Session 1 :

Here is the summary of our session:

1. Python is a high-level programming language.

2. It is an interpreted language. (C and C++ are compiler languages). We will learn about it in more detail in future.

3. Python has four basic types of variables:

    a. integer: to hold/store integer values like 10, 20, 4523, -30, -43

    b. float: to hold/store decimal point values like 10.25, 321.4561, -98.21

    c. string: to hold/store strings/words/sentences like "Chinchwad", "Omkar" , "Tanaji Nagar" , "Hello World"

    d. boolean : to hold bool values True or False.

Here are code snippet for your reference:

print("Hello World")

int\_number = 10  
decimal\_num = 10.25  
string\_name = "Let us learn Python Programming"  
boolean\_true = True  
  
print(int\_number)  
print(decimal\_num)  
print(string\_name)  
print(boolean\_true)  
  
type(boolean\_true)

number1 = 10  
number2 = 20  
result = number1 / number2  
print(result)  
type(result)

Session 2:

Here is the summary of the session:

1. Computer block diagram :

     a. Keyboard and mouse are input devices to accept values. Monitor and printer are output devices to display/print output.

     b. CPU is the central processing unit and it is the brain of a computer (For example Intel CPU i5 core) which actually performs computing tasks.

     c. Main memory/RAM is a random access memory which is used to store values/programs/instructions which are used by CPU to perform tasks.

     d. Secondary memory/Hard drive/USB drive are used to store files/programs/output permanently.

2. Variables are used to store values and variables can be reused in programming to perform certain functions.

      For example :   number1 = 10  ---> here "number1" is an integer variable and it is storing the whole number value 10

                               number2 = 10.345 ---> here "number2" is a float variable and it is storing the decimal number value 10.345

                               name = "Chinchwad" ----> here "name" is a string variable and it is storing the string value "Chinchwad"

3. input() : it is a function to accept values from the keyboard and by default it stores the values as "string".

4. type() : it is a function to know the type of variable like "int", "float", "string" or "boolean"

5. for loop : It is used to perform repeated calculations or tasks.

6. range : it is a function which gives values between starting number and ending number. Starting number is included and ending number excluded.

    For example :

              range(1,11) will return 10 values 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. Note that 11 is not included.

              range(1,10) will return 9 values 1, 2, 3, 4, 5, 6, 7, 8, and 9. Note that 10 is not included.

              range(7) will return 7 values 0, 1, 2, 3, 4, 5, and 6. Note that 7 is not included. As the starting number is not provided, the range starts by default with 0.

Exercise 1 :  Use print() statement to print various english  like (Z, C, N etc).. letters as shown below.

print("  ############     ")  
print("  ##                         ")  
print("  ##                         ")  
print("  ##                         ")  
print("  ##                         ")  
print("  ########             ")  
print("  ##                         ")  
print("  ##                         ")  
print("  ##                         ")  
print("  ##                        ")  
print("  ############    ")

Exercise 2: Write a program using the following code to calculate the area of a circle. Use float values instead of integers.

number1 = int(input("Enter first number :"))  
print(type(number1))  
number2 = int(input("Enter second number :"))  
print(type(number2))  
result = number1 / number2  
print("Addition of number is " , result)  
print(type(result))

Exercise 3: Use following code to accept Name, Address, Phone number, School name. Use the print statement to beautify the output.

first\_name = input("Enter first name :")  
  
surname = input("Enter surname :")  
  
full\_name = first\_name + surname

print("Welcome" , full\_name)

For example : Output should look like below : Use your imagination and creativity to make it more beautiful.

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#####         School Name                 ######  
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Exercise 4:  Following program will display table of 2.

Here " i " will receive values between 1 to 10 from a range() function one by one.

for i in range(1,11):  
    result = 2 \* i  
    print("2 \*" , i , "=" , result)

Modify the above program to accept any integer value using input() function and print tables of it.

First diagram is for the " if " condition and the second diagram illustrates how the " for " loop works.

Session 3:

Here is a summary of today's session.

1. For loop pseudo code : Try to do it with Pen and paper to understand it.

    result = 1

     i = 1  
    Begin:  
         result = 2 \* i         
         print(result)  
          i = i + 1           
          if  i < 11  
              go to Begin:  
         else  
             go to end:  
  
end:  
    print("end program")

2. Below for loop print the table of 2: Try with different values like 5, 14, 45.

   for i in range(1,11):

          result = 2 \* i        
          print(result)

3. For loop to print number in a range: Try different ranges like range(10,100) or range(101, 501) etc... Range return return one number at a time into variable "i"

    for i in range(4,11):

           print(i)

4. Strings in python are stored as a series of characters.

   name = "Python Program"  
   # len() function returns the length of a function  
   print("Length of string", len(name))  
  
   # below for loop will also count the number of characters stored in the name variable. It is a emuation of len() function.  
    length = 0  
    for char in name:  
         length = length + 1  
          print(char, ":", length)  
  
print("Length of string", length)

5.  len() function which returns the length of a string is also used to limit the message.

review = input("Enter review : ")  
review\_len = len(review)

#Here we are checking whether the entered string has more than 50 characters or not.

