V24 Python-Powershell inlämning 1

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Contents

1 Exercises L1

1.1 Installing python

Install Python via Anaconda (Individual Edition).
Verify that it works by opening a Console (Windows) or Terminal (mac) window and type "python". The example below is the output from Fredrik's Mac:

> Python 3.9.7 (default, Sep 16 2021, 08:50:36) [Clang 10.0.0] :: Anaconda, Inc. on darwin Type "help", "copyright", "credits" or "license" for more information.

1.2 Installing Visual Studio Code

- Download and install (VSC)
- Download and install Python extension for VSC

1.3 Setup VSC

Before we can begin programming, you should do the following:

- Create a folder named python_courses in some location in home directory,
- Create a folder named YH_Intro_Python inside python_courses
- Use VSC to open the folder YH_intro_python
- Use VSC to create a new folder named yourname_assign1 inside folder YH_Intro_Python
- Save all program files from exercises in this assignment inside the folder yourname_assign1

1.4 Create, edit and execute

Lets begin by writing a classic program. Create a file named "hallo.py" inside your assignment 1 folder and type:

```
# The classic "Hello World!" program.
print ("Hello World!")
```

Execute program by right-clicking on the program and chose: "Run Python File in Terminal"

2 L2 Input/Output, operation on primitive types

2.1 Printing

Write a program print.py, that will print the phrase: "The older you get, the better you get, unless you're a banana."

- First, write the quote on one line,
- Then write the quote on three lines,
- Then write the quote with one word on each line,
- Finally, write the quote inside a rectangle made up by the characters = and —.

2.2 Quote

Write a program quote.py that reads a line of text from the keyboard and then prints the same line as a quote (that is inside " "). An example of an execution:

> Write a line of text: Common sense is like deodorant. The people who need it most never use it.
> Quote: "Common sense is like deodorant. The people who need it most never use it."

2.3 Fahrenheit

Write a program fahrenheit.py that reads a The Fahrenheit temperature F (a float) from the keyboard and then print the corresponding Celsius temperature C.
The realtionship between C and F is:

$$F = (9/5) * C + 32. \tag{1}$$

An example of an execution:

> Provide a temperature in Fahrenheit:
> 100 Corresponding temperature in Celsius is 37.77778

2.4 5-year Interest

Write a program interest.py which computes the value of your savings S after five years given a certain interest rate P (percentage).
You can assume that both S and P are integers.
The value should be an integer correctly rounded off.
An example of an execution:

> Initial savings: 1000
> Interest rate (in percentages): 9
> The value of your savings after 5 years is: 1539

2.5 Area

Write a program area.py which reads a radius (R, a float) and computes the area A of a circle with radius R.
An example of an execution:

> Provide radius: 2.5
> Corresponding area is 19.6

The result should be presented with a single decimal correctly rounded off.

2.6 Time

Write a program time.py, which reads a number of seconds (an integer) and then prints the same amount of time given in hours, minutes and seconds. An example of an execution:

> Give a number of seconds: 9999
> This corresponds to: 2 hours, 46 minutes and 39 seconds.

Hint: Use integer division and the modulus operator.

3 L3 - If statements

3.1 Largest

Write a program largest.py which reads three integers A, B, C and then prints the largest number. For example:

```
Please provide three integers A, B, C.
Enter A: 23
Enter B: 46
Enter C: -11
The largest number is: 46
```

Notice: You should solve this problem using if statements. You are not allowed to use any of the max and sort functions that comes with Python.

3.2 Taxes

In a (very) simplified version of the Swedish income tax system we have three tax levels depending on your monthly salary:

You pay a 30% tax on all income below 38.000 SEK/month
You pay an additional 5% tax on all income in the interval 38.000 SEK/month to 50.000 SEK/month
You pay an additional 5% tax on all income above 50.000 SEK/month Write

a program tax.py which reads a (positive) monthly income from the keyboard and then prints the corresponding income tax. For example:

```
Please provide monthly income: 32000
Corresponding income tax: 9600
Please provide monthly income: 46000
Corresponding income tax: 14200
Please provide monthly income: 79000
Corresponding income tax: 27200
```

3.3 Random Number

Write a program randomsum.py generating and printing the sum of five random numbers in the interval [1,100]. For example:

```
Five random numbers: 78 13 91 2 36
The sum is 222
```

Hint: Use the function random.randint in the random module
Notice: No reading from the keyboard in this exercise

3.4 Classify Numbers

Write a program oddpositive.py which generates a random numer in the interval [-10,10] and classifies it as odd/even and as positive/negative. For example:

> The generated number is -7 -7 is odd and negative

Notice: No reading from the keyboard in this exercise

3.5 Short Name

Write a program shortname.py, reading a first name and a last name (given name and family name) as two strings.

