PROBLEMS - Lesson 3a: Python Basics

Problems in yellow → Assessable problems (evaluable)

The rest of the problems are of intermediate difficulty. If you have any difficulty moving from one recommended problem to the next one, do some of the problems that appear in between for more progressive learning.

Problem 1

Write a program that reads the birth year of a person and computes his/her age in 2025. Print the result. The format will be: "You will be XX years old in 2025." where XX is an integer number.

Problem 2

Write a program that checks if an input number is lower or equal to 10. Format: "The result is: X" where X is a boolean with value True if the number is <= 10, and False if it is greater than 10.

Problem 3

Write a program to know if an input number is within the open interval (0,10), which means that it does not include these endpoints (so, greater than 0 and lower than 10). Output format: "The result is: X" where X is a boolean with value True if the number is withing the interval, False otherwise

Problem 4

Write a program to know if a 2D point (x,y) is within a square of size 10 and origin (0,0). Check if these numbers are >=0 and <=10. Output format: "Result is: X" where X is a boolean with value True if the point is within the square, False otherwise.

Problem 5

Make a program that asks the user to enter the size of the side of a square. The program should calculate the area of the square and display it on the screen.

Problem 6

Make a program that calculates the price of a trip knowing that each kilometer is paid at 2 €. The program must ask the user to enter the number of kilometers of the trip via keyboard and display the final cost of the trip on the screen.

Problem 7

Make a program that converts distances from meters to kilometers. The program will ask the user what the distance in meters is, make the conversion to kilometers and show the result of the conversion by screen.

Problem 8

Write a program that converts an amount in dollars to euros. Change to be used: 1 dollar = 0.892439 euros. Format of the message: "DD dollars are EE euros" where DD and EE are two real numbers.

Problem 9

Make a program that reads an employee's initial salary and calculates the new salary as the increase of 8% over the initial salary.

Problem 10

Given an amount in banknotes of 5, 10 and 20 euros (entered by the user via keyboard) make a program that calculates and shows the total amount.

Problem 11

Write a program that reads 3 grades (real numbers) and computes the mean. Output Format: "The mean of the grades N1 N2 N3 is MM" where MM is the mean. All numbers are real.

Problem 12

Make a program that asks the user to enter the base and height of a triangle. The program must calculate the area of the triangle and display it on the screen.

Problem 13

Write a program that converts Celsius to Fahrenheit degrees (real numbers). The output format is: "CC Celsius degrees are FF Fahrenheit degrees" where CC and FF are real numbers. The formula for conversion is:

$$f = \left(\frac{9}{5}\right)c + 32$$

Problem 14

Make a program that asks the user to enter two integers via keyboard, and calculate the addition, subtraction, multiplication, and division, and display the four results.

Problem 15

Write a program that reads an integer x and computes:

a) $\frac{2}{x-4}$

b) $\frac{1+4-x}{3\cdot(x+3)}$

Show two lines “Result: XX” where XX is a real number (with decimals). Format: "Result:AA
Result: BB".

Check the result when we enter a value x that makes the denominator = 0.

Problem 16

Make a program to resolve disputes at birthday parties where cakes are to be distributed among attendees. The program must ask for the number of cakes to be distributed and the number of people attending the party to be entered by keyboard. Then indicate how many cakes each of the attendees will have and how many will be left over. Cakes must be divided into whole units (cannot be divided into parts).

Problem 17

Write a program that computes the thousand units of an input (integer) number. Output format: “The thousand units of NN are MM” where NN and MM are two integer numbers.

For example: The thousand units of 105 are 0, The thousand units of 2405 are 2, The thousand units of 134605 are 4

Problem 18

Write a program that reads the user name, surname and age (integer). Then, the program computes his/her age next year using "_" instead of blanks. The output format: "Hi_NNNN_CCCC_next_year_you_will_be_XX_years_old." where NNNN is the name, CCCC the surname and XX the age.

For example, if the user is Maria Alsina, 33 years old, the output will be:

“Hi_Maria_Alsina_next_year_you_will_be_34_years_old.”

Problem 19

Write a program that prints the ASCII code of an input character.

Problem 20

Write a program that reads an input number x (between 0 and 200) and shows the character that corresponds to this number in the ASCII table. Next, it will show the character that has the code x+1 and then x+10. A blank space will separate the three characters. Output: Three characters, separated by blank.

Problem 21

Write a program that reads three input number (x,y,z) and computes:

a) (x < 7) and ((y > z) or (7 > z))

b) ((x == 99) and (y < -5)) and ((z >= 100) or (z < 6))

c) ((9 >= x) and (13 < y)) or (-36 >= z)

Output format: "Result: A B C" where A, B and C are booleans with values True or False.