**Lab Exercise 2. Variables, assignment, types and operators**

1. What is a Python comment? How do you indicate a comment? What purpose does it serve?

Comments in Python are the lines in the code that are ignored by the compiler during the execution of the program.

To indicate a comment is (#) shash

Comments can appear on a new line or at the end of an existing line of code. Comments are used to explain how code works and for testing purposes

1. What is a namespace in Python?

A namespace is a system that has a unique name for each and every object in Python.

**3.** Whitespace:   
  
(a) When does whitespace matter?  
(b) When does whitespace not matter?

**4.** Mixed operations:

(a) What type results when you divide an integer by a float? A float by an integer?

Float   
(b) Explain why that resulting type makes sense (as opposed to some other type).

**5.** Consider integer values of a, b, and c and the expression (a + b) \* c. In mathematics, we can substitute square brackets, [ ], or curly braces, { }, for parentheses, ( ). Is that same substitution valid in Python? Try it.

**a = 88**

**b = 100**

**c = 5**

**print(a + b \* c)**

**6.** Which of the following are acceptable variable names for Python?

(a) xyzzy

(b) 2ndVar

(c) rich&bill

(d) long name

(e) good2go

**7.** Give the values printed by the following program for each of the labeled lines.

int\_a = 27

int\_b = 5

int\_a = 6

print(int\_a) *# Line 1*

print(int\_b + 5) *# Line 2*

print(int\_b) *# Line 3*

1. What is printed by Line 1?

Print 27

1. What is printed by Line 2?
2. Print 10
3. What is printed by Line 3?
4. 5

**8.** Give the values printed by the following program for each of the labeled lines, and

answer the associated questions.

a\_float = 2.5

a\_int = 7

b\_int = 6

print(a\_int / b\_int) *# Line 1*

print(a\_int // a\_float) *# Line 2*

print(a\_int % b\_int) *# Line 3*

print(int(a\_float)) *# Line 4*

print(float(a\_int)) *# Line 5*

1. Line 1: What is printed? What is its type?

1.1666666666666667 float

(b) Line 2: What is printed? What is its type?

2.0 float

(c) Line 3: What is printed? What is its type?

1 integers

(d) Line 4: What is printed? What is its type?

2 integers

1. Line 5: What is printed? What is its type?

7.0 float

**9.** Give the values printed by the following program for each of the labeled lines.

a\_int = 10

b\_int = 3

c\_int = 2

print(a\_int + b\_int \* c\_int) *# Line 1*

print( (a\_int + b\_int) \* c\_int ) *# Line 2*

print(b\_int \*\* c\_int) *# Line 3*

1. What is printed by Line 1?

16

1. What is printed by Line 2?

26

1. What is printed by Line 3?

9

**10.** Change the program below to calculate and print the area of a rectangle instead.

**from** math **import** pi

r = 12

area = pi \* r \*\* 2

print(**"The area of a circle with radius"**, r, **"is"**, area)

w = float(input('Please Enter the Width of a Rectangle: '))

h = float(input('Please Enter the Height of a Rectangle: '))

# calculate the area

Area = w \* h

print("\n Area of a Rectangle is: %.2f" %Area)

**11.** Write a Python program that prompts for a number. Take that number, add 2, multiply by 3, subtract 6, and divide by 3. You should get the number you started with.

**12.** Assignment:

my\_int = 5  
my\_int = my\_int + 3  
print(my\_int)

1. If you execute the three lines of code, what will be printed? Explain your answer using the rules of assignment.

It will print out 8 because you have to add my int which is 5 +3 which equal 8   
(b) Rewrite my\_int = my\_int + 3 using the += symbol.

**13.** Assignment:

my\_var1 = 7.0  
my\_var2 = 5  
print(my\_var1 % my\_var2)

If you execute these three lines of code, what will be printed?

Print 2.0 is floats

**14.** Prompt for input and then print the input as a string, an integer, and a float-point value. What values can you input and print without errors being generated?

**15.** Consider the expression (a + b) \* c , but with string values for a, b, and c. Enter that into the Python shell. What happens? Why?

**16.** (Integer operators) One way to determine whether an integer is even is to divide the number by 2 and check the remainder. Write a three-line program that prompts for a number, converts the input to an integer, and prints a 0 when the number is even and a 1 when the number is odd.  
  
**17.** Body mass index (BMI) is a number calculated from a person’s weight and height. According to the Centers for Disease Control and Prevention, the BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual-energy X-ray absorptiometry. The formula for BMI is

weight / height²

where weight is in kilograms and height in meters.

1. Write a program that prompts for metric weight and height and outputs the BMI.

height = float(input("Enter height in meters: "))

weight = float(input("Enter weight in kg: "))

# the formula for calculating bmi

bmi = weight/(height\*\*2)

# \*\* is the power of operator i.e height\*height in this case

print("Your BMI is: {0} and you are: ".format(bmi), end='')

#conditions

if ( bmi < 16):

print("severely underweight")

elif ( bmi >= 16 and bmi < 18.5):

print("underweight")

elif ( bmi >= 18.5 and bmi < 25):

print("Healthy")

elif ( bmi >= 25 and bmi < 30):

print("overweight")

elif ( bmi >=30):

print("severely overweight")  
(b) Write a program that prompts for weight in pounds and height in inches, converts  
the values to metric, and then calculates the BMI.