

Министерство образования Республики Беларусь

Учреждение образования
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
ИНФОРМАТИКИ И РАДИОЭЛЕКТРОНИКИ

Факультет компьютерных систем и сетей

Кафедра электронных вычислительных машин

Лабораторная работа № 1
«Структура программы на Си. Функции ввода-вывода»

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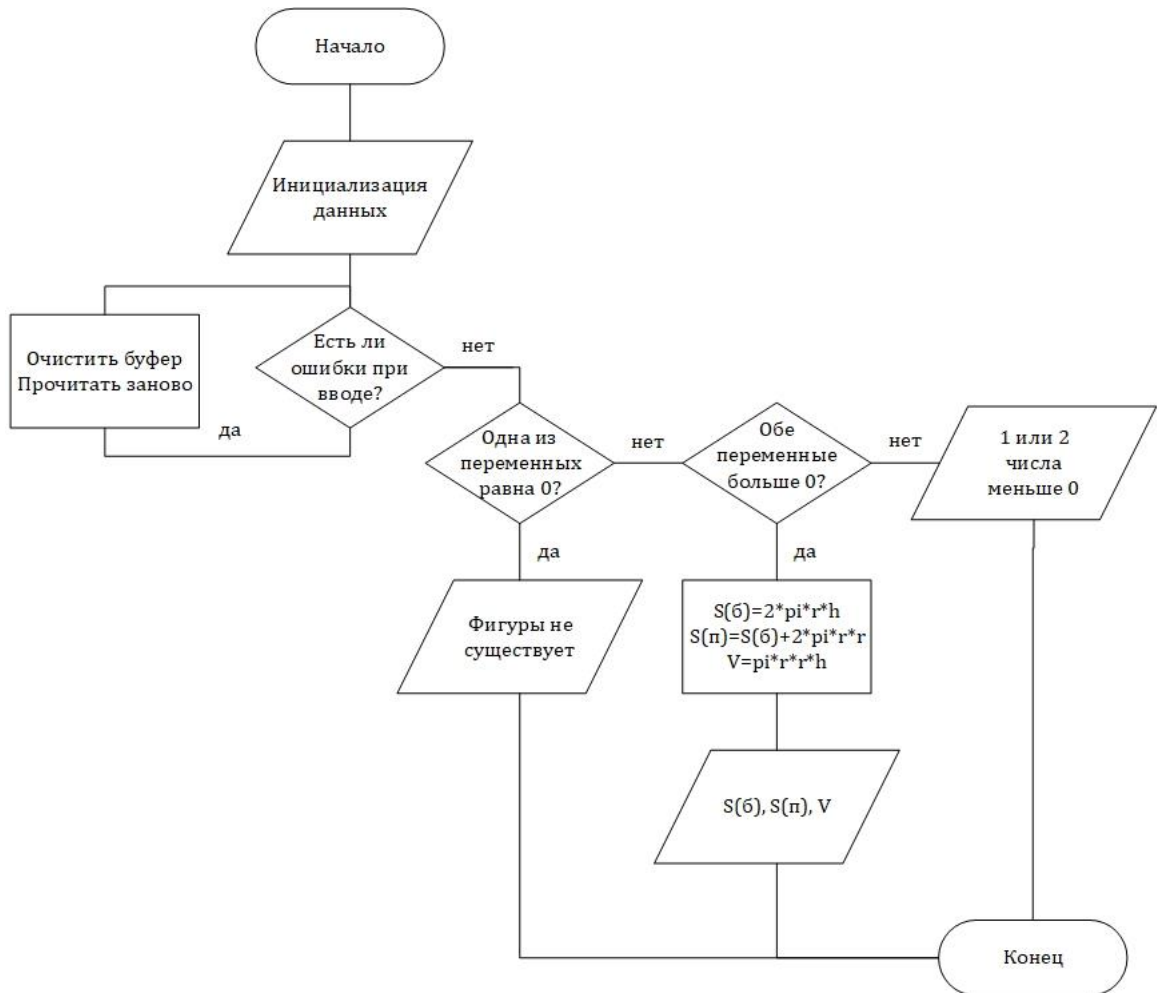
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МИНСК 2022

Задача 1

1. Ввести высоту и радиус цилиндра. Найти площадь боковой поверхности, площадь полной поверхности и объем цилиндра. Результат вывести с точностью до двух знаков после запятой.

