Hands-on Python – Exercises – Day 3

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Exercise 1

Remember your factorial and arithmetic mean program? What happens if you try to compute the factorial or mean of "Hello World"?
Make your program save against stupid users using exeptions.
Hints:

- Trying to turn a string, that does not represent a number, into a number raises a ValueError (there are several)
- A division can raise a ZeroDivisionError
- Trying to open a file, that doesn't exists raises a FileNotFoundError (please print the error information here!)

Exercise 2

Define a class named Rectangle. It should have:

- a class attribute `shape` defining it's a rectangle (for example a string)
- two instance attributes for its side lengths, which should be initialized in the __init__
- functions for computing its area and circumfence
- a __str__(self) function, that tells what shape it is, and whats its side lenghts

Write a program, that instanciates two Rectangles, print it and its area and circumfence.

Exercise 3

Define two subclasses of Rectangle: ColoredSquare and RightTriangle.

- ColoredSquare has an additional color value (in 8 bit color representation - 0xRRGGBB, for example 0xFF0000 for pure red or 0xFF00FF for violet), but gets only one side length when creating an instance. It has a method for printing its color.
- RightTriangle gets the same parameters as Rectangle. It has a function for computing the length of its third side (Pythagoras).
- Think about how you have to override the methods for computing the arae and circumfence in the RightTriangle class. You should not override them in the ColoredSquare class.

Exercise 4

Download the Vector class I prepared. Overload operators

- adding
- subtracting
- mulitply (dot product)

Exercise 5

Create a class called Numbers, which has a single class attribute called MULTIPLIER, and a constructor which takes the parameters x and y (these should all be numbers).

- Write a method called add which returns the sum of the attributes x and y.
- Write a class method called multiply, which takes a single number parameter a and returns the product of a and MULTIPLIER.
- Write a static method called subtract, which takes two number parameters, b and c, and returns b - c.
- Write a method called value which returns a tuple containing the values of x and y. Make this method into a property and write a setter for manipulating the values of x and y.

Exercise 6

Solve some exercises from http://codingbat.com/python.