The output should consist of the first letter of the first name followed by a dot and a space, followed by the first four letters of the last name. An example of an execution:

> First name: Anakin
> Last name: Skywalker
> Short name: A. Skyw

What happens if the last name consists of less than four letters?

4 Bonus

4.1 Sum of Three

Write a program sumofthree.py which asks the user to provide a three digit number. The program should then compute the sum of the three digits. For example:

> Provide a three digit number: 483
> Sum of digits: 15

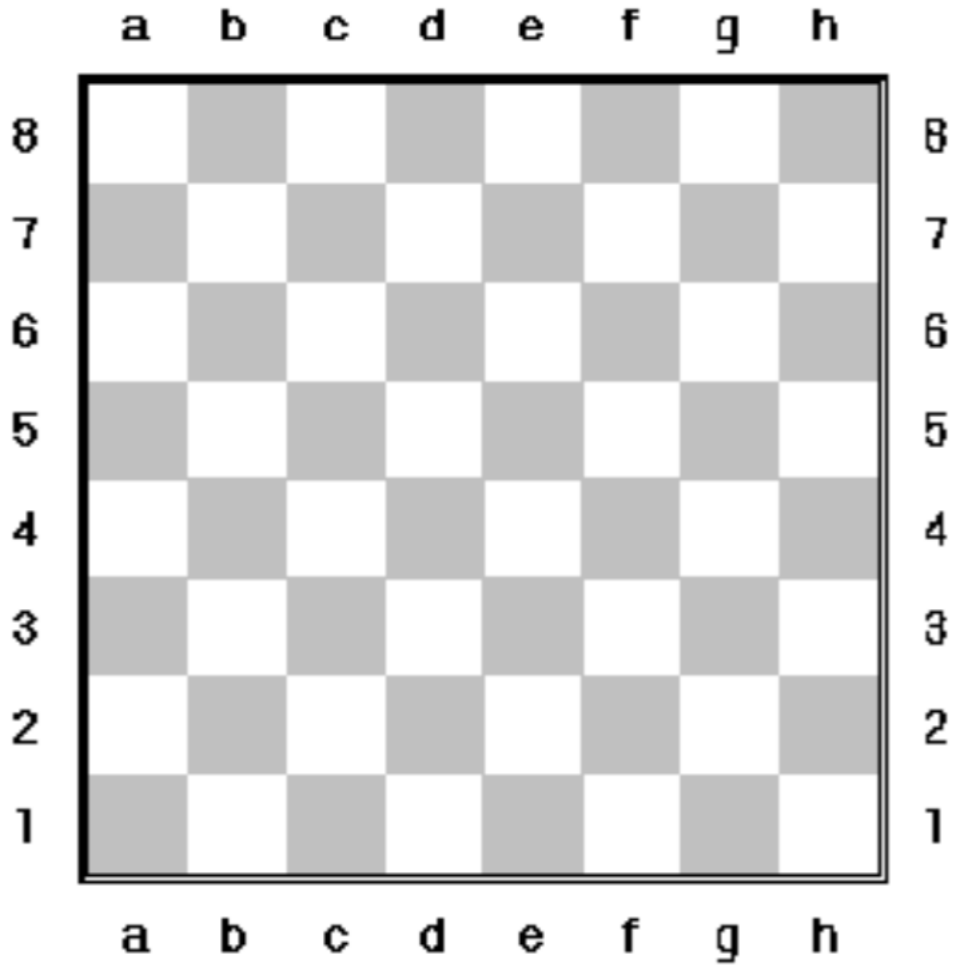
4.2 Change

Write a program change.py that computes the change a customer should receive when she/he has paid a certain sum.

The program should exactly describe the minimum number of Swedish bills and coins that should be returned rounded off to nearest krona (kr). Example:

> Price: 372.38
> Payment: 1000
> Change: 628 kr
> 1000kr bills: 0
> 500kr bills: 1
> 200kr bills: 0
> 100kr bills: 1
> 50kr bills: 0
> 20kr bills: 1
> 10kr coins: 0
> 5kr coins: 1
> 2kr coins: 1
> 1kr coins: 1

4.3 Chess Square Color



Each square on a chess board is identified by a letter (a-h) and an integer (1-8). They are typically refered to as c3 or f5. Write a program squarecolor.py that reads a square identifier (e.g. e5) from the keyboard and prints the color (Black or White).

```
Enter a chess square identifier (e.g. e5): c6
c6 is White
```