Блок-схема:



Код программы:

```
void zadacha1()
{
    int r, h;
    double pi = 3.14159265; //задание числа пи без использования
    мат.библиотеки
    printf("Enter r, h\n");
    while (scanf_s("%i%i", &r, &h) != 2) //проверка на ввод
    {
        while (getchar() != '\n')
            continue;
        printf("Oops... Wrong input, try again\n");
    }
}
```

```

    }
    if ((r == 0) || (h == 0)) //при равенстве одной из
переменных нулю
    {
        printf("Are you sure?.. Figure does not exist\n");
        return;
    }
    else if (r > 0 && h > 0)
    {
        double S_side = 2 * pi * r * h;
        double S_total = S_side + 2 * pi * r * r;
        double V = pi * r * r * h;
        printf("S(side)=%.2lf, S(total)=%.2lf, V=%.2lf\n",
S_side, S_total, V);
        return;
    }
    else //при вводе 1 или 2 отрицательных чисел
    {
        printf("Oops... 1 or 2 of the numbers are negative\n");
        return;
    }
}

```

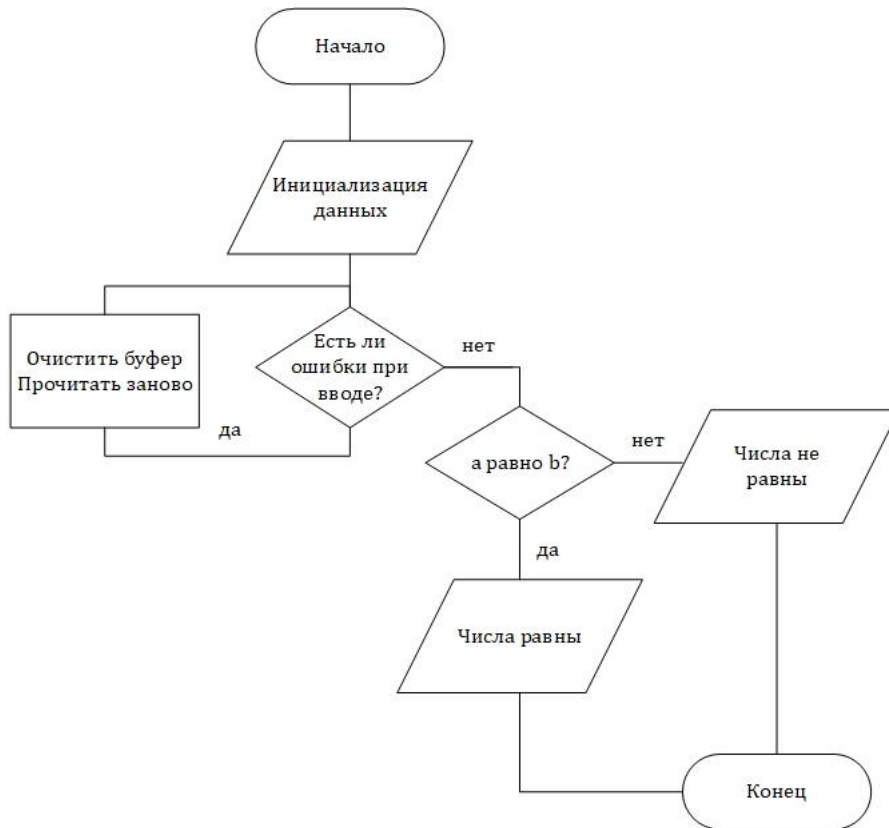
Тестирование программы:

№ теста	Вводимые данные	Ожидаемый результат	Полученный результат
1	3 3f	Oops... Wrong input, try again	Oops... Wrong input, try again
2	3f	Oops... Wrong input, try again	Oops... Wrong input, try again
3	0 33	Are you sure?.. Figure does not exist	Are you sure?.. Figure does not exist
4	33 0	Are you sure?.. Figure does not exist	Are you sure?.. Figure does not exist
5	-33 3	Oops... 1 or 2 of the numbers are negative	Oops... 1 or 2 of the numbers are negative
6	33 -3	Oops... 1 or 2 of the numbers are negative	Oops... 1 or 2 of the numbers are negative
7	33 3	S(side)=622.04, S(total)=7464.42, V=10263.58	S(side)=622.04, S(total)=7464.42, V=10263.58
8	3 33	S(side)=622.04, S(total)=678.58, V=933.05	S(side)=622.04, S(total)=678.58, V=933.05

Задача 2

1. Даны два числа a и b . Определите, равны или не равны эти числа.

