University of Zurich[UZH]

s.e.a.l. software evolution & architecture lab

Informatics I – HS18

Exercise 2

Submission Details

- **Submission Format:** ZIP file containing three .py files
- **Submission Deadline:** 12:00, Tuesday 2nd October
- The name of the ZIP file must have the following format: firstname_lastname_studentidentificationnumber_info1_exercise_2.zip, e.g. *hans_muster_12345678_info1_exercise_2.zip*.
- Your ZIP file should contain three files, `task_1.py` and `task_2_a.py`, and `task_2_b.py`. **Do not rename these files.**
- **Important:** Please follow the naming conventions very strictly, otherwise we will not be able to grade your submission.
- Please submit the assignment using OLAT, only press the **Endgültige Abgabe** button after uploading the final submission. This cannot be modified afterwards.

1 Task: Supermarket Cashier (3.5 Points)

In this task, you are the cashier of a local supermarket. You will write a program that allows you to calculate the total price of the products your customers are purchasing, including any special offers (coupons) the customers might redeem.

The goal of this task is for you to get familiar with getting input from the user, variable assignment, doing some simple calculations and printing results.

1.1 Assignment

In Listing 1 you can see a short python program. It contains the variables `price_banana`, `price_milk`, `number_of_bananas_purchased` and `number_of_milks_purchased`. These variables indicate the prices of the products and your next customer's purchase. Please do not modify this part of the code, else we will not be able to grade your submission. Your task is to define some more variables and print out some results.

```
1 # Please do not modify this part of the code!
2 price_banana = 1.5
3 price_milk = 2.0
4 number_of_bananas_purchased = 4
5 number_of_milks_purchased = 3
6
7 # Your code goes here
```

Listing 1: task_1.py

a) Create a list of variables and print messages (0.5 Points each)

Consider the following instructions:

1. Every customer has a discount coupon. The cashier asks to the customer for his coupon percentage. Store such input value in a variable called `promotion_percentage`. You can expect the input to be an integer number from 0 to 100.
2. Calculate the subtotal price of the purchase using the predefined variables (see Listing 1) and store the result in a variable named `subtotal_price`.
3. Print a message showing the subtotal price of the purchase. The message should look as follows: "The subtotal of your purchase is x", where x is the subtotal price you calculated in step 2. Don't worry about number formatting in this step.
4. Calculate the amount the customer saves using your previous results and store the result in a variable named `savings`.
5. Print a message showing the savings the customer makes. The message should look as follows: "Your savings are y", where y is the savings amount you calculated in step 4. Don't worry about number formatting in this step.
6. Calculate the total price of the purchase and store it in a variable named `total_price`.

7. Print a message showing the total price of the purchase. The message should look as follows: "The total price of your purchase is z", where z is the total price of the purchase you calculated in 6. Don't worry about number formatting in this step.

Additional instructions:

- Solve the task directly in the code file `task_1.py`. **Do not modify** the lines that are already provided, else **we will not grade your solution** at all.
- Place your code starting at line 8. Note that the instructions are intentionally broken up into very small subtasks, and **each of the instructions above corresponds to a single line of code**.
- After completing all tasks, you can test your code by executing the python file and providing different inputs (i.e. coupon percentages).

2 Task: Python Expressions (4 Points)

2.1 Assignment

a) Arithmetic Expressions and Operators (0.5 Points each)

Your task: Write the following expressions as Python code.
Example: $2 \cdot 2$ in Python code is: `2 * 2`
Important: All variables are already defined in the provided `task_2_a.py` file where you should also **write your answers**.

1. $a - \frac{b^2}{d - c * (d + d)}$
2. $13 \bmod 5$

b) Answering Questions with Python (0.5 Points each)

Your task: For the following questions, find an expression in Python which gives you the desired answer.

Important: Write each of your answers in the provided `task_2_b.py` file. Each answer should be saved in a variable named `task_n` where `n` is the index of the subtask. E.g. the solution to subtask 3 should be named `task_3`. The file `task_2_b.py` already contains already such variables for each tasks. **Do not change** the name of these variables.

You can use the links in the footnote as reference [1][2].

1. Find a Python expression that checks the following equality:
   Is $((65^{12} \ \% \ 3233)^{413}) \ \% \ 3233$ equal to 65?
   Store the result of this expression in the provided `task_1` variable (its value has to be `True`).

2. Use string slicing to split the word "doghouse" into the two separate English words "dogs" and "house". Fill the two variables accordingly.

```
1 doghouse = "doghouse"
2 task_2_p1 = # needs to contain the word "dog"
3 task_2_p2 = # needs to contain the word "house"
```

3. A palindrome is a string that reads the same backward as forward. "anna" is an example of palindrome. Write a Python expression that checks if "anna" is a palindrome. Store the result of this expression in the `task_3` variable.

4. Find a Python expression that checks if a string is part of another string using membership operators.
   You have to check whether the string "alpha" is contained in the string "alphanumeric"?
   Store the result of this expression in the provided `task_4` variable.

[1] https://www.tutorialspoint.com/python/python_basic_operators.htm
[2] https://pyformat.info/

5. Find a Python expression that when given a string creates a new string with the original string repeated multiple times:
   Given "Python is cool!" create the string "Python is cool!Python is cool!Python is cool!
   Store the result of this expression in the provided `task_5` variable.

6. The winner of a competition scored 95.66666666666667 points.
   Write a Python expression that round this value to a two decimal digits (95.67).
   Store the result of this expression in the provided `task_6` variable.
   Note: First define the variable `percentage` to be 95.66666666666667. Then find how to format the string contained in this variable to a string rounded to two digits after the decimal point.