Part 1

Evaluate the following Boolean expressions in **IDLE**:

Note down the response to each. Do they differ from what you would expect?

```
7 and 5
True and True
True and False or True
False or False and True
False or 0
not (False) and True
not (True or not (False and False))
(10 > 14) and (4 == 5)
True and 5
(3 * 4)! = (14 - 2) or ('C' >= 'D')
(12 * 2) == (3 * 8)
(14 * 2)! = (3 * 8)
```

```
print(7 and 5)
print(True and True)
print(True and False or True)
print(False or False and True)
print(False or 0)
print(not (False) and True)
print(not(True or not(False and False)))
print((10 > 14) and ( 4 == 5))
print(True and 5)
print((3*4)!=(14-2)or('c'>='d'))
print((12*2)==(3*8))
print((14*2)!=(3*8))
```

Output:

```
5
True
True
False
0
True
False
False
5
False
True
True

Process finished with exit code 0
```

Part 2

1. Evaluate the following expressions for `num1 = 10` and `num2 = 20`.

(a) `not (num1 < 1) and num2 < 10`
(b) `not (num1 < 1) and num2 < 10 or num1 + num3 < 100`
(c) `not (num2 > 1) or num1 > num2 - 10`

```
num1=10
num2=20
print(not(num1<1) and num2<10)
print(not (num1 < 1) and num2 < 10 or num1 + num2 < 100)
print(not(num2>1)or num1>num2-10)
```

Output:

```
False
True
False

Process finished with exit code 0
```

2. Write a python program to find the sum and product of two numbers.

```
num1=int(input("enter the first number: "))
num2=int(input("enter the second number: "))
sum= num1+num2
product=num1*num2
print("the sum of the number is: ", sum)
print("the product of the number is: ", product)
```

Output:

```
enter the first number: 2
enter the second number: 3
the sum of the number is:  5
the product of the number is:  6


Process finished with exit code 0
```

3. Write a python program to input first name, last name, and address. Print them.

```
fname="Naeema"
lname="Thing"
address= "Hetauda-04, Nepal"
print ("the first name is: ", fname)
print ("the last name is: ", lname)
print ("the address is: ", address)
```

Output:

```
the first name is:  Naeema
the last name is:  Thing
the address is:  Hetauda-04, Nepal
```

4. Write a python program to input three numbers and find their sum.

```
num1=int(input("enter the first number: "))
num2=int(input("enter the second number: "))
num3=int(input("enter the third number: "))
sum=num1+num2+num3
print("the sum of the given three numbers: ", sum)
```

Output:

```
enter the first number: 4
enter the second number: 6
enter the third number: 8
the sum of the given three numbers:  18


Process finished with exit code 0
```

5. Write a python program to print the area of circle. Take radius of circle as an input form the user.

```
radius=int(input("enter the value of radius: "))
pi=3.14
Area =3.12*radius*radius
print("the area of circle is: ", Area)
```

Output:

```
enter the value of radius: 5
the area of circle is:  78.0

Process finished with exit code 0
```

Part 3

1. Write a program that:

(a) Asks to input the user's weight in kilograms

(b) Asks to input the user's height in centimeters.

(c) Calculates the BMI (Body Mass Index).

[BMI=weight in kilograms / square of height in centimeters]

(d) Prints the user's BMI.

```python
weight=int(input("enter the weight in kilogram: "))
height=int(input("enter the height in centimeter: "))
BMI=weight/(height*height)
print("the user's BMI is: ", BMI)
```

```
P3.1 ×

 C:\Users\HP\AppData\Local\Microsoft\WindowsApps\python3.
 enter the weight in kilogram: 47
 enter the height in centimeter: 168
 the user's BMI is:  0.001665249433106576


 Process finished with exit code 0
```

2. An observer sees the shadow of a bird at mid-day.

(a) The distance between the observer and the shadow is 15 meters.

(b) The perpendicular distance between the bird and its shadow is 25 meters.

(c) Find the total distance between the bird and the observer.

