1- Laboratory work

You will have a total of 15 assignments. You need to complete all the assignments before the next lesson. All these assignments are graded with a maximum of 5 points.

1.

Write a program that displays two lines on a computer screen. The first line should contain your first name and the second line should contain your last name. Use the *\n* control character for newline.

2.

Write a program in which to three variables *x, y, z* assign values: 5, 17, 12.8. Print the values of the variables on the screen in a line, separating the numbers with tabulation using the *\t* (horizontal tab) character. Note that the values of the first two variables have integer values, while the third variable has a real value.

Answer:

```
x=5   y=17 z=12.8
```

3.

Write a program that calculates the value of the function *f(x)* for *x=0.5* and displays the calculated value on the computer screen.

$$f(x)=\cos x+2{,}8+|x+2|+\ln(|3x+2|);$$

Answer:

```
y= 7.43035
```

4.

Write a program that calculates the value of the function *f(x)* and displays the calculated value on the screen. The values for *t* and *s* are entered from the keyboard. $f(x)=\frac{2t+2s-\sin 1{,}17}{4{,}4-t-\sin(s-t)}$;

With the entered value:

```
t= 3
```

Answer:

```
result= 23.4173
```

5.

Write a program to find out the roots of a quadratic equation $ax^2 + bx + c = 0$.

The discriminant is determined by formula $D = \sqrt{b^2 - 4ac}$.

The roots of the equation are determined by formula $x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$.

Solve the quadratic equation $3x^2 - 14x - 5 = 0$.

With the entered values:

```
a= 3
b= -14
c= -5
```

Answer:

```
D= 256
x1= 5
x2= 0.333333
```

6. Write a program, M monkeys found N bananas and decided to divide them equally. Determine how many bananas will remain after all the monkeys have taken an equal number of bananas.

With the entered values:

M = 4 N = 10

Answer: That leaves 2 bananas

7. Write a Java program which should multiply A and B (both taken as input from keyboard) without * (use loops instead)

Input:

Enter the first number (A): 5

Enter the second number (B): 3

Output:

The result of 5 multiplied by 3 is: 15

8. Given a non-negative integer N, determine the number of tens in it (penultimate digit of the number). If there is no penultimate digit, we can assume that the number of tens is zero.A positive integer N ($0 \leq N \leq 1000000$) is given as input.
With the entered values: 73
Answer: 7
9. A three-digit integer is given. Find the sum of its digits. Input data format: A number from 100 to 999 is given as input.
With the entered values: 476
Answer:17
10. The natural number N is given as input. Output the next even number following it

Sample Input 1:
7

Sample Output 1:
8

Sample Input 2:
8

Sample Output 2:
10

11. Electronic clocks display the time in the format h:mm:ss (0:00:00 to 23:59:59), i.e. the number of hours is written down first, followed by the obligatory two-digit number of minutes, followed by the obligatory two-digit number of seconds. If necessary, the number of minutes and seconds are supplemented to the two-digit number with zeros.
N seconds have passed since the beginning of the day. Output what the clock will show.Input data format: The input is a natural number N

Sample Input 1:
3602

Sample Output 1:
1:00:02

Sample Input 2:

129700

Sample Output 2:

12:01:40

12. The values of two moments of time belonging to the same day are given: hours, minutes and seconds for each of the moments of time. It is known that the second moment of time did not occur earlier than the first. Determine how many seconds elapsed between the two moments of time. The program receives three integers as input: hours, minutes, seconds, specifying the first moment of time and three integers specifying the second moment of time.Output the number of seconds between these points in time.

Sample Input 2:

1
2
30
1
3
20

Sample Output 2:

50

13. The length of the Moscow Ring Road is 109 kilometers. Biker Vasya starts from the zero kilometer of the Moscow Ring Road and rides at a speed of V kilometers per hour. At what marker will he stop in T hours?
Input data format: The program receives integers V and T as input. If $V > 0$, Vasya moves in the positive direction along the Moscow Ring Road, and if $V < 0$, he moves in the negative direction. $0 \le T \le 1000$, $-1000 \le V \le 1000$.
Output data format: The program should output an integer from 0 to 108 - the number of the mark where Vasya will stop.

Sample Input 1:

60
2

Sample Output 1:

11

14. A four-digit number is given. Determine whether its decimal notation is symmetric. If the number is symmetric, print 1, otherwise print any other integer. The number can have less than four digits, then you should consider that its decimal notation is supplemented with non-significant zeros on the left.
Input data format: A single number is input. Output data format: Print a single integer - the answer to the problem.

Sample Input 1:

2002

Sample Output 1:

1

Sample Input 2:

2008

Sample Output 2:

37

15. A snail crawls along a vertical pole of height H meters, climbing A meters during the day and descending B meters during the night. On which day will the snail reach the top of the pole?

Input data format: The program receives as input non-negative integers H, A, B, with H > B. The numbers do not exceed 100. Output data format: The program should output one natural number. It is guaranteed that A > B.

Sample Input:

10
3
2

Sample Output:

8