorithm working - "
<< res2 << std::endl;
        }
        else {
            std::cout << "Bye Bye" << std::endl;
            return 0;
        }
    }
    return 0;
}
```

lib1.h

```
#ifndef LIB1_H
#define LIB1_H
```

```
extern "C" {
    int NOD(int a, int b);
    float Pi(int k);
}

#endif
```

lib1.cpp

```
#include "lib1.h"

int NOD(int a, int b) {
    while (a != b) {
        if (a > b) a = a - b;
        else if (b > a) b = b - a;
        else return a;
    }
    return a;
}

float Pi(int k) {
    float znam = 3.0;
    float slag;
    float sum = 1;
    int c = 0;
    for (int i = 0; i < k; i++) {
        slag = (1.0 / znam);
        c += 1;
        if (c % 2 != 0) {
            sum -= slag;
        }
        else {
            sum += slag;
        }
        znam += 2;
    }
    return sum * 4.0;
}
```

lib2.h

```
#ifndef LIB2_H
#define LIB2_H
#include <cmath>
#include <vector>

extern "C" {
    int NOD(int a, int b);
    float Pi(int k);
}

#endif
```

lib2.cpp

```
#include "lib2.h"

int NOD(int a, int b) {
    std::vector<int> container;
    int max;
    double num1 = static_cast<double>(a);
    double num2 = static_cast<double>(b);
    if (a > b) max = a;
    else if (a < b) max = b;
    else return a;
    for (int i = 1; i <= max; i++) {
        if (floor(num1 / i) == num1 / i && floor(num2 / i) == num2 /
i) {
            container.push_back(i);
        }
        i++;
    }
    int result = container[container.size() - 1];
    return result;
}

float Pi(int k) {
    float pi = 1;
    float znam = 1.0;
    float chisl = 2.0;
    for (int i = 0; i < k; i++) {
        if (i % 2 != 0) znam += 2;
        if (i % 2 == 0 && i != 0) chisl += 2;
        pi = pi * (chisl / znam);
```

```
    }
    return pi * 2.0;
}
```

Протокол работы программы

```
stepan@stepan-ASUS:~/Рабочий стол/учеба/prog 3
sem/OSI/laba4/build$ ./prog1
Please select: K arg1, arg2
K - selected function from library
K - complete the execution
K = 1 - Evklid's algorithm; arg1, arg2 - numbers
K = 2 - Leibniz series; arg1 - row length
1 243 54
Result of Evklid's algorithm working - 27
2 2000
Result of Leibniz series algorithm working - 3.14209
0
Bye Bye

stepan@stepan-ASUS:~/Рабочий стол/учеба/prog 3
sem/OSI/laba4/build$ ./prog2
Please select: K arg1, arg2
K - selected function from library
K = -1 - complete the execution
K = 0 - change the library
K = 1 - NOD algorithm; arg1, arg2 - numbers
K = 2 - Pi algorithm; arg1 - row length
1 243 54
Result of NOD finding algorithm working - 27
2 2000
Result of Pi finding algorithm working - 3.14209
0
Your library has been changed
1 243 54
Result of NOD finding algorithm working - 27
2 2000
Result of Pi finding algorithm working - 3.14082
-1
Bye Bye
```

Strace:

Первая программа:

