LAB #2 - Exercises

1. Write a program that declares and multiplies two integer variables (4, 15), then print out the result on the screen.

- Input: 4 and 15
- Expected output:

```
The result is: 60
```

2. Check the type of different variables using the function `type`.

- Input:

```
a = 2
b = 3
c = a
char = 'a'
string_value = "hello"
bool_value = True
float_value = 2.3
```

- Expected output:

```
<class 'int'>
<class 'int'>
<class 'int'>
<class 'str'>
<class 'str'>
<class 'bool'>
<class 'float'>
```

3. Which is the value of `a` ?

```
a = 2*3+1
print(a)
a = (2*3)+1
print(a)
a = 2* (3+1)
print (a)
a = 2*3**2+1
print(a)
a = 2*(3**2)+1
print (a)
a = (2*3)**2+1
print(a)
```

4. Write a program that asks the temperature in Farenheit and prints out the temperature in Celsius.
   $T(C) = (T(F) - 32) * 5/9$

- Input: 100
- Expected output:

```
Temperature in Celsius is 37.77777777777778
```

5. Write a program to swap the values of two variables.

- Input: a = 2, b = 3
- Expected output:

```
a = 3 b = 2
```

6. Write a program to calculate the thermical sensation.

$$T_s = 13,12 + 0,6215 * T - 11,37 * V^{0,16} + 0,3965 * T * V^{0,16}$$

- Input: t = 10.0, v = 5.0
- Expected output:

```
Temperature = 10.0
Velocity = 5.0
Thermal sensation  = 9.755115709161835
```

7. Write a program to calculate the values r and theta required to transform cartesian coordinates to polar.

- $r = \sqrt(x2 + y2)$
- $\theta = tan^{-1}(y/x)$
- Input: x = 2, y = 3
- Expected output:

```
r     = 3.605551275463989
theta = 0.982793723247329
```

8. Write a program that calculates the roots following the quadratic formula:

- $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
- Use the function `math.sqrt(x)`
- Input: a = 4, b = 5, c = 1
- Expected output:

```
The roots are:
-0.25
-1.0
```

9. Write and check the difference between 1/3 and 1//3?

```
1/3
```

```
1//3
```

10. Write and check the result of comparing 5 == "5".

```
5=="5"
```

11. Write a program to test the **augmented assignment**. What is the result of the following program?

```
a = 2
a += 3
print(a)
a *= 2
print(a)
```

12. Write a program to calculate the area of a circle of radius r.

- Use the constant `math.pi`
- Input: r = 3
- Expected output:

```
28.274333882308138
```

13. Write a program that asks the user for an integer numbers and prints out a message indicating whether the input is greater than 10.

- Input: 15
- Expected output:

```
The input 15 is greater than 10.
```

14. Write a program that asks the user for two integer numbers and prints out the greater value.

- Input: 4 and 15
- Expected output:

```
The result is: 15
```

15. Write a program that asks the user for an integer number and prints the absolute value of the input value. Do not use the built-in function abs()

- Input: -3
- Expected output:

```
The absolute value of -3 is 3.
```

16. Write a program that asks the user for two float numbers and prints out the greater value.

- Input: 3.5, 4.5
- Expected output:

```
4.5 is greater than 3.5
```

17. Write a program that asks the user for 3 integer numbers and prints out the greater value.

- Input: 4, 6, 2
- Expected output:

```
6 is the greatest value.
```

18. Write a program that asks the user for an integer number, and prints out whether or not it is an even number.

- Input: 4
- Expected output:

```
4 is an even number.
```

19. Write a program that asks the user for a day number an prints the day name.

- Input: between 1-7
- Expected output:

```
Monday-Tuesday-etc.
```

20. Write a program to create a new list such that the new list should contain odd numbers from the given list:

- Input: [10, 20, 25, 30, 35]
- Expected output:

```
[25, 35]
```

21. Write a Program to extract each digit from an integer in the reverse order:

- Input: 7536
- Expected output:

```
6
3
5
7
```

22. Print the following pattern. Use: `print(number, end=" ")`

- Expected output:

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

23. Draw the pseudocode of the previous exercise.
24. Draw the pseudocode of the factorial algorithm.