Лабораторная работа 6.

Задание 1.

```c
#include <stdio.h>

extern "C" int func(int x, int y);

int main() {
    int x, y;
    scanf("%d %d", &x, &y);

    printf("func(%d, %d) = %d\n", x, y, func(x, y));
}
```

```
        .text
        .globl  func
        .type   func, @function
func:
        movl    %esi, %eax
        cltd
        idivl   %edi
        testl   %edx, %edx
        je      .if
        movl    %esi, %eax
        imull   %edi, %eax
        ret
.if:
        movl    %esi, %eax
        cltd
        idivl   %edi
        ret
```

```
2 4
func(2, 4) = 2
```

```
4 2
func(4, 2) = 8
```

Задание 2.

```cpp
#include <stdio.h>
#include <math.h>


extern "C" double funcc(double x);


int main() {
    double x;
    scanf("%le", &x);
    printf("funcc(%le) = %le\n", x, funcc(x));
}
```

```
        .text
        .globl  funcc
        .type   funcc, @function
funcc:
        movsd .consts(%rip), %xmm1
        ucomisd         %xmm0, %xmm1
        jnb     .if
        subsd   %xmm1, %xmm0
        ret
.if:
        pxor    %xmm0, %xmm0
        ret
.consts:
        .long   2576980378
        .long   1072273817
```

```
0.7
```

```
funcc(7.000000e-01) = 0.000000e+00
```

```
0.9
funcc(9.000000e-01) = 1.000000e-01
```

```
1
funcc(1.000000e+00) = 2.000000e-01
```

Задание 3.

```c
#include <stdio.h>
#include <math.h>


extern "C" int fib(int N, int* result);


int main() {
    int x;
    scanf("%d", &x);

    int* fibs = (int*) malloc((x + 1) * sizeof(int));

    fib(x, fibs);

    for (int i = 0; i < (x + 1); ++i) {
        printf("fib(%d) = %d\n", i, fibs[i]);
    }

    free(fibs);
}
```

```
        .text
        .globl  fib
        .type   fib, @function
```

```
fib:
        movl    $1, (%rsi)
        movl    $1, 4(%rsi)
        leal    1(%rdi), %eax
        cmpl    $2, %eax
        jle     end
        movq    %rsi, %rax
        leal    -2(%rdi), %edx
        leaq    4(%rsi,%rdx,4), %rcx
for:
        movl    (%rax), %edx
        addl    4(%rax), %edx
        movl    %edx, 8(%rax)
        addq    $4, %rax
        cmpq    %rcx, %rax
        jne     for
end:
        rep ret
```

```
6
fib(0) = 1
fib(1) = 1
fib(2) = 2
fib(3) = 3
fib(4) = 5
fib(5) = 8
fib(6) = 13
```

Задание 4.

Аналитически доказуемо, что гармонический ряд расходится, следовательно найти сумму невозможно.

```cpp
#include <stdio.h>
#include <math.h>


extern "C" bool ser(double eps, double* result);


int main() {
    double eps;
    scanf("%le", &eps);

    double res = 0;
    if (!ser(eps, &res))
        printf("the series does not converge\n");

    return 0;
}
```

```asm
      .text
      .globlser
      .type ser, @function
ser:
      movl  $0, %eax
      ret
```

0.001 the series does not converge