Programming Fundamentals

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ESCOLA
SUPERIOR
DE TECNOLOGIA
E GESTÃO

Informatics Engineering
Computer and Networks Security

Worksheet 1

Subject(s):

- Data types.
- Input/Output.

Part 1

1. Write a program that makes the sum of two numbers entered by the user. Present the result of the operation.
2. Correct the following program to present the average age of the 3 students.

```
Int main() {
    print('Age student 1: ');
    scanf("&d", student1);
    print('Age student 2: ');
    scanf("&d", student2);
    print('Age student 3: ');
    scanf("&d", student3);
    printf("Avg: %f", student1 + student2+ student3 / 3)
    Return 0;
}
```

3. Write a program that requests two values. The program must use them as operands for the following arithmetic operations: sum, subtraction, multiplication, and division. Present the result of the operations and test the results obtained with several cases.
4. Write a program that calculates and presents the area and perimeter of a rectangle. The dimensions must be requested to the user. Create additional programs to calculate the area of the following geometric figures: circle and triangle.
5. What is the value of the variables at the end of the program execution?

```
#include <stdio.h>
int main() {
    int a = 2, b = 4, c = 3, d;
    d = (((a = a + 1) + ++b) * c++) % (2 * c);
    printf("%d, %d, %d, %d", a, b, c, d);
    return 0;
}
```

Part 2

1. Write a program that reads a character and presents your predecessor and your successor.
2. Write a program that determines the arithmetic mean of a set of 3 values entered by the user. Considering the values entered, you should also present the weighted average considering the following weights: 20%, 30%, 50%.
3. Write a program that reads two integer values and stores them in the variables **value1** and **value2**. Swap the value of the variables and present the result. Then check if you can make this swap without creating additional variables.
4. Write a program that asks the user the price of 3 products purchased. Present the amount to be paid, considering that you should have a 10% discount over the total of products.
5. Write a program that calculates the duration (in hh:mm:ss format) of a musical album with 5 songs. The duration of each song is read in minutes and seconds.

Part 3 (optional)

1. You were contacted by the company "XPTO, Lda." for the elaboration of a program to calculate the salary of an employee, as well as the discounts and taxes resulting from this salary processing. Concepts:
    a. Basic salary: 40 euros/day.
    b. Food allowance: 5 euros/day.
    c. IRS retention: 10%.
    d. Social Security: 11% burden of the employee and 23.75% burden of the employer.

    The program must request the employee's code, and the number of days he worked that month. It should then be presented:
    a. The gross amount to be received from the salary.
    b. Total food allowance.
    c. The amount of IRS retention to be delivered to the state.
    d. Total amount to be delivered to the Social Security (both charges).
    e. Net amount to be received by the employee.