[Use height and distance formula: $h^2=p^2+b^2$]

```
import math
p = 15
b = 25
h_squared = p**2 + b**2
h = math.sqrt(h_squared)
print ("the distance between observer and bird is: ", h)
```

P3.2 ×

```
C:\Users\HP\AppData\Local\Microsoft\WindowsApps\python3.10.exe "
the distance between observer and bird is:  29.154759474226502

Process finished with exit code 0
```

3. A costumer walks in a flower shop and finds the following menu:

Particulars	White Roses	Lilies	Poppies	Marigold	Red Roses
Per piece	50	50	40	20	100
Per bouquet	300	300	250	200	1000

If the user bought a bouquet of lilies and four red roses, find the total money the user spent in the flower shop.

```
a=300 #cost of bouquet of lilies
b=100 #cost of per red rose
totalmoney=a+(b*4)
print("the total money that the user spent in the flower shop", totalmoney)
```

```
P3.3 ×
 C:\Users\HP\AppData\Local\Microsoft\WindowsApps\python3.10.exe "C:\Users\H
 the total money that the user spent in the flower shop 700

 Process finished with exit code 0
```

4. Take user's name, age and address as input and generate a formatted output using python scripting. [Use %d and %s to generate the output]

```
name=input("enter your name: ")                                    A 8
age=input("enter your age: ")
address=input("enter the address: ")
output ="name:%s, age:%d, address:%s"%(name,int(age),address)
print(output)
```

P3.4 ×

```
enter your name: Naomi Thing
enter your age: 19
enter the address: hetauda
name:Naomi Thing, age:19, address:hetauda

Process finished with exit code 0
```

5. Calculate the VAT amount of a gadget the user bought using the built in python format function within two decimal digits. Input the cost price from the user. [VAT =13%]

```
cp=int(input("enter the cost price of the gadget: "))
VATrate=(13/100)
VATamt=cp*VATrate
print("the total amount of this gadget: ", VATamt)
print("VAT amount: {:.2f}".format(VATamt))
```

```
P3.5 ×
C:\Users\HP\AppData\Local\Microsoft\WindowsApps\pyth
enter the cost price of the gadget: 1200
the total amount of this gadget:  156.0
VAT amount: 156.00

Process finished with exit code 0
```

Part 4 (Home Task)

1. Give an appropriate if statement for each of the following
   (The value of num is not important):

(a) Displays 'within range' if num is between 0 and 100, inclusive.

(b) Displays 'within range' if num is between 0 and 100, inclusive, and displays 'out of range' otherwise.

2. Rewrite the following if-else statements using a single if statement and elif:

```
if temperature >= 85 and humidity > 60:
    print ('muggy day today')
else:
    if temperature >= 85:
```

```
                print ('warm, but not muggy today')
            else:
                if temperature >= 65:
                    print ('pleasant today')
                else:
                    if temperature <= 45:
                        print ('cold today')
                    else:
                        print ('cool today')
```

3. Write a Python program in which:

(a) The user enters either `'A'`, `'B'`, or `'C'`. If `'A'` is entered, the program should display the word `'Apple'`; if `'B'` is entered, it displays `'Banana'`; and if 'C' is entered, it displays `'Coconut'`. Use nested if statements for this.

(b) Repeat question **(a)** using an if statement with `elif` headers instead.

(c) A student enters the number of college credits earned. If the number of credits is greater than or equal to 90, 'Senior Status' is displayed; if greater than or equal to 60, 'Junior Status' is displayed; if greater than or equal to 30, 'Sophomore Status' is displayed; else, 'Freshman Status' is displayed.

(e) The user enters a number. If the number is divisible by 3, the word 'Fizz' should be displayed; if the number is divisible by 5 the word 'Buzz' should be displayed and if the number is divisible by both 'FizzBuzz' should be displayed.

5. Create a program using the schematic below to help you decide whether it is okay to eat something that you dropped on the floor…

Note: this is not genuine advice on health and hygiene ;)