

Lab 2 - Getting Started with Python II

Chapter	1. Introduction to Computers, Programs, and Python	Lab
Time	80 Minutes	2

Objectives

- To familiarize with the programming environment.
- To write simple programs.

Current Lab Learning Outcomes (LLO)

By completion of the lab the students should be able to

- Use the programming environment.
- Use *print* function.
- Write simple programs that include simple calculations.
- Document the code.

Lab Requirements

• PyCharm (IDE).



Practice Activities with Lab Instructor (25 minutes)

Problem 1

Programming Exercises (1.5)

Write a program that displays the result of the following equation:

$$\frac{9.5 \times 4.5 - 2.5 \times 3}{45.5 - 3.5}$$

-

0.8392857142857143

Solution

Phase 1: Problem-Solving Phase:

- 1- Decompose the equation (Step 1):
 - \circ From:

$$\frac{9.5 \times 4.5 - 2.5 \times 3}{45.5 - 3.5}$$

• **To:**

- Note: in Python, (/) means division sign and (*) multiplication sign.
- 2- Decompose the equation (Step 2):
 - \circ From:

• **To:**

$$((9.5 * 4.5) - (2.5 * 3)) / (45.5 - 3.5)$$

3- Print the decomposed equation.

- Note: do not treat it as a string (do not enclose it with quotation marks)
- o print(((9.5 * 4.5) (2.5 * 3)) / (45.5 3.5))



Phase 2: Implementation Phase:

- 1. Open PyCharm.
- 2. Then, click on "New Project".
- 3. Then, name it "Lab 2".
- 4. Then, the new project is created and opened. After that, you have to create a new Python file inside the project to write the code on it.
- 5. Select the project name on the left menu, right click on it and select "New" \rightarrow "Python File".
- 6. Then, name the new file "activity_1", and click on "*Python file*".
- 7. Now, the new file is created and opened. Write the code in it:

```
activity 1.py
```

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8. To run the file, right click on any area of the editor and click on (Run 'activity_1'), which is the name of the file.

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9. After that, PyCharm is going to run the file using the Python interpreter, and then display the output of the file to you.

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Problem 2

Programming Exercises (1.7)

 π can be computed using the following formula:

$$\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \cdots \right)$$

Write a program that displays the result of $\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11}\right)$



2.9760461760461765 3.017071817071818

Solution

Phase 1: Problem-Solving Phase:

- 1- Decompose the first equation:
 - a. From:

$$4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11}\right)$$

b. To:

4 * (1 - (1/3) + (1/5) - (1/7) + (1/9) - (1/11))

2- Decompose the second equation:

a. From:

$$4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \frac{1}{13} - \frac{1}{15}\right)$$

b. To:

$$4 * (1 - (1/3) + (1/5) - (1/7) + (1/9) - (1/11) + (1/13) - (1/15))$$

3- Print the first decomposed equation.

a. print $(4 \times (1-(1/3)+(1/5)-(1/7)+(1/9)-(1/11)))$

4- Print the second decomposed equation.
 a. print (4 * (1-(1/3)+(1/5)-(1/7)+(1/9)-(1/11)+(1/13)-(1/15)))

Phase 2: Implementation Phase:

- 1. Open the project "Lab 2" if it was not opened.
- 2. Create a new file and name it "activity_2.py".

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3. Write the following code in the file:

```
activity 2.py
1  # Displays the result of the first equation
2  print(4 * (1-(1/3)+(1/5)-(1/7)+(1/9)-(1/11)))
3
4  # Displays the result of the second equation
5  print(4 * (1-(1/3)+(1/5)-(1/7)+(1/9)-(1/11)+(1/13)-(1/15)))
```



4. Run the code:



Individual Activities (50 minutes)

Problem 3

Programming Exercises (1.6)

Write a program that displays the result of 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9.

Problem 4

Programming Exercises (1.8)

Write a program that displays the area and perimeter of a circle that has a radius of 5.5 using the following formulas (Note: π = 3.14159):

 $area = radius \times radius \times \pi$ $perimeter = 2 \times radius \times \pi$



95.0330975 34.55749



Extra Exercises (Homework)

From the Textbook

- Programming Exercises:
 - o **1.10**
 - o **1.11**

From MyProgrammingLab (<u>https://pearson.turingscraft.com</u>)

- 1.5
 - o **60155**
 - o **60156**
- 1.8
 - o **60169**
 - o **60170**
 - o **60183**

Upload Your Solutions

Upload your solutions of the lab activities to Blackboard.

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