```
stepan@stepan-ASUS:~/Рабочий стол/учеба/prog 3 sem/OSI/laba4/build$ strace -f ./prog1
execve("./prog1", ["./prog1"], 0x7ffdeb9e36b8 /* 60 vars */) = 0
brk(NULL)                               = 0x55d07dc8b000
arch_prctl(0x3001 /* ARCH_??? */, 0x7ffc8f5b3dc0) = -1 EINVAL (Недопустимый
аргумент)
mmap(NULL, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff4dfba7000
access("/etc/ld.so.preload", R_OK)      = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v3/libLib1.so", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v3", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет
такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v2/libLib1.so", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v2", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет
такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
```

sem/OSI/laba4/build/tls/x86_64/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT
(Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT
(Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/libLib1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271

\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271 \321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271 \321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/x86_64/libLib1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271 \321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/x86_64", 0x7ffc8f5b2fe0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271 \321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/libLib1.so", 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|0775, st_size=15232, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 16424, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7ff4dfba2000
mmap(0x7ff4dfba3000, 4096, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x7ff4dfba3000
mmap(0x7ff4dfba4000, 4096, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7ff4dfba4000
mmap(0x7ff4dfba5000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7ff4dfba5000
close(3) = 0
openat(AT_FDCWD, "/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271 \321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3 sem/OSI/laba4/build/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=88803, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 88803, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7ff4dfb8c000
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"..., 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) =
0x7ff4df800000
mprotect(0x7ff4df89a000, 1576960, PROT_NONE) = 0
mmap(0x7ff4df89a000, 1118208, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x9a000) = 0x7ff4df89a000
mmap(0x7ff4df9ab000, 454656, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1ab000) = 0x7ff4df9ab000
mmap(0x7ff4dfa1b000, 57344, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x21a000) = 0x7ff4dfa1b000
mmap(0x7ff4dfa29000, 10432, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7ff4dfa29000
close(3)                                = 0
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого
файла или каталога)
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\0\244;\374\204(\337f#\315I\214\234\f\256\271\32"..., 68,
896) = 68
newfstatat(3, "", {st_mode=S_IFREG|0755, 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) =
0x7ff4df400000
mmap(0x7ff4df428000, 1658880, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7ff4df428000
mmap(0x7ff4df5bd000, 360448, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1bd000) = 0x7ff4df5bd000
mmap(0x7ff4df615000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x214000) = 0x7ff4df615000
mmap(0x7ff4df61b000, 52816, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7ff4df61b000
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"..., 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) =
0x7ff4dfaa5000
mmap(0x7ff4dfab3000, 507904, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xe000) = 0x7ff4dfab3000
mmap(0x7ff4dfb2f000, 372736, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x8a000) = 0x7ff4dfb2f000
mmap(0x7ff4dfb8a000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xe4000) = 0x7ff4dfb8a000
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) =
0x7ff4dfa85000
mmap(0x7ff4dfa88000, 94208, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x3000) = 0x7ff4dfa88000
mmap(0x7ff4dfa9f000, 16384, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1a000) = 0x7ff4dfa9f000
mmap(0x7ff4dfaa3000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1d000) = 0x7ff4dfaa3000
close(3)                                = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff4dfa83000
mmap(NULL, 12288, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff4dfa80000
arch_prctl(ARCH_SET_FS, 0x7ff4dfa80740) = 0
set_tid_address(0x7ff4dfa80a10)         = 6275
set_robust_list(0x7ff4dfa80a20, 24)     = 0
rseq(0x7ff4dfa810e0, 0x20, 0, 0x53053053) = 0
mprotect(0x7ff4df615000, 16384, PROT_READ) = 0
mprotect(0x7ff4dfaa3000, 4096, PROT_READ) = 0
mprotect(0x7ff4dfb8a000, 4096, PROT_READ) = 0
mprotect(0x7ff4dfa1b000, 45056, PROT_READ) = 0
mprotect(0x7ff4dfba5000, 4096, PROT_READ) = 0
mprotect(0x55d07c026000, 4096, PROT_READ) = 0
mprotect(0x7ff4dfbe1000, 8192, PROT_READ) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024,
rlim_max=RLIM64_INFINITY}) = 0
munmap(0x7ff4dfb8c000, 88803)           = 0
getrandom("\x02\x52\xdc\xb2\xe5\xe1\x2d\x35", 8, GRND_NONBLOCK) = 8
brk(NULL)                               = 0x55d07dc8b000
brk(0x55d07dcac000)                     = 0x55d07dcac000
futex(0x7ff4dfa2977c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
```

```
newfstatat(1, "", {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0x1), ...},
AT_EMPTY_PATH) = 0
write(1, "Please select: K arg1, arg2\n", 28Please select: K arg1, arg2
) = 28
write(1, "K - selected function from libra"..., 35K - selected function from library
) = 35
write(1, "K - complete the execution\n", 27K - complete the execution
) = 27
write(1, "K = 1 - Evklid's algorithm; arg1"..., 49K = 1 - Evklid's algorithm; arg1, arg2 -
numbers
) = 49
write(1, "K = 2 - Leibniz series; arg1 - r"..., 42K = 2 - Leibniz series; arg1 - row length
) = 42
newfstatat(0, "", {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0x1), ...},
AT_EMPTY_PATH) = 0
read(0, 1 243 54
"1 243 54\n", 1024)            = 9
write(1, "Result of Evklid's algorithm wor"..., 42Result of Evklid's algorithm working - 27
) = 42
read(0, 2 2000
"2 2000\n", 1024)              = 7
write(1, "Result of Leibniz series algorit"..., 53Result of Leibniz series algorithm working -
3.14209
) = 53
read(0, 0
"0\n", 1024)                   = 2
write(1, "Bye Bye\n", 8Bye Bye
)              = 8
lseek(0, -1, SEEK_CUR)                 = -1 ESPIPE (Недопустимая операция смещения)
exit_group(0)                          = ?
+++ exited with 0 +++
```

Вторая программа:

```
stepan@stepan-ASUS:~/Рабочий стол/учеба/prog 3 sem/OSI/laba4/build$ strace -f ./prog2
execve("./prog2", ["./prog2"], 0x7ffed6377be8 /* 60 vars */) = 0
brk(NULL)                               = 0x562cf5354000
arch_prctl(0x3001 /* ARCH_??? */, 0x7fff26ae12b0) = -1 EINVAL (Недопустимый
аргумент)
mmap(NULL, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f142e980000
access("/etc/ld.so.preload", R_OK)      = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v3/libstdc++.so.6", O_RDONLY|O_CLOEXEC)
= -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v3", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет
такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v2/libstdc++.so.6", O_RDONLY|O_CLOEXEC)
= -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/glibc-hwcaps/x86-64-v2", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет
такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого
файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
```

sem/OSI/laba4/build/tls/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/tls", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271

\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или
каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT
(Нет такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/x86_64", 0x7fff26ae04d0, 0) = -1 ENOENT (Нет такого файла или
каталога)
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет
такого файла или каталога)
newfstatat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build", {st_mode=S_IFDIR|0775, st_size=4096, ...}, 0) = 0
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=88803, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 88803, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f142e96a000
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"..., 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) =
0x7f142e600000
mprotect(0x7f142e69a000, 1576960, PROT_NONE) = 0
mmap(0x7f142e69a000, 1118208, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x9a000) = 0x7f142e69a000
mmap(0x7f142e7ab000, 454656, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1ab000) = 0x7f142e7ab000
mmap(0x7f142e81b000, 57344, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x21a000) = 0x7f142e81b000
mmap(0x7f142e829000, 10432, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f142e829000
close(3)   = 0
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271

```
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого
файла или каталога)
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"..., 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\0\244;\374\204(\337f#\315I\214\234\f\256\271\32"..., 68,
896) = 68
newfstatat(3, "", {st_mode=S_IFREG|0755, 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) =
0x7f142e200000
mmap(0x7f142e228000, 1658880, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7f142e228000
mmap(0x7f142e3bd000, 360448, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1bd000) = 0x7f142e3bd000
mmap(0x7f142e415000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x214000) = 0x7f142e415000
mmap(0x7f142e41b000, 52816, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f142e41b000
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) =
0x7f142e883000
mmap(0x7f142e891000, 507904, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xe000) = 0x7f142e891000
mmap(0x7f142e90d000, 372736, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x8a000) = 0x7f142e90d000
mmap(0x7f142e968000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xe4000) = 0x7f142e968000
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) =
0x7f142e863000
```

```
mmap(0x7f142e866000, 94208, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x3000) = 0x7f142e866000
mmap(0x7f142e87d000, 16384, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1a000) = 0x7f142e87d000
mmap(0x7f142e881000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1d000) = 0x7f142e881000
close(3)                                = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f142e861000
arch_prctl(ARCH_SET_FS, 0x7f142e8623c0) = 0
set_tid_address(0x7f142e862690)         = 6418
set_robust_list(0x7f142e8626a0, 24)     = 0
rseq(0x7f142e862d60, 0x20, 0, 0x53053053) = 0
mprotect(0x7f142e415000, 16384, PROT_READ) = 0
mprotect(0x7f142e881000, 4096, PROT_READ) = 0
mprotect(0x7f142e968000, 4096, PROT_READ) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f142e85f000
mprotect(0x7f142e81b000, 45056, PROT_READ) = 0
mprotect(0x562cf473f000, 4096, PROT_READ) = 0
mprotect(0x7f142e9ba000, 8192, PROT_READ) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024,
rlim_max=RLIM64_INFINITY}) = 0
munmap(0x7f142e96a000, 88803)           = 0
getrandom("\x56\x30\x51\x81\x6e\xdd\x21\x4a", 8, GRND_NONBLOCK) = 8
brk(NULL)                               = 0x562cf5354000
brk(0x562cf5375000)                     = 0x562cf5375000
futex(0x7f142e82977c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
newfstatat(1, "", {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0x1), ...},
AT_EMPTY_PATH) = 0
write(1, "Please select: K arg1, arg2\n", 28Please select: K arg1, arg2
) = 28
write(1, "K - selected function from libra"..., 35K - selected function from library
) = 35
write(1, "K = -1 - complete the execution\n", 32K = -1 - complete the execution
) = 32
write(1, "K = 0 - change the library\n", 27K = 0 - change the library
) = 27
write(1, "K = 1 - NOD algorithm; arg1, arg"..., 44K = 1 - NOD algorithm; arg1, arg2 -
numbers
) = 44
write(1, "K = 2 - Pi algorithm; arg1 - row"..., 40K = 2 - Pi algorithm; arg1 - row length
) = 40
```

openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/libLib1.so", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0"..., 832) = 832
newfstatat(3, "", {st_mode=S_IFREG|0775, st_size=15232, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 16424, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f142e97b000
mmap(0x7f142e97c000, 4096, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x7f142e97c000
mmap(0x7f142e97d000, 4096, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f142e97d000
mmap(0x7f142e97e000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f142e97e000
close(3) = 0
mprotect(0x7f142e97e000, 4096, PROT_READ) = 0
newfstatat(0, "", {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0x1), ...},
AT_EMPTY_PATH) = 0
read(0, 1 243 54
"1 243 54\n", 1024) = 9
write(1, "Result of NOD finding algorithm "..., 45Result of NOD finding algorithm working -
27
) = 45
read(0, 2 2000
"2 2000\n", 1024) = 7
write(1, "Result of Pi finding algorithm w"..., 49Result of Pi finding algorithm working -
3.14209
) = 49
read(0, 0
"0\n", 1024) = 2
write(1, "Your library has been changed\n", 30Your library has been changed
) = 30
munmap(0x7f142e97b000, 16424) = 0
openat(AT_FDCWD,
"/home/stepan/\320\240\320\260\320\261\320\276\321\207\320\270\320\271
\321\201\321\202\320\276\320\273/\321\203\321\207\320\265\320\261\320\260/prog 3
sem/OSI/laba4/build/libLib2.so", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0"..., 832) = 832
newfstatat(3, "", {st_mode=S_IFREG|0775, st_size=28984, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 25112, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f142e979000
mmap(0x7f142e97b000, 8192, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f142e97b000

```
mmap(0x7f142e97d000, 4096, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x4000) = 0x7f142e97d000
mmap(0x7f142e97e000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x4000) = 0x7f142e97e000
close(3)                                = 0
mprotect(0x7f142e97e000, 4096, PROT_READ) = 0
read(0, 1 243 54
"1 243 54\n", 1024)                     = 9
write(1, "Result of NOD finding algorithm "..., 45Result of NOD finding algorithm working -
27
) = 45
read(0, 2 2000
"2 2000\n", 1024)                       = 7
write(1, "Result of Pi finding algorithm w"..., 49Result of Pi finding algorithm working -
3.14082
) = 49
read(0, -1
"-1\n", 1024)                           = 3
write(1, "Bye Bye\n", 8Bye Bye
)                                       = 8
lseek(0, -1, SEEK_CUR)                  = -1 ESPIPE (Недопустимая операция смещения)
exit_group(0)                           = ?
+++ exited with 0 +++
```

Вывод

В ходе выполнения данной лабораторной работы я научился работать с динамическими библиотеками 2-мя способами. В дальнейшем это пригодится мне в написании более сложных и больших программ. Во время работы вознилки некие трудности, связанные с особенностями языка C++, однако мне удалось разобраться с ними и теперь моя программа работает.