**Homework: Console Input / Output**

**Problem 1. Sum of 3 Numbers**

* Write a program that reads 3 real numbers from the console and prints their sum.

*Examples:*

| **a** | **b** | **c** | **sum** |
| --- | --- | --- | --- |
| 3 | 4 | 11 | 18 |
| -2 | 0 | 3 | 1 |
| 5.5 | 4.5 | 20.1 | 30.1 |

**Problem 2. Print Company Information**

* A company has name, address, phone number, fax number, web site and manager. The manager has first name, last name, age and a phone number.
* Write a program that reads the information about a company and its manager and prints it back on the console.

*Example input:*

| **program** | **user** |
| --- | --- |
| Company name: | Telerik Academy |
| Company address: | 31 Al. Malinov, Sofia |
| Phone number: | +359 888 55 55 555 |
| Fax number: |  |
| Web site: | <http://telerikacademy.com/> |
| Manager first name: | Nikolay |
| Manager last name: | Kostov |
| Manager age: | 25 |
| Manager phone: | +359 2 981 981 |

*Example output:*

Telerik Academy

Address: 231 Al. Malinov, Sofia

Tel. +359 888 55 55 555

Fax: (no fax)

Web site: http://telerikacademy.com/

Manager: Nikolay Kostov (age: 25, tel. +359 2 981 981)

**Problem 3. Circle Perimeter and Area**

* Write a program that reads the radius r of a circle and prints its perimeter and area formatted with 2 digits after the decimal point.

*Examples:*

| **r** | **perimeter** | **area** |
| --- | --- | --- |
| 2 | 12.57 | 12.57 |
| 3.5 | 21.99 | 38.48 |

**Problem 4. Number Comparer**

* Write a program that gets two numbers from the console and prints the greater of them.
* Try to implement this without if statements.

*Examples:*

| **a** | **b** | **greater** |
| --- | --- | --- |
| 5 | 6 | 6 |
| 10 | 5 | 10 |
| 0 | 0 | 0 |
| -5 | -2 | -2 |
| 1.5 | 1.6 | 1.6 |

**Problem 5. Formatting Numbers**

* Write a program that reads 3 numbers:
  + integer a (0 <= a <= 500)
  + floating-point b
  + floating-point c
* The program then prints them in 4 virtual columns on the console. Each column should have a width of 10 characters.
  + The number a should be printed in hexadecimal, left aligned
  + Then the number a should be printed in binary form, padded with zeroes
  + The number b should be printed with 2 digits after the decimal point, right aligned
  + The number c should be printed with 3 digits after the decimal point, left aligned.

*Examples:*

| **a** | **b** | **c** | **result** |
| --- | --- | --- | --- |
| 254 | 11.6 | 0.5 | FE |0011111110| 11.60|0.500 | |
| 499 | -0.5559 | 10000 | 1F3 |0111110011| -0.56|10000.000 | |
| 0 | 3 | -0.1234 | 0 |0000000000| 3.00|-0.123 | |

**Problem 6. Quadratic Equation**

* Write a program that reads the coefficients a, b and c of a quadratic equation ax2 + bx + c = 0 and solves it (prints its real roots).

*Examples:*

| **a** | **b** | **c** | **roots** |
| --- | --- | --- | --- |
| 2 | 5 | -3 | x1=-3; x2=0.5 |
| -1 | 3 | 0 | x1=3; x2=0 |
| -0.5 | 4 | -8 | x1=x2=4 |
| 5 | 2 | 8 | no real roots |

**Problem 7. Sum of 5 Numbers**

* Write a program that enters 5 numbers (given in a single line, separated by a space), calculates and prints their sum.

*Examples:*

| **numbers** | **sum** |
| --- | --- |
| 1 2 3 4 5 | 15 |
| 10 10 10 10 10 | 50 |
| 1.5 3.14 8.2 -1 0 | 11.84 |

**Problem 8. Numbers from 1 to n**

* Write a program that reads an integer number n from the console and prints all the numbers in the interval [1..n], each on a single line.

*Note: You may need to use a for-loop.*

*Examples:*

| **input** | **output** |
| --- | --- |
| 3 | 1 |
|  | 2 |
|  | 3 |
| 5 | 1 |
|  | 2 |
|  | 3 |
|  | 4 |
|  | 5 |
| 1 | 1 |

**Problem 9. Sum of n Numbers**

* Write a program that enters a number n and after that enters more n numbers and calculates and prints their sum. *Note: You may need to use a for-loop.*

*Examples:*

| **numbers** | **sum** |
| --- | --- |
| 3 | 90 |
| 20 |  |
| 60 |  |
| 10 |  |
| 5 | 6.5 |
| 2 |  |
| -1 |  |
| -0.5 |  |
| 4 |  |
| 2 |  |
| 1 | 1 |
| 1 |  |

**Problem 10. Fibonacci Numbers**

* Write a program that reads a number n and prints on the console the first n members of the Fibonacci sequence (at a single line, separated by comma and space - ,) : 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, ….

*Note: You may need to learn how to use loops.*

*Examples:*

| **n** | **comments** |
| --- | --- |
| 1 | 0 |
| 3 | 0 1 1 |
| 10 | 0 1 1 2 3 5 8 13 21 34 |

**Problem 11.\* Numbers in Interval Dividable by Given Number**

* Write a program that reads two positive integer numbers and prints how many numbers p exist between them such that the reminder of the division by 5 is 0.

*Examples:*

| **start** | **end** | **p** | **comments** |
| --- | --- | --- | --- |
| 17 | 25 | 2 | 20, 25 |
| 5 | 30 | 6 | 5, 10, 15, 20, 25, 30 |
| 3 | 33 | 6 | 5, 10, 15, 20, 25, 30 |
| 3 | 4 | 0 | - |
| 99 | 120 | 5 | 100, 105, 110, 115, 120 |
| 107 | 196 | 18 | 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195 |