**Lab Exercise 3. More Python basics**

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

A comment is used to explain what the program is doing/what you are trying to accomplish. A single line comment is written using the # symbol, a multi-line comment is written using triple apostrophes (i.e. ‘’’ Comment here ‘’’)

**2.** What is a namespace in Python?

The table that contains the association of a name and a value

**3.** Whitespace:  
  
(a) When does whitespace matter? – Leading whitespace i.e. defining indentation or for readability.  
(b) When does whitespace not matter? – In expressions and on blank lines.

**4.** Mixed operations:

(a) What type results when you divide an integer by a float? – The result is a float, done so as not to lose any information. i.e. 12 / 2.3 = 5.217391304347826  
A float by an integer? – The result is also a float, same reason as above. i.e. 6.022 / 2 = 3.011

(b) Explain why that resulting type makes sense (as opposed to some other type). – This is done so as not to lose any information.

**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.

No we cannot:

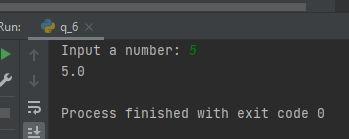
[ ] represent lists

{ } represent dictionaries

**6.** 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.

my\_var\_str = input("Input a number: ")  
my\_var\_int = float(my\_var\_str)  
  
add\_2 = my\_var\_int+2  
multi\_3 = add\_2 \* 3  
sub\_6 = multi\_3 - 6  
div\_3 = sub\_6/3  
  
my\_calc = div\_3  
print(my\_calc)

Output:



**7.** Assignment:

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

(a) If you execute the three lines of code, what will be printed? Explain your answer using the rules of assignment. – It will print the integer 8. This is because the value of my\_int is set to 5 in line 1, but this value is then overwritten in line 2 with the value of 8.

(b) Rewrite my\_int = my\_int + 3 using the += symbol.

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

**8.** 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? – 2.0. This is printed as a float because my\_var1 is defined as a float in line 1.

**9.** 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?

user\_var = input("Please input a character: ")  
  
print(str(user\_var))  
print(int(user\_var))  
print(float(user\_var))

Integers print as all 3 types.  
Floats cannot be printed as an integer  
Letters cannot be printed as an integer or a float

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

It throws up an error because you cannot multiply strings. Only addition and subtraction work on strings.

**11.** (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 if the number is even and a 1 if the number is odd.

user\_str = input("Enter an integer to check if it is even: ")  
user\_int = int(user\_str)  
print(user\_int % 2)

**12.** 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.

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