Блок-схема:



Код программы:

```
void zadacha2()
{
    float a, b;
    printf("Enter a, b\n");
    while (scanf_s("%f%f", &a, &b) != 2) //проверка на ввод
    {
        while (getchar() != '\n')
            continue;
        printf("Just enter 2 numbers...\n ");
    }
    if (a == b)
        printf("Numbers are the same\n");
    else
        printf("Oh, numbers are not the same, bye-bye!\n");
}
```

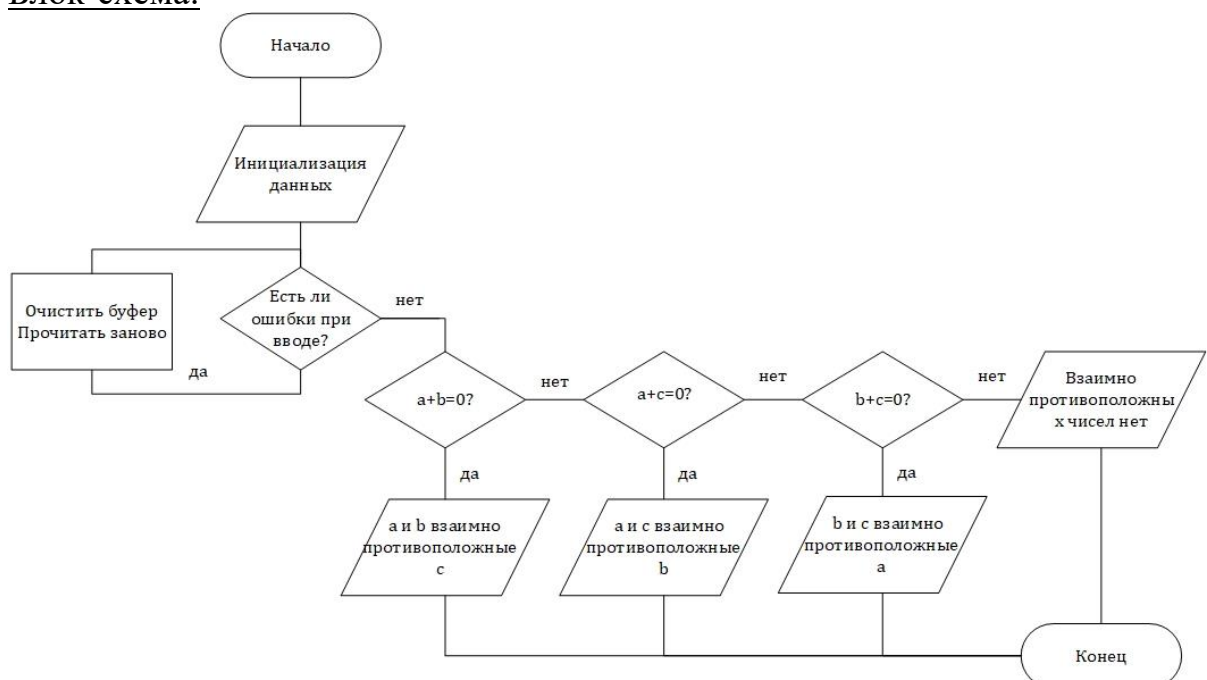
Тестирование программы:

№ теста	Вводимые данные	Ожидаемый результат	Полученный результат
1	7 7f	Just.enter.2.numbers...	Just.enter.2.numbers...
2	7f	Just.enter.2.numbers...	Just.enter.2.numbers...
3	7 77	Oh, numbers are not the same, bye-bye!	Oh, numbers are not the same, bye-bye!
4	-3 7	Oh, numbers are not the same, bye-bye!	Oh, numbers are not the same, bye-bye!
5	-7 -33.3	Oh, numbers are not the same, bye-bye!	Oh, numbers are not the same, bye-bye!
6	7.0 7	Numbers are the same	Numbers are the same
7	3.3 3.3	Numbers are the same	Numbers are the same
8	-5 -5	Numbers are the same	Numbers are the same

Задача 3

1. Если среди чисел a , b и c есть пара взаимно противоположных, вывести третье (оставшееся) число, в противном случае вывести сообщение "нет".

