AIMS- Cameroon 2021 - High School Students Mentorship

May 14, 2021

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1.1 DAY 1 - INTRODUCTION TO PYTHON

1.1.1 What is Python ?

Python is an open source programming language that was made to be easy to read and powerful.

It is the most widely used programming language in the world today.

The easier a programming language is to manipulate, the higher level it is said to be.

1.1.2 Hello world...

This is the common way to start with a programming language, depending on the programming language. For instance, for an Arduino board, this "Hello world..." is equivalent to turning on a led.

1.1.3 Small exercise

Display "Hello world..." on your programming interface. To do it, you will need the command line : print(".")

[3]:
```
print("Hello World…")
```

```
Hello World…
```

1.1.4 ARITHMETIC

Arithmetic in python is easy and simple to handle.

Practice :

[4]:
```
2+7
```

[4]: 9

[5]:
```
7-2
```

[5]: 5

[6]:
```
7*2
```

[6]:
```
14
```

[7]:
```
7/2
```

[7]:
```
3.5
```

The % symbol in Python is called the Modulo Operator. It returns the remainder of the remainder of a division problem.

[8]:
```
7%2
```

[8]:
```
1
```

1.1.5 Entering numerical values

In order to enter numerical values, the command line : input(“.”)

Practice:

[10]:
```
a = input("Enter the value of a = ")
```

```
Enter the value of a = 10
```

1.1.6 PRACTICAL EXERCISE

Let be the following second order equation :

$ax^2 + bx + c = 0$

Write a program that asks you to enter the values of a, b and c following the given order.

1.1.7 Solution

[11]:
```
a = input("Enter the value of a = ")
```

```
Enter the value of a = 1
```

[12]:
```
b = input("Enter the value of b = ")
```

```
Enter the value of b = 2
```

[13]:
```
c = input("Enter the value of c = ")
```

```
Enter the value of c = 3
```

1.1.8 Conditions in python

On the second line, we have converted the value of a to decimal. We will see the variable types in our next sessions.

[17]:
```
a = input('Enter the value of a: ')
a=float(a)
if a < 0 :
```

```
    print('You are negative, you have to be optimistic')
else :
    print('Good you are positive, you will suceed')
```

```
Enter the value of a: 14
Good you are positive, you will suceed
```

1.1.9 PRACTICAL EXERCISE

Let us go back to our equation of seond order.

$ax^2 + bx + c = 0$

Write down a program which solves this equation after asking to enter in order the values a, b and c and print the solution in the best way.

[48]:
```
a=input('a =') # We enter the value of a
a=float(a)
b=input('b =') # We enter the value of b
b=float(b)
c=input('c=') # We enter the value of c
c=float(c)
disc=b*b-4*a*c # We calculate delta, the discriminant, as a function of a, b␣
 ↪and c
print ("discriminant= ",disc) # Here we can print the value of the discriminant

##First condition
if disc <0:
    print("No solution") # When the discriminant is negative, there are no␣
 ↪solutions

##Second condition
if disc ==0:
    x=-b/2*a   #When the discriminant is equal to 0, there is a unique solution␣
 ↪X
    print("we have one solution, x= ",x)

##Third condition
if disc >0:
    x1=(-b-disc**0.5)/2*a
    x2=(-b+disc**0.5)/2*a
    print ("We have two solution, x1 = ",x1) # When the discriminant is␣
 ↪positive, we have x1, x2.
    print ("and, x2 = ",x2)
print('End of the programme, thank you!')
```

```
a =1
b =2
c=-3
```

```
discriminant=  16.0
We have two solution, x1 =  -3.0
and, x2 =  1.0
End of the programme, thank you!
```

1.1.10 Exercises to do for the next session

1.1.11 Exercise 1

Write a program which computes :

- The perimeter of a rectangle
- The volume of a sphere by taking = 3.14

1.1.12 Exercise 2

Write a program that displays a menu of food and asks the customer to make a choice and displays the customer's choice.

[ ]: