

Лабораторная работа #3
Задание 1

main.cpp

```
#include <string>
using namespace std;

extern "C" int func(int x);

int main()
{
    for (int i = 0; i < 10; i++)
    {
        printf("x = %d y(x) = %d ", i, func(i));
        printf("\n");
    }

    return 0;
}
```

func.s

```
.global func
func:
    mov 4(%esp), %eax
    sar $1, %eax
    add $1, %eax
    ret
```

результат:

```
(base) drkwdck@drkwdck:~/labs/3$ ./a.out
x = 0 y(x) = 1
x = 1 y(x) = 1
x = 2 y(x) = 2
x = 3 y(x) = 2
x = 4 y(x) = 3
x = 5 y(x) = 3
x = 6 y(x) = 4
x = 7 y(x) = 4
x = 8 y(x) = 5
x = 9 y(x) = 5
(base) drkwdck@drkwdck:~/labs/3$
```

Задание 2

```
.data
printf_format:
.string "%d\n"
.globl main
main:
movl $13, %eax
sar $1, %eax
add $1, %eax
pushl %eax
pushl $printf_format
call printf
addl $8, %esp
movl $0, %eax
ret
```

Вывод:

```
1
(base) drkwdck@drkwdck:~/labs/3$ ./a.out
7
(base) drkwdck@drkwdck:~/labs/3$
```

Задание 3

3_3.cpp

```
#include <cstdlib>
#include <ctime>

extern "C" int GetRand(int from, int to)
{
    srand(time(0));
    return std::rand() % (to - from) + from;
}
```

3_3.s

```
.data
str: .string "Rand от 1 до 10 = %d\n"
From: .int 1
To: .int 10
.global main
main:
pushl To
pushl From
call GetRand
pushl %eax
pushl $str
call printf
```

Результат нескольких вызовов:

```
6fab29d..6c1b4b3 master -> master
(base) drkwdck@drkwdck:~/labs/3$ ./a.out
Random number from 1 to 10 = 9

(base) drkwdck@drkwdck:~/labs/3$ ./a.out
Random number from 1 to 10 = 4

(base) drkwdck@drkwdck:~/labs/3$ ./a.out
Random number from 1 to 10 = 6
```

Задание 4

3_4.s

```
.data
a: .int 6
b: .int 3
str: .string "a = 3 b = 6 \nx= %d y= %d\n"
.global main
main:
pushl a
pushl b
call additional_fun
add $2*4, %esp
push %ecx
push %eax
```

```
push $str
call printf
ret
```

additional_fun.s

```
.global additional_fun
additional_fun:
mov 4(%esp), %ebx
mov 8(%esp), %eax
mov %eax, %ecx
imul %ebx, %ecx
imul %eax, %eax
imul %ebx, %ebx
sal %ecx
sub %ebx, %eax
ret
```

ВЫВОД:

```
(base) drkwdck@drkwdck:~/labs/3$ ./a.out
a = 3 b = 6
x= 27 y= 36
```

Ошибка сегментирования (стек памяти сброшен на диск)