Algorithms & Data Structures

Lab 2 (Fundamentals of Programming in Python)

EX1:

```
# Type conversion
number = float(input('Enter your number: '))
print('number:', number, type(number))
number = int(number)
print('number:', number, type(number))
number = str(number)
print('number:', number, type(number))
```

EX2:

```
# Find the summation and average
# of three integer numbers
number1 = int(input("Enter your first number: "))
number2 = int(input("Enter your second number: "))
number3 = int(input("Enter your third number: "))
sum = number1+number2+number3
average = sum / 3
print('Sum=', sum)
print('Average=', average)
```

EX3:

```
# Math library
from math import *
x = 5.8765
print('round', round(x))
print('round', round(x, 2))
print('floor', floor(x))
print('ceil', ceil(x))
print('pow', pow(2, 5))
print('abs', abs(-7))
print('factorial', factorial(5))
print('sqrt', sqrt(9))
```

EX4:

```
# Convert from and to ASCII
num1=102
num2='a'
print(chr(num1))
print(ord(num2))
```

EX5:

```
# Boolean type variables
num1, num2 = 5, 8
num3 = num1 > num2
print('num3 =', num3)
num4 = num1 < num2
print('num4 =', num4)
print(num3 and num4)
print(num3 or num4)
```

EX6:

```
# find the result of the following expression
# result= ((5-2)*3^2)//2
result = ((5-2)*3**2)//2
print('result=', result)
```

Exercises:

1. Open a Python shell, enter the following expressions, and observe the results:

a. 8 b. 8 * 2 c. 8 ** 2 d. 8/12 e. 8 // 12 f. 8/0

2. Let the variable x be "dog" and the variable y be "cat". Write the values returned by the following operations:

a. x + y

b. "the " + x + " chases the " + y

c. x * 4

3. Which of the following are valid variable names?

a. length

b. _width

c. firstBase

d. 2MoreToGo

e. halt!

4. Let x =8 and y =2. Write the values of the following expressions:

a. x + y * 3

b. (x + y) * 3

c. x ** y

d. x % y

e. x / 12.0

f. x // 6

5. Let x =4.66 Write the values of the following expressions:

a. round(x) b. int(x)

6. Write Python code to achieve the following tasks:

a. calculate and print the number of minutes in a year.

b. takes the radius of a sphere (a floating-point number) as input and then outputs the sphere's diameter, circumference, surface area, and volume.

c. calculate the total amount of a meal purchased at a restaurant. The program should ask the user to enter the charge for the food, then calculate the amounts of an 18 percent tip and 7 percent sales tax. Display each of these amounts and the total.