# if the number of characters exceeds 50 characters, it will display the message.       
if review\_len > 50:  
    print("Only 50 characters are allowed. You have entered", review\_len, "characters")

6. Below is to showcase how string formatting is performed in python. This kind of programs are used in automated emails

salutation = input("Mr. Mrs. Ms.     :")  
first\_name = input("Enter first name : ")  
last\_name = input("Enter Surname     : ")  
  
# f ' ' is used to format the string. Syntax {variable name} is used to replace variable name with its value.  
mesg = f'Hello, {salutation.title()} {first\_name.upper()} {last\_name.upper()} \n\tThank you for registration. Welcome to Python Course'  
#print("Hello", salutation.title(), first\_name.upper(), last\_name.upper(), "\n\tThank you for registration. Welcome to Python Course"  )  
print(mesg)

7. Exercise :  try upper(), lower(), title(), len() function on strings.

Session 4:

Here is the summary of the session 4 :

1. **Subscript/Index :**In python Strings are stored as each character one after another. It's like joining characters together.

       # "A"   "m"  "i"   "t"  
      #  [0]    [1]   [2]  [3]  --> Subscript / index  
      String "Amit" is like "A" is stored at 0th position, "m" is stored at 1st position, "i" is stored at "2" position and "t" is stored at 3rd position.

      In programming languages these positions are called subscripts or indices. Also note that, in Python, C, C++ and Java (or many other languages),

                 position or subscript or index always start with 0 (Zero).

name = input("Enter name : ")  
# "A"   "m"  "i"  "t"  
#  [0]  [1]  [2]  [3]  --> Subscript  
  
#name.title()  
# variable\_name[subscript\_number]  
print(name[0])  
print(name[1])  
print(name[2])  
print(name[3])  
print("\n")  
  
print("Using 'in' construct")  
for char in name:  
    print(char)  
     
print("\nUsing subscript and length")  
print("Length : ", len(name))  
  
for sub in range(len(name)):  
    print(sub, name[sub])

2.  **Swapping of 2 numbers:**

**Solution 1 :**Using 3 variables. It is like transferring coffee and tea using a third cup.  
a = 10  
b = 20  
print("before swap")  
print("a :", a)  
print("b :", b)  
c = a  
a = b  
b = c  
print("\nafter swap")  
print("a :", a)  
print("b :", b)  
  
**Solution 2:** Using 2 variables. Here we use the magic of maths.   
a = 10  
b = 20  
print("before swap")  
print("a :", a)  
print("b :", b)  
a = a + b      
b = a - b      
a = a - b    
  
print("\nafter swap")  
print("a :", a)  
print("b :", b)

3. **Conditional operators :**Conditionals operators are used to check one value with another. We use these operators in conditional statements such as "if"

      > (greater than), >= (greater than equal to), < (less than), <= (less than equal to), != (not equal to) , == (equal to)

      Conditional expressions always return True (1) or False (0) boolean values

**For example:**     
3 == 3                   will return True  
"amit" == "Amit"   will return False (case sensitive)  
"Omkar" == "Omkar" will return True  
3 > 5  will return False  
3 >= 3   will return True  
4 < 2     will return False

4. **Operator precedence :**  Top (Highest priority) to bottom (Lowest priority)

( )    brackets    
\*\*    power of.  2 raised to 3 (2 \*\* 3)  
\* % / //    
+ -   
  
There are some more operators which we will learn as we progress.    
Try using  : See the difference in answer :   
                   20 + 29 % 2 - 2 \*\* 3 + 4 // 2 - 5  
                  (20 + 29) % 2 - 2 \*\* 3 + 4 // (2 - 5)

5. **if else condition :** if...else is a conditional statement which is used to make decisions.   
        if  Traffice-Jam        (If there is a Traffice-Jam i.e. in programming language if Traffice-Jam is True then drive on road A)           
            print("Drive on road A")  
       else:                          (If there is no Traffice-Jam i.e. in programming language else Traffice-Jam is False then drive on road B)        
           print("Drive on road B")  
   
        if number is even:  
            print("Number is even")  
        else:  
            print("Number is odd")  
  
        **Try this :   
           Example 1:**  
  
            name = "AmiT"  
            name2 = "AMit"

            if name.title() == name2.title():

     print("equal")  
else:

                print("not equal")  
  
          **Example 2:**

name = "AmiT"

            name2 = "AMit"

            if name == name2

     print("equal")

else:

                print("not equal")  
  
            **Example 3:**

num1 = int(input("Enter first number : ")   
num2 = int(input("Enter Second number : ")   
  
if num1 == num2:  
      print("num1 is equal to num2" )

           if num1 > num2:

     print("num1 is greater than num2" )

else:

                  print("num1 is less than num2" )

 if num1 <= num2:  
        print("num1 is less than equal to num2" )  
else:

       print("num1 is greater than num2" )

**Excercises :**1.  Solve the equation :    y = 4x + 5z + 6 where x = 2 and z = 8  
2.  Solve the equation (a+b)2 :   a \*\* 2 + 2 \* a \* b + b\*\*2.    where a = 4 and b = 10

3. Write a program to convert fahrenheit to celsius.  
       °C = (°F - 32) × 5/9