lLaboratory 1

September 24, 2018

1 Concepts

```
- data types in Python
- operators
- expressions
- assignements
- conditional statement
```

1.1 Numbers in Python

```
- integer type
    - positive and negative numbers: 1 si -1, 2 si -2, 5, -10
- float type
    - floating poing numers: 2.4, 1.2, -1.5
    - numbers with an e: 3E2 ->3*10 at the power of 2
- mathematical operations: addition, substraction, multiplication, division (depending on the Py
- string data type: "ana", 'ana'
```

```
In [0]: #addition
```

```
In [0]: #substraction
```

```
In [0]: #multiplication
```

```
In [0]: #division
```

```
In [0]: #raise a number to power
```

We may create variables to retain values.

```
In [0]: a=5
        b=7
        a+b
```

```
Out[0]: 12
```

Conventions for variable names:

```
1. The name of the variable can not start with a number
2. Spaces can not be used in the name, but _ can be used instead
3. Can not use the symbols :'",<>/?|\()!@#$%^&*~-+
3. Best practice (PEP8) use small letters for variable names.
```

1.2 Comparison operators

Operator	Description
==	If the values of two operands are equal, then the condition is true
!=	If the values of two operands are not equal, then the condition is true.
>	If the value of the left operand is larger than the value of the right operand, then the condition is true.
<	If the value of the left operand is lower than the value of the right operand, then the condition is true.
>=	If the value of the left operand is larger or equal to the value of the right operand, then the condition is true.
<=	If the value of the left operand is lower or equal to the value of the right operand, then the condition is true.

1. Add 2 examples to test the operator == (**equal**)

```
In [0]: # == -> True
```

```
In [0]: # == -> False
```

2. Add 2 examples to test the operator != (**not equal**)

```
In [0]: # != -> True
```

```
In [0]: # != -> False
```

3. Add 2 examples to test the operator > (**greater than**)

```
In [0]: # > -> True
```

```
In [0]: # < -> False
```

4. Add 2 examples to test the operator < (**less than**)

```
In [0]: # < -> True
```

```
In [0]: # < ->False
```

5. Add 2 examples to test the operator >= (**greater than or equal to**)

```
In [0]: # >= -> True
```

```
In [0]: # >= -> False
```

6. Add 2 examples to test the operator <= (**less than or equal to**)

```
In [0]: # <= -> True
```

```
In [0]: # <= -> False
```

```
In [0]: 1<2<3
```

7. Add 2 examples to test the statement: **and**

8. Add 2 examples to test the statement: **or**

1.3 if, elif, else statements

Sintax:

```
if case1:
    action1
elif case2:
    action2
else:
    action3
```

```
In [0]: a = 5
        if a<10:
            print ("a is smaller than 10")
        else:
            print ("a is equal to 10")
```

9. Correct and explain why the following code does not work properly

```
In [0]: temperature = 23
        if temperature > 30:
            print("Outside is warm.")
            else:
                print("Outside is cold.")


          File "<ipython-input-15-429b0acc3bfd>", line 4
        else:
           ^
    SyntaxError: invalid syntax
```

10. What is the result of the following program? Explain.

```
In [0]: x = 5
        y = x == 6
        z = x == 5
        print("x=", x)
        print("y=", y)
        print("z=", z)
        if y:
            print("Fizz")
        if z:
            print("Buzz")
```

11. Create a program that will enable you to compute your final grade at "Programming I". Formula:

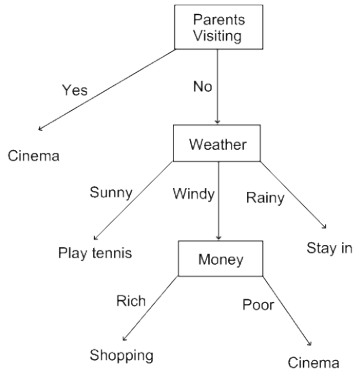
$labTest = (test1 + test2 + test3 + test4)/4$
$finalMark = 40\%examMark + 20\%labTest + 20\%activCourseLab$

12. Create a programm that allows you to calculate the BMI (Body Mass Index) of a person. The body mass index is calculated using the formula: $BMI = \frac{mass(kg)}{height^2}$. The value obtained is interpreted in the following way:

IBM Value	Interpretation
< 18,5	High risk: the waight is to low
18,5-24,9	Minimim/ Low risk
25-22,9	Low/Medium risk
30-34,9	Medium/High risk
>35	High risk: the waight it to high

The programm will read the mass and height of a person and will return the information in wich chategory in wich the person is.

13. Write a program that asks you the following questions (Figure 1) and gives a recomandation what to do.



Problem 12. Decision Tree

14. Create a simple quiz and number how many corecct answers are given by the user.

Quiz Content
This is first laboratory for course "Programming 1"?
True
Correct!
What is the coorect answer for (2+3)*2-6?
5
Incorrect!
Hows face is on 10 Ron bill?
1) George Enescu

Quiz Content
2) Nicolae Iorga 3) Nicolaie Grigorescu 4) Aurel Vlaicu 3 Correct! The quiz has finished you answerd correct 2 questions

2 Supplimentary exercises

1. Write a program that verifies if a number is odd or not.
2. Write a program that display if person P1 is younger, older or has same age with person P2. For each person the program receives the day, mounth and year of birth.
3. What does the following code print to the console?

```
if 5 > 10:
    print("fan")
elif 8 != 9:
    print("glass")
else:
    print("cream")
```

4. Write a program to solve quadratic equations (use if, else if and else).
5. Take three numbers from the user and print the greatest number.
6. Write a Java program that keeps a number from the user and generates an integer between 1 and 7 and displays the name of the weekday.
7. Write a program that reads in two floating-point numbers and tests whether they are the same up to three decimal places.