Блок-схема:



Код программы:

```
void zadacha3()
{
    float a, b, c;
    printf("Enter a, b, c\n");
    while (scanf_s("%f%f%f", &a, &b, &c) != 3) //проверка на
ВВОД
    {
        while (getchar() != '\n')
            continue;
        printf("Is it so hard to enter just numbers? Try again,
now.\n");
    }
    if (a + b == 0)
        printf("Those two (a and b) turned into 0, so only c=%f
survived\n", c);
    else if (a + c == 0)
        printf("Those two (a and c) turned into 0, so only b=%f
survived\n", b);
    else if (b + c == 0)
        printf("Those two (b and c) turned into 0, so only a=%f
survived\n", a);
    else
        printf("No. None of the pairs of numbers is mutually
opposite\n");
}
```

Тестирование программы:

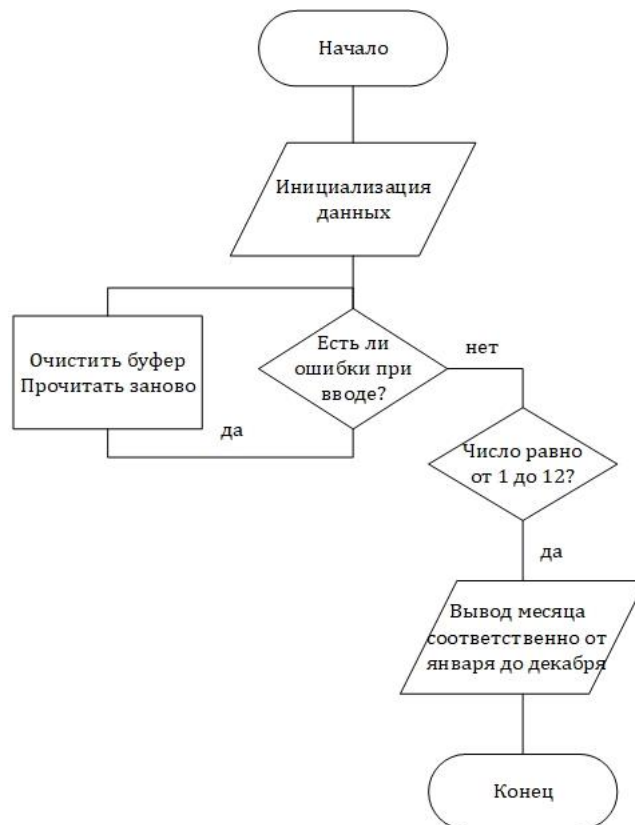
№ теста	Вводимые данные	Ожидаемый результат	Полученный результат
1	3 4 5f	Is it so hard to enter just numbers? Try again, now.	Is it so hard to enter just numbers? Try again, now.
2	1 -1 3	Those two (a and b) turned into 0, so only c=3.000000 survived	Those two (a and b) turned into 0, so only c=3.000000 survived
3	3 1 -1	Those two (b and c) turned into 0, so only a=3.000000 survived	Those two (b and c) turned into 0, so only a=3.000000 survived
4	1 3 -1	Those two (a and c) turned into 0, so only b=3.000000 survived	Those two (a and c) turned into 0, so only b=3.000000 survived
5	3.3 -3.3 5	Those two (a and b) turned into 0, so only c=5.000000 survived	Those two (a and b) turned into 0, so only c=5.000000 survived

6	34 45 56	No. None of the pairs of numbers is mutually opposite	No. None of the pairs of numbers is mutually opposite
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Задача 4

1. По номеру месяца напечатать его название.

Блок-схема:



Код программы:

```

void zadacha4()
{
    int a;
    printf("Enter the month number in the form '1', '5', '11' etc.\n");
    while (!scanf_s("%d", &a) || a < 1 || a > 12) //проверка на ввод
    {
        while (getchar() != '\n')
            continue;
        printf("Again, put the month number here\n");
    }
    if (a == 1)
        printf("Month: January (Winter) P.S. Happy New Year!!!\v");
}
  
```

```

if (a == 2)
    printf("Month: February (Winter)\v");
if (a == 3)
    printf("Month: March (Spring)\v");
if (a == 4)
    printf("Month: April (Spring)\v");
if (a == 5)
    printf("Month: May (Spring)\v");
if (a == 6)
    printf("Month: June (Summer)\v");
if (a == 7)
    printf("Month: July (Summer)\v");
if (a == 8)
    printf("Month: August (Summer)\v");
if (a == 9)
    printf("Month: September (Autumn)\v");
if (a == 10)
    printf("Month: October (Autumn)\v");
if (a == 11)
    printf("Month: November (Autumn)\v");
if (a == 12)
    printf("Month: December (Autumn)\v");
}

```

Тестирование программы:

№ теста	Вводимые данные	Ожидаемый результат	Полученный результат
1	3f	Again, put the month number here	Again, put the month number here
2	4.5	Again, put the month number here	Again, put the month number here
3	1	Month: January (Winter) P.S. Happy New Year!!!	Month: January (Winter) P.S. Happy New Year!!!
4	6	Month: June (Summer)	Month: June (Summer)

Приложение 1

Алгоритм выбора задачи:

